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**RAJIV GANDHI UNIVERSITY**



# **CURRICULUM, TEACHING AND EVALUATION**

**BA (Pass)**  
Third Year  
Paper – III

# **CURRICULUM, TEACHING AND EVALUATION**

**BA [Pass]**

**Third Year**

**Paper - III**



**RAJIV GANDHI UNIVERSITY**  
Arunachal Pradesh, INDIA - 791 112

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## About the University

Rajiv Gandhi University (formerly Arunachal University) is a premier institution for higher education in the state of Arunachal Pradesh and has completed twenty-five years of its existence. Late Smt. Indira Gandhi, the then Prime Minister of India, laid the foundation stone of the university on 4th February, 1984 at Rono Hills, where the present campus is located.

Ever since its inception, the university has been trying to achieve excellence and fulfill the objectives as envisaged in the University Act. The university received academic recognition under Section 2(f) from the University Grants Commission on 28th March, 1985 and started functioning from 1st April, 1985. It got financial recognition under section 12-B of the UGC on 25th March, 1994. Since then Rajiv Gandhi University, (then Arunachal University) has carved a niche for itself in the educational scenario of the country following its selection as a University with potential for excellence by a high-level expert committee of the University Grants Commission from among universities in India.

The University was converted into a Central University with effect from 9th April, 2007 as per notification of the Ministry of Human Resource Development, Government of India.

The University is located atop Rono Hills on a picturesque tableland of 302 acres overlooking the river Dikrong. It is 6.5 km from the National Highway 52-A and 25 km from Itanagar, the State capital. The campus is linked with the National Highway by the Dikrong bridge.

The teaching and research programmes of the University are designed with a view to play a positive role in the socio-economic and cultural development of the State. The University offers Undergraduate, Post-graduate, M.Phil and Ph.D. programmes. The Department of Education also offers the B.Ed. programme.

There are fifteen colleges affiliated to the University. The University has been extending educational facilities to students from the neighbouring states, particularly Assam. The strength of students in different departments of the University and in affiliated colleges has been steadily increasing.

The faculty members have been actively engaged in research activities with financial support from UGC and other funding agencies. Since inception, a number of proposals on research projects have been sanctioned by various funding agencies to the University. Various departments have organized numerous seminars, workshops and conferences. Many faculty members have participated in national and international conferences and seminars held within the country and abroad. Eminent scholars and distinguished personalities have visited the University and delivered lectures on various disciplines.

The academic year 2000-2001 was a year of consolidation for the University. The switch over from the annual to the semester system took off smoothly and the performance of the students registered a marked improvement. Various syllabi designed by Boards of Post-graduate Studies (BPGS) have been implemented. VSAT facility installed by the ERNET India, New Delhi under the UGC-Infonet program, provides Internet access.

In spite of infrastructural constraints, the University has been maintaining its academic excellence. The University has strictly adhered to the academic calendar, conducted the examinations and declared the results on time. The students from the University have found placements not only in State and Central Government Services, but also in various institutions, industries and organizations. Many students have emerged successful in the National Eligibility Test (NET).

Since inception, the University has made significant progress in teaching, research, innovations in curriculum development and developing infrastructure.

# SYLLABI-BOOK MAPPING TABLE

## Curriculum, Teaching and Evaluation

Syllabi	Mapping in Book
<b>Unit-I: Concept of Curriculum</b> <ul style="list-style-type: none"><li>- Meaning, Nature and Scope of Curriculum</li><li>- Principles of Curriculum Development</li><li>- Bases of curriculum; Philosophical, Psychological and Sociological</li><li>- Core curriculum</li></ul>	<b>Unit 1: Concept of Curriculum</b> (Pages 3-37)
<b>Unit-II: Curriculum Development</b> <ul style="list-style-type: none"><li>- Process of Curriculum Development</li><li>- Formulation of Objectives</li><li>- Selection of Content</li><li>- Content Analysis</li><li>- Learning Experiences</li></ul>	<b>Unit 2: Curriculum Development</b> (Pages 39-54)
<b>Unit-III: Curriculum Framework and Policies</b> <ul style="list-style-type: none"><li>- Curriculum at Different Levels: National, State and Local</li><li>- National Curriculum Framework - its Features</li><li>- National Curriculum Framework for Teacher Education (NCFTE-2009)</li><li>- Curriculum Evaluation: Nature, Steps, Tools and Techniques</li></ul>	<b>Unit 3: Curriculum Framework and Policies</b> (Pages 55-99)
<b>Unit-IV: Teaching Learning Process</b> <ul style="list-style-type: none"><li>- Concept of Teaching</li><li>- Structure of Teaching</li><li>- Functions of Teaching</li><li>- Principles of Teaching</li><li>- Models of Teaching: Elements of Teaching of Model, and Bruner's Concept Attainment Model</li></ul>	<b>Unit 4: Teaching Learning Process</b> (Pages 101-124)
<b>Unit-V: Approaches of Teaching</b> <ul style="list-style-type: none"><li>- Difference between Method and Approach of Teaching</li><li>- Methods of Teaching: Analytic Cum Synthetic Method, Demonstration Method, Project, Play Way Method</li><li>- Approaches of Teaching and Learning: Personalized System of Instruction (PSI), Computer Assisted Instruction (CAI)</li></ul>	<b>Unit 5: Approaches of Teaching</b> (Pages 125-136)
<b>Unit-VI: Teaching Aids</b> <ul style="list-style-type: none"><li>- Meaning and Significance of Teaching Aids</li><li>- Types of Teaching Aids</li><li>- Characteristics of Good Teaching Aids</li><li>- Edgar Dale's Cone of Experience</li><li>- Improvised Teaching Aids.</li></ul>	<b>Unit 6: Teaching Aids</b> (Pages 137-152)
<b>Unit-VII: Educational Evaluation</b> <ul style="list-style-type: none"><li>- Concept of Educational Measurement and Evaluation</li><li>- Types of Evaluation Procedure</li><li>- Continuous and Comprehensive Evaluation (CCE)</li><li>- Examination Reforms</li></ul>	<b>Unit 7: Educational Evaluation</b> (Pages 153-170)



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**Unit-IX: Tools and Techniques of Evaluation**  
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- Questionnaire, Observation and Interview  
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## INTRODUCTION

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Teaching, learning and evaluation are aspects of the curriculum for which teachers take responsibility. Having a shared understanding of these aspects is important. Curriculum development in historical perspective is both timeless and context dependent.

As a process, curriculum development is a contribution by the curriculum field that has stretched into all aspects of university life and indeed culture generally. Curriculum development is timeless because it deals with how to take knowledge of any kind and connect it with a group of students located in time and space. As long as institutions exist for the purpose of schooling, the practice of curriculum development, in some form or another, will persist. Although meanings for curriculum development have shifted during the past 90 years, the idea that curriculum development implies the preparation and transmission of knowledge within an institution whose purpose is to educate has remained consistent.

The term "evaluation" generally applies to the process of making a value judgment. In education, the term "evaluation" is used in reference to operations associated with curricula, programs, interventions, methods of teaching and organizational factors.

The book *Curriculum, Teaching and Evaluation* has been designed keeping in mind the self-instruction mode (SIM) format and follows a simple pattern, wherein each unit of the book begins with *Introduction* followed by *Unit Objectives* to the topic. The content is then presented in a simple and easy-to-understand manner, and is interspersed with *Check Your Progress* questions to test the understanding of the topic by the students. A list of *Questions and Exercises* is also provided at the end of each unit, and includes short-answer as well as long-answer questions. *Key Terms* and the *Summary* section is a useful tool for students and are meant for effective recapitulation of the text.

# UNIT 1 CONCEPT OF CURRICULUM

## Structure

- 1.0 Introduction
- 1.1 Unit Objectives
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### 1.0 INTRODUCTION

If we take a look at India's history, it is clear that India has always put education on a pedestal. In fact, India, even today, is education and examination-oriented. However, the needs of a learner, the social setup, and the 21st century skills are often ignored when deciding on the learning scenario at the school level. Schools and educational institutions are very often reduced to institutes of boredom. If one were to study the policy documents, the emphasis on a curriculum that addresses equality stands out. Yet, it has never been translated into practice. Curriculum needs to be defined and it is necessary to understand the implications of the curriculum on the syllabus. This unit attempts to throw some light on the concept and determinants of curriculum.

### 1.1 UNIT OBJECTIVES

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

- Understand the concept of curriculum and core curriculum
- Discuss the principles of curriculum development
- Describe the different bases of curriculum

### 1.2 MEANING, NATURE AND SCOPE OF CURRICULUM

The term, curriculum, has been derived from a Latin word '*Currere*', which signifies a 'Race Course' or a runway on which one runs to attain a goal. Hence, from the above said meaning we can conclude that a curriculum is the instructional and the educative programme, following which the students can achieve their goals, principles, and

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aspirations of life. It is curriculum through which the general aims of school education obtain their tangible expression. Thus, all the other resources that are available in an educational institution such as the buildings, instructional materials like books, online resources, various educational equipment are all meant for effective implementation of the single outcome that is, curriculum.

Aristotle had commented on curriculum by saying, 'As things are ... mankind is by no means agreed about the things to be taught.... Again about the means, there is no agreement.'

This confusion and disagreement persists till date. We are still confused about what is to be included in the curriculum, how is it supposed to be organized, sequenced, and delivered. Apart from all the existing confusion we can, in broad terms, say that curriculum stands for the following:

- Course of study and other related material in written form for school
- The subject content that has to be taught to the students
- Course being offered in an institution
- The totality of planned learning experience that a school offers to the students

According to Oliva (1997), the following are some definitions of curriculum:

Curriculum is:

- That which is taught in schools
- A set of subjects
- Content
- A programme of studies
- A set of materials
- A sequence of courses
- A set of performance objectives
- A course of study
- Everything that goes on within the school, including extra-class activities, guidance, and interpersonal relationships
- Everything that is planned by school personnel
- A series of experiences undergone by learners in a school
- What an individual learner experiences as a result of schooling.

The curriculum could be used to refer to a list of topics included for a subject at a particular level or something that encompasses 'the total experiences provided to the children and as well as out of school' (Digantar, Activity-Based Teaching in Kerala and its Achievements: A study of pedagogical interventions in DPEP, 2002). This idea has also been supported by John Bobbitt. John Franklin Bobbitt said that curriculum, as an idea, had its roots in the Latin word for race-course. He explained the curriculum as the course of deeds and experiences through which children become adults so that they could be successful in the adult society. Furthermore, the curriculum encompasses the entire scope of formative deed, and experience, occurring in and out of school, and not only experiences occurring in school; experiences that are unplanned and undirected, or intentionally directed for the purposeful formation of adult members of society. Bobbitt spoke of the curriculum being part of social engineering.

## Social engineering in curriculum

A curriculum is prescriptive, and is based on a more general syllabus which merely specifies what topics must be understood and what level must be reached to pass a particular grade or standard.

'Unfortunately,' writes Christopher Winch, 'discussion of what ought to be taught is sometimes made opaque by an either too wide or too narrow definition of what constitutes the curriculum.' Therefore, for instance, we have heard it from a Government appointed Inspector of Education that the curriculum is 'everything that goes on in school' which would make the colour the school walls are painted a question of curriculum choice and bullying a part of curriculum content. Conversely, a definition such as a 'planned, sustained and regular learning, which is taken seriously, which has a distinct and structured content and which proceeds via some kind of stages of learning' (Wilson 1977) would eliminate some activities from children's life like woodwork. The means to interpret the question of curriculum choice is to envisage the relationship between the curriculum and the objectives of education. This is because the curriculum is the plan for the implementation of educational aims.

## Curriculum and Aims of Education

The Curriculum Committee in 1975, in India, tried to define the curriculum as 'the sum total of all the deliberately planned set of educational experiences provided to the child by the school'. As such, it is concerned with

- the general aims of education at a specific stage or class
- subject-wise instructional objects and subject matter
- courses of studies and time allotment
- teaching-learning experiences
- instructional aids and materials
- the evaluation of learning outcomes and feedback to pupils, teachers and parents

When we claim that the curriculum is the sum total of the experiences provided, it implies many significant aspects. The committee seems to identify curriculum and syllabus as one and the same. If one is to study the definition of curriculum in greater depth, it is not just a course of study; it is more of a basis for a course of study than the course itself. A true curriculum must allow choices and these choices must be alternatives in the real sense. So, a better definition of the curriculum would be the following:

As per Winch, 'Curriculum is, perhaps, best thought of as that set of planned activities which are designed to implement a particular educational aim – set of such aims – in terms of the content of what is to be taught and the knowledge, skills and attitudes, which are to be deliberately fostered.'

Broadly defined, a curriculum is a plan to facilitate learning. This plan should ideally start from where the child is, list the different dimensions of learning that are important and which educational aims it would satisfy. Stage specific objectives have to be defined, content has to be specified, and teaching and evaluation methods should be clarified.

Curriculum means two things: (i) the range of courses from which students can choose what subject matters to study, and (ii) a specific learning programme. In the

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latter case, the curriculum collectively describes the teaching, learning, and assessment materials available for a given course of study.

If we examine the definition of curriculum further, the following points emerge:

- Learning is planned and guided. This implies planning in advance what is the student going to learn and how are we going to achieve it.
- The definition refers to schooling. We are looking at what goes on inside and outside the school.

### 1.2.1 Meaning and Nature of Curriculum

Curriculum can be envisaged from different perspectives. What societies envisage as important teaching and learning subjects or topics constitute the 'intended' curriculum. Since it is usually presented in official documents, it may be also called the 'written' and/or 'official' curriculum. However, at classroom level this intended curriculum may be altered through a range of complex classroom interactions, and what is actually delivered can be considered the 'implemented' curriculum. What learners really learn (i.e., what can be assessed and can be demonstrated as learning outcomes/learner competencies) constitutes the 'achieved' or 'learned' curriculum. In addition, curriculum theory points to a 'hidden' curriculum (that is, the unintended development of personal values and beliefs of learners, teachers, and communities; unexpected impact of a curriculum; and unforeseen aspects of a learning process). Those who develop the intended curriculum should have all these different dimensions of the curriculum in view. While the written curriculum does not exhaust the meaning of curriculum, it is important because it represents the vision of the society. The written curriculum should therefore be expressed in comprehensive and user-friendly documents, such as curriculum frameworks; subject curricula/syllabi, and in relevant and helpful learning materials, such as textbooks, teacher guides, and assessment guides.

In some cases, people see curriculum entirely in terms of the subjects that are taught, as set out within the set of textbooks, and forget the wider goals of competencies and personal development. This is why a curriculum framework is important. It sets the subjects within this wider context, and shows how learning experiences within the subjects need to contribute to the attainment of the wider goals.

All these documents and the issues they refer to form a 'curriculum system'. Given their guiding function for education agents and stakeholders, clear, inspired, and motivational curriculum documents and materials play an important role in ensuring education quality. The involvement of stakeholders (including and especially, teachers) in the development of the written curriculum is of paramount importance for ensuring ownership and sustainability of curriculum processes.

The nature of curriculum includes the following:

- Curriculum is something determined by experts and authorities.
- There is no right curriculum.
- Curriculum should reflect the real world, and be practical in use.
- There are many curricula we can learn and negotiate

### 1.2.2 Scope of Curriculum

The issue of scope and sequence in a curriculum requires utmost attention. Therefore, teachers, supervisors and principals need to consider the problems pertaining to the

scope and sequence of curriculum carefully. The scope of the curriculum refers to the breadth of content that is taught in various units of study. In order to understand the requirement of breadth of content in a curriculum, we shall use the example of social studies. Social studies is a vast subject and it includes the following social sciences in its discipline:

- Geography:** This can be defined as a science which deals with the description, distribution, and interaction of the diverse physical, biological, and cultural features of the earth's surface.
- History:** This involves the study of past events with respect to human affairs.
- Political science:** The branch of knowledge that deals with state and the systems of government.
- Economics:** A social science that studies how individuals, governments, firms, and nations make choices about allocating scarce resources to satisfy their unlimited wants.
- Anthropology:** The study of humans, past and present, that draws and builds upon knowledge from the social sciences and life sciences, as well as the humanities.
- Sociology:** The study of human social relationships and institutions.

A number of study units can be prepared from these social science disciplines providing the necessary content for social studies. The scope of social studies may also be understood as consisting of the following activities related to human beings:

- Ensuring that the recreational needs of human beings are fulfilled
- Making available the required goods and services
- Meeting the religious and spiritual needs of individuals to a certain extent
- Creating laws to regulate the government at all levels, that is local, state, national, and international
- Ensuring that the educational needs of humans are met
- Transportation of people, materials, and objects
- Communication via technology as well as face-to-face
- Fulfilling health requirements of individuals
- Receiving recognition, status, and security in life
- Respecting institutions in society such as the home and family
- Determining a suitable vocation in life

Human activities or endeavours provide sufficient material for diverse units of study in the social studies. For instance, while ensuring that the recreational needs of humans are fulfilled, the teacher may suggest a unit on Hobbies and its relevance as a topic for teaching-learning situations. The teacher may also ask the students regarding their various hobbies and interest. The scope of social studies curriculum is also related to the interests and requirements of students. The interests and requirements of students may be determined in the following ways:

- Prior to teaching, taking the viewpoint of students as to how they wish to go about the lesson
- Asking the students to determine the problem areas that need to be covered within a particular unit of study
- Attentively listening to student s' interactions to gauge their interests which would help to evaluate their learning experiences

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- (iv) With the cooperation of students and teacher leadership, learning centres can be established, where it would be determined what the students will learn.

The scope of elementary school social studies may also be determined in the following ways:

- (i) Social studies authors and writers also determine the scope of social studies curriculum. The writers of social studies textbooks stress on selected facts, concepts and generalizations that the students are required to achieve. Extra learning experiences are selected by the teachers that are closely related to the topics given in the unit. This enables students to develop understanding at a higher level.
- (ii) Although not directly involved, programmers also aid in determining the scope of the social studies curriculum. The content available in the programmed learning aims at selected ideas that the students need to achieve. Programmers determine what students need to learn. The sequence of these learnings would also be decided by writers of programmed materials.

### 1.2.3 Definitions of Curriculum

Different theorists have given different definitions such as:

#### Prescriptive Definitions of Curriculum

- **John Dewey (1902):** 'Curriculum is a continuous reconstruction, moving from the child's present experience out into that represented by the organized bodies of truth that we call studies . . . the various studies . . . are themselves experience—they are that of the race'.
- **Franklin Bobbitt (1918):** 'Curriculum is the entire range of experiences, both directed and undirected, concerned in unfolding the abilities of the individual'.
- **Harold O. Rugg (1927):** '[The curriculum is] a succession of experiences and enterprises having a maximum lifelikeness for the learner . . . giving the learner that development most helpful in meeting and controlling life situations'.
- **Hollis Caswell in Caswell & Campbell (1935):** 'The curriculum is composed of all the experiences children have under the guidance of teachers. . . . Thus, curriculum considered as a field of study represents no strictly limited body of content, but rather a process or procedure'.
- **Ralph Tyler (1957):** '[The curriculum is] all the learning experiences planned and directed by the school to attain its educational goals'.
- **Robert Gagne (1967):** 'Curriculum is a sequence of content units arranged in such a way that the learning of each unit may be accomplished as a single act, provided the capabilities described by specified prior units (in the sequence) have already been mastered by the learner'.
- **James Popham and Eva Baker (1970):** '[Curriculum is] all planned learning outcomes for which the school is responsible. . . . Curriculum refers to the desired consequences of instruction'.
- **J. L. McBrien & R. Brandt (1997):** '[Curriculum] refers to a written plan outlining what students will be taught (a course of study). Curriculum may refer to all the courses offered at a given school, or all the courses offered at a school in a particular area of study'.

### Descriptive Definitions of Curriculum

- **Hollis Caswell & Doak Campbell (1935):** 'All the experiences children have under the guidance of teachers'.
- **Thomas Hopkins (1941):** 'Those learnings each child selects, accepts, and incorporates into himself to act with, on, and upon, in subsequent experiences'.
- **W. B. Ragan (1960):** 'All experiences of the child for which the school accepts responsibility'.
- **Glen Hass (1987):** 'The set of actual experiences and perceptions of the experiences that each individual learner has of his or her program of education'.
- **Daniel Tanner & Laurel Tanner (1995):** 'The reconstruction of knowledge and experience that enables the learner to grow in exercising intelligent control of subsequent knowledge and experience'.
- **D. F. Brown (2006):** 'All student school experiences relating to the improvement of skills and strategies in thinking critically and creatively, solving problems, working collaboratively with others, communicating well, writing more effectively, reading more analytically, and conducting research to solve problems'.
- **E. Silva (2009):** 'An emphasis on what students can do with knowledge, rather than what units of knowledge they have, is the essence of 21st-century skills'.

#### Oliva's Definition of Curriculum

It is a general notion that the broad field of curriculum studies has not been aptly defined. According to Barrow and Carl, further confusion arises from the fact that the term, 'curriculum', has so many interpretations. This has resulted in numerous approaches to curriculum development; Walters has described it as a field strewn with thorns. Numerous attempts to define 'curriculum' have led to this ambiguity, as the attempts have been made from the various descriptions of the concept. The description of the concept quite often mirrors the approaches of the relevant writers. Curriculum studies can be defined as a concentration within curriculum and instruction concerned with understanding curricula as an active force of human educational experience.

Curriculum studies specifically revolve around the following questions:

- What should be taught in school?
- Why should it be taught?
- To whom should it be taught?
- What does it mean to be an educated person?

Peter F. Oliva states that in order for curriculum studies to qualify as a field of study or discipline, there needs to be a clear set of theoretical constructs or principles directing it. And curriculum studies have this strong theoretical constructs and principles directing it which also serve as guidelines. The concept, 'curriculum', is, in itself, a construct. Oliva (1988) states that 'consecutive ordering of courses,' career education and behaviour goals' and 'systematic approach' are typical examples of constructs which are locked up in curriculum principles.

Another requirement put forward by Oliva for curriculum to qualify as a field of study is a vast pool of knowledge and the specific applicable skills for that discipline. Curriculum studies comply with this requirement. A major amount of subject content has been acquired from different pure and already established disciplines. Figure 1.1 is an example given by Oliva of disciplines, which may serve as sources.

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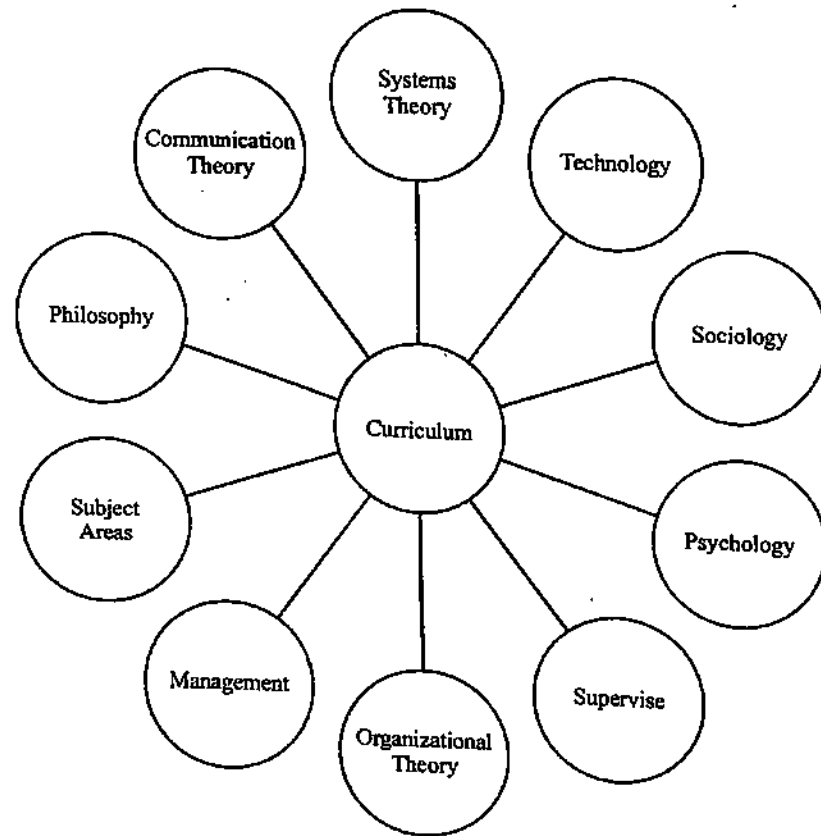


Fig. 1.1 Possible Disciplines which might act as Source (Olivia, 1988)

Curriculum studies constantly generates its own unique contents and applicable skills. Applicable skills are not necessarily unique to curriculum studies as they may also be taken from other disciplines. Though content and skills are borrowed from other disciplines, this does not detract from the uniqueness and significance of curriculum studies as a field of study. On the contrary, it highlights the dynamics and challenges of the relevant field.

Another aspect stated by Oliva is that curriculum studies has their own theoreticians and practitioners available who develop the field by their application of knowledge and skills. This process also generates new concepts and allows room for new innovations. Broadly, curriculum studies may be defined as an inter-disciplinary field of studies where different disciplines need to work in tandem to create relevant curricula. Therefore, defining curriculum studies only as a field of didacticians and subject didacticians is considered to be a one-sided narrow view. However, curriculum studies can also not be classified under one discipline as there are too many psychological, educational, administrative, and philosophical aspects.

On reviewing Oliva's description of curriculum studies, it becomes clear that curriculum studies is a comprehensive field of study in its own right. The field of curriculum studies is so vast that it includes particular contents and constructs for study purposes as well as its own role players who may be involved as theoreticians or practitioners.

According to Barrow, the field of curriculum studies originates from the field of education. Barrow suggests that 'Curriculum studies boils down to describing, explaining and justifying curriculum practice.' Brubaker states that curriculum planners develop curricula which will not only ensure control, but will also enhance understanding. However, this type of preference would influence the process of curriculum development.

Check Your Progress

1. How did the curriculum committee in India define curriculum?
2. From which word, has the term curriculum been derived?
3. How should 'written' curriculum be expressed?
4. Which questions are important with regards to curriculum studies?

### 1.3 PRINCIPLES OF CURRICULUM DEVELOPMENT

The content of curriculum is set and planned on the basis of some scholarly principles which are stated under:

- **Child-centric principle:** As current education is child-centred, thus the curriculum should also be child-centred. Curriculum should be planned keeping a child's requirements, interests, abilities, capacity, age, and circumstances in mind. In fact, curriculum is meant to bring about advancement and growth in children so that they are able to fine-tune their lives in the desired direction.
- **Principle of development of innate powers:** The innate power of the children must be drawn out and sharpened by the curriculum.
- **Principle of conservation:** Man has conserved experiences very carefully for better adaptability. Education is regarded as a means of preserving the cultural heritage of humanity. The school serves two-fold functions in this regard—preservation of the past experiences and transmission of experiences.
- **Principle of time duration:** The time for each subject allotted in the timetable reflects the appropriateness, importance, and relative significance of any school programme. Thus, the principle of the time is very important for an effective curriculum planning.
- **Principles of creativeness:** Reymont has rightly said, 'In curriculum that is suited to the needs of today and of the future, there must be definitely creative subjects.' Education not only conserves the past experiences of civilization but also helps an individual to develop his native potentialities. Thus, the culture should not be simply carried forward as it is but should also be enriched. There should be provision in the curriculum to develop the creative powers of the child.
- **Principles of civil and communal needs:** Man is a social being and lives in a well settled society. The development of the child takes place in this society. The aim of the modern education is both the development of the individuality of children as well as the development of the society in which they live.
- **Principle of elasticity and variety:** The curriculum shall create disinterest if it is rigid and narrowly conceived. Therefore, curriculum should be balanced by giving equal emphasis to all aspects like interest, abilities, variety of skills, hobbies, and habits.
- **Principle of forward-looking:** The aim of life-centred education is not limited to the present life-situations in the family and society. Hence, education must prepare a child to shoulder future responsibilities. So in framing the curriculum, we must take into consideration the future needs of the child as well as the needs of the society.
- **Principle of preparation for living:** The children should know the various activities of the environment around them and how these activities enable people to meet their basic needs of food, shelter, clothing, recreation, health, and education.
- **Principle of integration and correlation:** The subjects that are dealt with should be arranged logically and psychologically in harmony with a child's developing interests and welfare.

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- **Principle of learning ability:** Every item that is taught or discussed should be learned. An item should not only be learnable, it should also have utility in practical sense.
- **Principle of moral values:** The curriculum should develop social norms and moral values to help the students live as a successful citizen in the society.
- **Principle of individual difference:** The curriculum should be framed in such a way that every individual can have opportunity for self-expression and development. The curriculum should be based on the psychology of individual differences to meet the complexities of modern democratic society.
- **Principle of social relevancy and utility:** Subjects should not be determined on the basis of their disciplinary value but on the basis of their intrinsic value, social relevancy, and utility.
- **Principle for utilization of leisure time:** We are well aware of the famous proverb 'an idle man's brain is a devil's workshop' therefore, curriculum should consist of leisure activities as well. Variety of subjects such as sports, gardening, fine arts, photography, and subjects of aesthetic value should be introduced in the school programme to utilize leisure time of the children.
- **Principle of variety and flexibility:** The curriculum should include activities and experiences which may facilitate normal development of children. The curriculum for girls should naturally be different from that of boys as they have different needs and attitudes.

### 1.4 BASES OF CURRICULUM: PHILOSOPHICAL, PSYCHOLOGICAL, AND SOCIOLOGICAL

Curriculum is a totality of what is happening in and out of the classrooms, what are the causes, what will be the outcome, and so on. While designing or structuring the curriculum, we should keep in mind certain considerations.

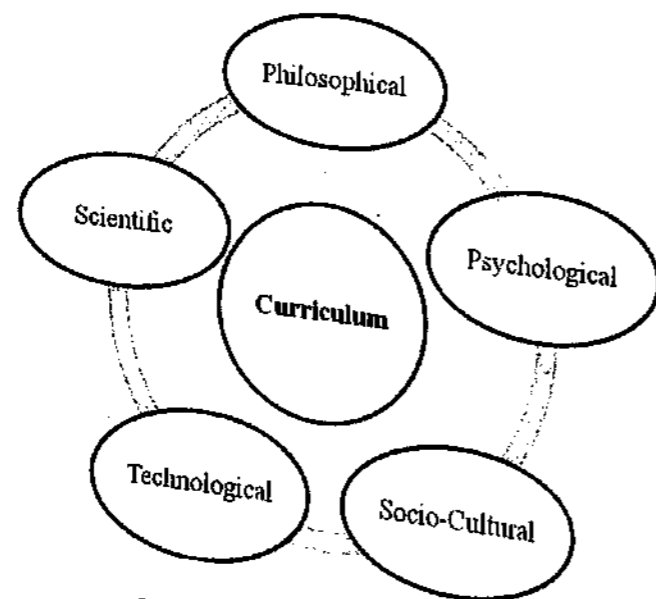


Fig. 1.2 Foundations of Curriculum

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### 1.4.1 Philosophical Foundation

Despite an increased knowledge base, growing understanding of human development, sophistication in the use of technology and an emerging focus on teaching and learning, curriculum remains primitive and traditional. The theoretical dimension of curriculum in India has progressed to a better level; National Curriculum Framework-2005 is the best example to mention here. Instead of assuming that the subjects taught are taught and incorporated in the curriculum for a reason, the premise should be included in the curriculum which can be justified in terms of future and utility. Philosophy, psychology, and sociology have a decisive role to play here in helping and supporting teachers.

The philosophy of education offers some practical purpose to the teachers. Its most significant role is to help teachers to think more clearly and accurately about different matters and aspects of education. Educational philosophy by its emphasis on accuracy and clarity is valuable in establishing what the real meaning is. Clarification of ideas about the related aspects is one of the major steps towards more effective curriculum planning. Philosophy helps to have clarity for planners of curriculum. Similarly, educational philosophers have given much thought to the aims of education; their writings in this area will give guidance to the developers of curriculum in framing the aims of education. Let us have a look into the basics of philosophy. What it is? And what does it incorporate?

Philosophy is the contemplative side of life and is the science of knowledge. It understands man in relation to the universe. According to Dr. S. Radhakrishnan, 'Philosophy is a logical enquiry into the nature of reality.'

Philosophy, thus deals with:

- the nature of reality
- the nature of man
- the goal of life, and
- the fundamental beliefs and values of life

We know that education aims to prepare a person for life and makes them fit for different life situations. Education is the strongest instrument for the achievement of the ideals of life and civilized attempt to bring about the balanced and proper development of human personality in a systematic way by considering the day-to-day experiences. Thus, it is clear that education and philosophy are closely related.

- Philosophy paves the way for education and destination. It provides guidance in deciding the goals and ideals, methods, practices, etc.
- Education is the means to achieve the goals that philosophy has made.
- As philosophy deals with the theoretical side of education, education is the practical side of philosophy.
- Philosophy establishes different aspects of education including aims of education, content, way of curriculum transaction, methods of teaching, role of the teacher, type of evaluation, form of discipline, etc.

It is philosophy which decides why a subject or a specific topic should be included in the curriculum. It also explains how the subject is to be transacted. Let us discuss different philosophies of education to have an understanding of the philosophical foundations of curriculum.

## Various philosophies and education

Now we are going to understand various philosophies with a major focus on education. As education becomes increasingly more important vis-a-vis the technological revolution and the intra generational disjuncture that we have all come to know, educational philosophy grows in importance as well. Each of the philosophy offers a different way of viewing the spectrum of philosophical positions and values about education.

Why should we have a particular activity in curriculum? How that activity is of value to the curriculum? How will it benefit the learner? What activities and experiences are required to achieve the desired goals and specific objectives determined? How do we teach? What are the strategies and methods that should be adopted for the fulfillment of the specific objectives? All these queries should be well addressed while making any suitable curriculum. The study of philosophy definitely helps in the finalization of all these aspects. Moreover, specialists in the philosophy of education have made significant contributions to clarify the relationship between the nature of knowledge and curriculum development.

Idealism, naturalism, pragmatism, and realism are considered as major philosophies. Let us have a detailed discussion about these philosophies. For clarity, we are going to discuss in a pattern namely, meaning of the philosophy, basic postulates, aims of education, curriculum methods of teaching, and the role of the teacher.

1. **Idealism:** It seeks to offer an explanation of man and the universe in terms of spirit. Therefore, idealism believes in supernatural powers. It believes in spiritual nature of man. Ideas are believed as unchanging. According to idealist philosophy, education should help in realizing the spiritual nature of the child. Idealists want curriculum to be a reflection of human culture and civilization. The main proponents of idealism are Socrates, Plato, Kant, Hegel, Froebel, Vivekananda, Gandhi, Radhakrishnan, among others. The basic tenets of idealism are:

- Priority to mind and self of the individual
- All of the universe exists in spirit
- Man is a superior creature and is distinctive in nature
- Faith in eternal and spiritual values
- It emphasizes normative and social sciences
- It believes in universal education

As per idealistic ideals the aims of education are:

- Attaining self-realization
- The making of actual or real
- Achieving the highest potentiality of the self
- Preservation and enrichment of the cultural environment
- Development of moral sense, development of inventive and creative powers

To achieve these goals, there should be an in-depth knowledge about the cultural heritage, maturity in thinking, reasoning, and higher order capacities like problem solving and reasoning. The curricular areas of idealistic philosophy consist of the following:

- **Intellectual activities:** Literature, science, mathematics, history, geography, languages, etc.

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- **Aesthetic activities:** Art and poetry to reinforce moral impulse
- **Moral activities:** Religion, ethics, and metaphysics
- **Physical activities:** Health and physical education, sports activities, handicrafts, and skills

Idealism emphasizes question answer method, lecture method, storytelling, and inductive and deductive methods of teaching. Teacher has got a high position in idealism. As per idealistic philosophy, teacher should be morally high in nature, intellectually developed, and culturally advanced.

2. **Naturalism:** Naturalism is a type of philosophy which considers nature as the whole of reality. It approaches philosophy from a pure scientific point of view. Rousseau, Locke, Pestalozzi, Tagore, Nunn, among others are the major advocates of naturalistic philosophy. It puts forward that education should focus on the nature of child. Nature of child is dynamic. The purpose, process, and means of education should be within the experiences of the child. The basic educational philosophical ideas of naturalists are given below:

- Nature is the base of all education
- Education should be child-centered
- Advocates for the maximum freedom to child
- Instincts of the child constitute the basis of all education
- Senses are the gateways of all knowledge

Naturalism assigns the following as the major aims of education:

- Self-expression or self-preservation
- Perfection of man
- Transformation and modification of instincts
- Help in struggle for survival
- To have better adjustment
- To achieve individuality and social progress

The subjects included in the curriculum, thus should be in accordance with the interests and needs, and natural environment of the children (students). Naturalistic curriculum gives importance to the sciences. Present experiences, activities, and interests of the child should be taken care of in the curriculum. They consider mathematics and languages as tools for understanding sciences. The other subjects suggested by naturalists are history, social sciences, agriculture, carpentry, drawing and arts, and physical and health education. They gave no place to religious education and traditional subjects.

Method of direct experiences and observation, play way method, and heuristic method are the suggested methods of teaching in naturalism. Teacher is an observer and stage setter in this kind of education.

3. **Pragmatism:** Pragmatism is an attitude, a method, and a philosophy that employs the practical consequences of ideas and beliefs as a standard for determining value and truth. Kilpatrick, John Dewey, William James, among others are the chief advocates of pragmatist ideology.

It does not have a belief in the existence of values like truth, beauty, and goodness. It stands for relative (based on our practice) and not for absolute (predetermined).



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The basic philosophical postulates of pragmatist philosophy are the following:

- Believes in changing nature of eternal values
- Experience is the core of reality
- Believes in testing and experimentation
- Faith in the present as well as immediate future
- It is humanistic in nature
- Believes in social values
- Believes that the development of personality is possible with continuous interaction with environment

Education should aim at training the students to develop values for themselves. Knowledge should not be imparted, but be constructed, that is, students should be enabled to create it from their own activities as well as experiences. Education, according to pragmatism, is meant for harmonious development. It supports the learner to become socially efficient and properly adjusted.

To acquire the specified aim of education, the system should be child-centered and should be in accordance with the psychological characteristics of the learner. There should be project based and activity oriented methods of teaching in the curriculum. Pragmatic curriculum is based on the principle of utility and principle of integration. The teacher is considered as a friend, philosopher, and guide. Teacher should be the embodiment of knowledge, intelligence, efficiency, and practice.

4. **Realism:** It is considered as a belief which looks upon the world as it seems to us, to be a mere phenomenon. Realism regards the physical world as real. It argues for reality and practical knowledge. Milton, Erasmus, Francis Bacon, Comenius, Russell, among others are the chief exponents of realism.

The basic tenets of realism are:

- It emphasizes on the physical aspects of universe
- Considers universe as independent of mind
- Considers only reality as real
- Considers that God and soul don't have any existence
- Emphasizes the role of senses in attaining knowledge

Realists advocates that education should aim:

- To produce a man capable of handling the world affairs, who will be in a position to adjust with the environment
- The attainment of qualities- in terms of physic, sociability, intelligence, and morality to become a complete man.

The realists oppose bookish and abstract knowledge and want to bridge the gap between the situations and life at school and the outside life. It is possible only through inculcating teaching and learning on real issues. Realists demand for vocational subjects. They emphasize science subjects and argue that the curriculum should possess utility. Mother-tongue and physical education are given important position in realism, along with the introduction of subjects like mathematics, economics, history, geography, political science, law, etc.

Realism advocates for inductive method, correlation method, sensory method, and method of observation and experimentation. Teacher is considered as a stage setter and observer.

## Other philosophies and education

Now we have learnt the basic philosophies in terms of their importance in structuring the curriculum. Similarly, there are some other philosophies, which deal with education and curriculum. It is also relevant to see these philosophies, which have been categorized as other philosophies.

1. **Existentialism:** It is a modern philosophy and is against many outlooks and methods of traditional western philosophy. Existentialism is a protest against totalitarian movements. It is an attempt to reach the innermost core of human existence in a concrete and individual fashion.

The existentialist sees the world as one personal subjectivity, where goodness, truth, and reality are individually defined. Reality is a world of existing in which truth is subjectively chosen and goodness is a matter of freedom. According to existentialism, man should be the master and machine should be the slave. The basic characteristics of existentialism are:

- Man is the centre of the universe and the basic feature of human personality represents his uncontrolled freedom
- Existentialism emphasizes a man's inner life and experiences
- Freedom is the watchword in existentialism
- It holds that action is the only thing that enables man to live
- It argues for suitable opportunities that enables self-realization
- It states that man is neither alone nor complete
- Mind is considered as the source of all knowledge
- It does not believe in values

Existentialism puts forward that the aims of education are to make a complete man, to develop a balanced personality, to enrich the mind, to enable one to lead a good life, to enable man to have better choices, and to preserve the freedom of man.

Existentialists do not argue for a rigid curriculum since they consider freedom to be the most important aspect. All the subjects in schools should enable the learner to develop properly. They give first place to humanities, especially arts and literature. They assign second place to social sciences. They consider the moral and religious education as important in curriculum. Existentialists consider teacher as a base of education who fosters the individual growth. Teacher has to engage actively and need to face all the challenges. They recommend Socratic Method, self reading, and learning by doing; and discourage mechanization and group methods.

2. **Constructivism:** Vygotsky through his constructivist philosophy to education stresses that cognitive development is a social activity. He adds that activities in the cultural development of child are needed twice: on the social level, and on the individual level. Child develops his/her own thoughts and attitudes through social interaction and communication with peers and other members of society. Child can also learn by observing the activities and interactions of others in a social setting.

Teachers should keep in mind all these and need to interact meaningfully with students. Depending on the social context of the classroom, a student may benefit from being able to interact freely and socially with other students as they learn.

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Vygotsky focuses on the importance of language and communication. To him, language and thinking are inescapably linked, and even though they first appear independently in infants, they quickly merge into a single function as humans develop into fully social beings. The teacher must carefully define and explain new scientific terms which will help the students to develop the appropriate thought processes associated with the scientific concepts and their labels. Vygotsky insists that we should consider the socio-cultural context of learning and the environment outside of school.

Learning is simply the process of adjusting our mental models to accommodate new experiences. It involves:

- Learning is a search for meaning by an individual.
- Meaning requires understanding the complete as well as parts of a concept or idea.
- In order to teach well, teachers must understand the mental models that students use to perceive the world around them.
- The purpose of learning is for an individual to construct his or her own meaning and not just memorizing.

**3. Perennialism:** The most conservative, traditional, or inflexible of the other philosophies is perennialism, a philosophy drawing heavily from classical definitions of education. Perennialists believe that education, like human nature, is a constant.

Perennialism is a reactionary educational philosophy that would return the content of education to its very earlier roots. Knowledge of truth, beauty, and goodness would be at the core of education. Similarly, the cultural heritage and social implication would not be considered as important. According to the philosophy of perennialism, knowledge is universal and eternal. Absolute reality is ideal reality. Perennialism is consistent with the religious conceptions of divine control over life and according to perennialism religious conception is not a necessary characteristic. They also believe in the form of knowledge that is external to human beings. Truth and good are self-evident. Perennialism considers knowledge as eternal and it would bring the study of the great works of the past to centre stage.

Education has the function of awakening the latent rationality residing in children. Learning is reasoning and not mere doing. The curriculum should be the reflection of the diversity of children's interests. All children should become familiar with and sensitive to the great works.

Schools for the perennialists exist primarily to reveal reason by teaching eternal truths. The teacher interprets and tells. The student is a passive recipient. Since truth is eternal, all change in the immediate school environment is largely superficial. The educational ideals of perennialism are:

- We should teach the principles that are of everlasting importance to all people everywhere.
- Education should be the same for everyone irrespective of any differences.
- Exposure to finest thinkers of history should be given as models for discovery.
- Education should address the questions that have persist over time.
- Lecture, coaching, seminar, and Socratic dialogue are the methods of teaching.
- As per this philosophy, education is teacher directed.

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- The major goal of education is independent reasoning.
- Curriculum focuses on great ideas using the Great Books

Perennialism does have a great influence today. It has a policy of inclusion, that is all children can learn the same quality of knowledge. Similarly, it is argued that individual differences must be compensated by remedial or supplementary instruction.

**4. Essentialism:** Essentialism emphasizes cultural heritage. Similarly, it advocates for the need to pass on to the younger generation the knowledge as well as the skills essential for the continued functioning of our society.

As per essentialist philosophy, mathematics, sciences, and the other stores of basic knowledge are the basis of learning. It gives importance to the time-tested content that has proven its worth to society. Essentialism would emphasize the knowledge that is well-established and functioning in the present world.

Education has the function of cultural conservation. It has the responsibility to pass along the principles and foundations of cultural conservation. Essentialism is a conservative philosophy of education that expects change to come in an orderly fashion along the pathways that have already been laid. Beliefs and institutions are intrinsically good and are the important parts of reality.

Schools are the means of maintaining the cultural structure of society. Schools have the duty to develop the certainty and trust to sustain the culture and society. Education should contribute to discover the intact laws of worldly existence. Education should help human kind to adjust to these laws and the society that has developed within the context in which they live.

**5. Progressivism:** This philosophy has its roots in the pragmatism of the late nineteenth and early twentieth century. According to Brameld, 'it is the reflection of technological, experimental, worldly habits and accomplishments that have powerfully shaped the modern culture.'

Progressivism is a philosophy that builds the seeds of revolutionary change into its very texture without suggesting what the change shall be. Progressivism is characterized by an open-minded and flexible attitude that views all knowledge about the world in a state of fluctuation. To progressivists, the universe is in a continuing state of development with new experiences integrating into the existing mass of prior experiences.

Progressivism represents the quintessential philosophy of education for a democratic society. It believes in an underlying belief in each individual's ability to deal with the greater questions of the world. Similarly, it proposes that each person has the ability to actively participate in solving the problems of society. Progressivism would pursue knowledge of the processes contributing to the effective decision-making regarding the problems of the present.

Education should meet the capacities of each individual. It should develop the abilities and capacities so as to ensure the greater involvement of everyone in decision-making as well as problem-solving process of society.

According to progressivists, knowledge is both social and individual and is the product of activity; education prepares people to engage in the decision-making process of the community in an effective and desirable way.

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Schools should start by addressing interests and problems close to students. Schools should guide the students to achieve greater control of abstract knowledge which can be achieved in a gradual manner. It advocates for inquiry-based learning and problem-solving method. Both of these ensure maximum participation and initiation of students. Education should be experience-centered, dynamic, and specific to the world around the learner. Curriculum should be more than child-centered. For realizing this curriculum, schooling should be experience-centered involving the body, mind, feelings, and emotions of the child.

It means basing instruction on the needs, interests, and developmental stage of a child; teaching students the skills they need in order to learn any subject instead of focusing on transmitting a particular subject; promoting discovery and self-directed learning by the student through active engagement; having students work on projects that express students purposes and integrate the disciplines around socially relevant themes; and promoting values of community, cooperation, tolerance, justice, and democratic equality.

Pedagogical progressivism proposed to do a lot more than just making schools efficient. It called for turning education upside down by having the purposes and interests of the students drive curriculum rather than forcing the curriculum onto the student. It offered a way to free schools from artificial constraints and rigid disciplines and unleash the student's natural impulse to learn. It proposed to recreate the classroom as a model democratic community of learners, which could become a way to reduce injustice and enhance democratic equality in the larger society.

Early progressive educators wanted to work on all aspects, namely, the intellectual, physical, and emotional aspects of a man. John Dewey took the original definition of progressive education and broadened it to include the student as an active participant in his/her education, prepared to contribute to a democracy. One of the primary functions of schools, according to progressivists is to prepare citizens for full participation in democracy.

According to progressivist thought, the skills and tools of learning include problem-solving methods and scientific inquiry; in addition, learning experiences should include cooperative behaviours and self-discipline, both of which are important for a democratic society.

**6. Reconstructionism:** It is a further elaboration of progressivism. According to reconstructionism, the established institutions of society are no longer sufficient to deal with the problems.

Reconstructionists have a utopian view of a just society in which all the members contribute to the benefit of the group and thus to each other. Reconstructionism is a human-centered as well as futuristic philosophy which would conceive of a grand social design that would guide the activities of society towards better life. Reconstructionism would develop knowledge of what the future should be and the means for reconstructing society in order to achieve the suitable development for desirable future.

Schools are instrumental in fulfilling the utopian vision of a new and better social order. Similarly, they will help to achieve a planned set of outcomes for a better life. Schools are the media for enriching and enhancing the cooperative mentality. Educators, who promote the social reconstruction ideology, view curriculum from a social perspective. They have faith in the ability of education to educate 'the

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masses of humanity' in how to critically analyse themselves in relation to their society, understand the ills of their society, develop a vision of a better world based on the concept of social justice, and actualize that vision through the medium of curriculum.

Social Reconstructionists assume that education has the power to educate people to analyse and understand social problems, envision a world in which those problems do not exist, and act so as to bring that vision into existence. Thus, education of individuals is appropriately revitalized so that schools can lead to social transformation.

Social Reconstructionists want to reconstruct society through social processes. Their first concern is the education of the group and then the education of the individual. From this perspective, learning experiences are construed to be group experiences that take place through human interaction, and the focus is on the 'group mind' rather than the 'individual mind.'

Schools should not only teach the child to develop socially, but also to participate in the social planning as well. Learners must see how society plays a critical role in evolving people. Learners must also be convinced of the validity and urgency of change.

The primary purpose of the social reconstructionist curriculum is to confront a learner with several problems that humankind faces. The curriculum does not have universal objectives and content. Teacher must relate national, world, and local purposes to the students' goals. Cooperation with the community should be ensured by the teacher.

**7. Secularism:** It is a belief that state, morals, and education should be independent of religion. In other words, it is a belief that religion should not interfere with the functions of the state. Secular education is advocated for the development of moral outlook, wider attitude, pluralistic outlook, democratic qualities like liberty, equality, fraternity, and cooperation, the promotion of cultural development, and the development of scientific spirit.

Lessons should be free from religious bigotry and biases. Good ideas and values of different religions can be presented appropriately. Activities should be organized for developing religious harmony and mutual cooperation. Scientific spirit is more emphasized in secular curriculum. Teachers should be democratic in nature and broad-minded.

**8. Scientific Humanism:** It considers both scientific and humanistic aspects of life in explaining education. Science helps to improve life by resolving problems and plays a vital role in the progress and improvement of human life. Similarly, life is considered spiritual as well. It is argued that science alone cannot bring forth progressive change in human life. Along with science, there should be teaching of humanities, social sciences, aesthetics, and religion.

Considering the postulates of different philosophies on education and curriculum, it can be concluded that a curriculum should be a reasonable one in terms of its subject matter and method of teaching. While developing a curriculum if the planners keep in mind the different viewpoints of various schools of philosophy they can structure it in a comprehensive and balanced manner.

### Suggestions to Curriculum Framers and Teachers

The following are the suggestions for improving the primary-stage school curriculum:

- The gap between curriculum planning, formulation and its implementation should be minimized. Curriculum should be revised and reviewed after every five years.
- The social, cultural, demographic, environmental, and economic conditions of the country should be kept in mind while developing school curriculum.
- The activity based approach, learning by doing, learning without burden, and joyful learning should be followed in preparing curriculum.
- Both physical sciences and social sciences should be integrated into environmental studies.
- The integrated approach should be followed in preparing the textbooks. It will lessen the burden on children. The essential/core components of curriculum should be followed for maintaining equal standards.
- All sections of the society should be involved while preparing curriculum.
- Rigorous intensive in-service training for primary school teachers should be organized for their capacity development in different subjects on a regular basis. Monitoring and supervision of in-service training should be conducted regularly.
- Continuous and comprehensive evaluation should be made more effective and should be included in the curriculum.

The following suggestions would be helpful in the improvement at the upper primary stage in school curriculum:

- The syllabus of social studies should be reduced (West Bengal, Arunachal Pradesh, and Maharashtra). Outdated information should be deleted for reducing the curriculum load.
- Stress should be minimized by organizing activities related to arts, work education, health, and physical education. (Gujarat, Delhi, Uttarakhand, Madhya Pradesh, and Kerala)
- The needs of coastal, hilly, tribal and regional areas should be considered in school curriculum.
- Local specific examples should be included in history, geography, science, and mathematics subjects. The examples on morals and values set by educationists, thinkers, and philosophers should also be incorporated in curriculum.
- Feedback and remedial work should be strengthened. Weightage should equally be given to out of classroom activities.
- Emerging issues and concerns like globalization, privatization, and liberalization should be included.
- The competency and content enrichment should be provided to teachers through in-service education programmes.
- Curriculum should be framed in such a way that CCE (Continuous Comprehensive Evaluation) and grading system can be introduced
- Play way/Games/Role play/Puppetry/Performing Art should be introduced. If possible figures/diagrams must be localized state wise.

- Illustrations and examples should be included in the curriculum and capacity building programme for school teachers should be organized on regular basis.
- Regular and intensive training programme for elementary school teachers should be organized in the area of teaching methodology, evaluation techniques, and classroom teaching.
- Modules for in-service training programmes should be developed according to the needs of the teachers.

The following are the suggestions for improving the secondary-stage school curriculum:

- Value education, art education, physical and health education and work education should become integral part of 10-year school curriculum and more weightage should be given to these areas in school curriculum.
- Higher level of knowledge should be included in science and mathematics.
- The syllabus of social sciences should be reduced and integrated approach should be followed for teaching social sciences.
- The curriculum should have clear-cut future directions for career-making so that the students can choose science, commerce, or arts.
- Outdated information and difficult concepts should be deleted for reducing curriculum load.
- Linkages should be established between secondary and senior secondary curriculum.
- The curriculum should include Information and Communication Technology (ICT).
- Local examples, specifically to be included in the social sciences, science and mathematics.
- All sections of society including workers, experts, teachers, educationists, elected representatives to be involved in framing curriculum. Their opinions and suggestions to be considered.
- Grading and Continuous and Comprehensive Evaluation should be introduced in the evaluation system.
- The school curriculum up to secondary stage should be visualized as a unit. The totality should reflect the continuity of curricular activities.
- Capacity building programme for secondary school teachers about new techniques and methods of teaching, use of audio, video aids in classroom teaching to be organized on regular basis.
- School Curriculum should be revised on the basis of NCF-2005. Science Subjects should be clearly indicated as physics and chemistry and not as physical science. Stress must be laid on mathematics and vernacular classes.
- Practical work should be encouraged in all subjects i.e. science, mathematics social studies and languages.

### 1.4.2 Psychological Foundation

Psychology is the systematic scientific study of behaviour and the knowledge that results from that study. It studies the overt as well as covert behaviour. Psychology considers that all human functions are determined and carried out by mental processes. There are many branches of psychology dealing with specific topics. Educational psychology, one



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of the applied forms of psychology, deals with how people learn. With the knowledge of educational psychology, teachers can stimulate, motivate, guide, direct, test, and evaluate the learning of children. The psychology of child development indicates that each individual has certain capabilities, abilities, interests, attitudes, intelligence, and many other potentialities. Similarly, everyone has certain needs—physical, mental, and emotional and further all have some kind of psychological problems. The psychology of individual differences indicates that no two people are alike.

Pedagogy and psychology run side by side, and the two should be considered congruent features of good education.

### Important assumptions about curriculum

It is clear that curriculum should be flexible enough to allow its adaptation for the special needs of children. Teachers must view curriculum as a process of planning the best possible programme for children, parents and teachers. The following assumptions about curriculum are very important as it reveals the psychological foundations behind curriculum:

- Curriculum is related to the overall quality of the programme.
- Curriculum must focus on the 'whole child' and programmatically integrate areas of development.
- Recreation and leisure serve many functions, and thus should be taken into account in curriculum.
- Teachers must agree with the philosophy and practices of the curriculum and understand its content so as to ensure effective teaching, considering the individual differences.
- Teachers must understand the development and theories of learning.
- It should be considered that children are active learners.
- Curriculum should be developmentally appropriate.
- Curriculum should reflect the role of social and cultural contexts in children's development and learning.

What are the ingredients of meaningful curriculum? A meaningful curriculum should be in accordance with the mental abilities, personality characteristics, capabilities, and behavioural qualities of children. Moreover, it should cater to the intellectual, emotional, social, and aesthetic needs of the learners. To meet the individual differences, it is appropriate to incorporate as many activities and multiplicity of programmes as possible. Thus, the content of curriculum should make a liberal provision for a variety of subjects, courses that are theory-based, practice-oriented, and vocationally-designed. Moreover, there should be core, elective, optional, advanced, add-on, and remedial courses in the curriculum.

The curriculum should include:

- Certain subject areas, which can be learnt by students of average physical and mental abilities
- Subject areas of special interest to a few learners to meet their special needs
- Subjects and activities, which will be competent enough to cater to the needs of gifted and talented ones

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- Subjects and programmes of remediation for the backward students or slow learners
- Provisions for creative and multitalented learners and special measures for socially and culturally deprived children.

Recently new materials have been devised, tried out in the classrooms, and then revised in terms of findings gleaned from an analysis of teaching and learning problems. Knowledge of child development has been put to use in actual classroom learning.

### Experimented approaches of psycho-friendly curriculum

As per the considerations of psychology of education the following considerations were employed and experimented in different countries over the globe in curriculum:

- The principle that students can be introduced to a subject as early as desired, provided it is presented properly and the students have the prerequisite background of experience.
- Transfer of learning is enhanced when basic concepts, generalizations, and processes of inquiry are emphasized.
- Guided discovery of relationships is proven effective for more efficient and permanent learning.
- Interest and motivation can be generated through the inquisitiveness about the subject. The same students can be guided and taught about how to raise questions, how to relate and find out the relationships, how to interpret the findings derived, how to formulate principles, and how to engage in different forms of inquiry.
- Meaningful verbal learning, that is, the organizing of facts into conceptual schemes that can be used to generate ideas, ask questions, among others.
- Inductive approach is suggested because of its value in promoting curiosity about the subject. They help in making generalizations as well.
- Deductive approach is good for developing skill in explaining new facts, formulating hypotheses, and interpreting information.
- The study of selected topics in depth is required than the study of many in superficial.
- Depth and breadth of learning are attained through recurring encounters with concepts, processes, theories and generalizations of higher cognitive levels.
- Learning is enhanced if it is continuous and linked. When there is a conceptual and process continuity, it is very effective.

### Curriculum and learning hierarchy

What learning is, how learning takes place, and the characteristics of learners should be the considerations in the design and development of curriculum. While talking about learning, important thing is the ordering of material and subjects as per the relevance. To plan sequences of instructions directly related to the teaching and learning process, the theory of hierarchy of learning by Gagne is very helpful to the curriculum planners. Sequences of instructions should be planned in hierarchies to provide for the attainment of specific terminal behaviour. Let us discuss in brief the hierarchy of learning.



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Gagne identified eight forms of learning and arranged it in a hierarchy. They are:

1. **Signal learning:** It is the development of a reflexive response to a signal by repeating the signal in proximity to an unconditioned stimulus. It is the first form of learning.
2. **Stimulus-response learning:** It is referred to as trial and error, operant, or instrumental learning. It is the initial stage of learning words.
3. **Motor chaining:** It is the connection of a set of stimulus response learning. It consists of operating a model and use of science equipment.
4. **Verbal association:** It consists of learning sequences of sentence patterns and memorizing verbal expressions.
5. **Multiple discrimination:** It is to learn to make different responses to objects and events and to distinguish them from each other.
6. **Concept learning:** It is learning to put objects or events into a class and responding to them as a group.
7. **Principle learning:** It is the learning to link concepts to each other to show relationships as in generalizations.
8. **Problem-solving learning:** It is the use of principles to attain a goal and thereby, learning a higher order principle that change the learners capability.

Theories of development and learning

The developmental theory from which a curriculum originates may be explicit or implicit. Different theories are discussed below:

1. **Socio-cultural theory:** Lev Vygotsky in his theory emphasized the following:
  - Influence of society and culture on children's development
  - Role of languages in developing higher order thinking skills
  - Importance of play in enhancing social and cooperative behaviour
  - Zone of proximal development in helping children to learn; it is the remoteness between the actual developmental level as determined by learner through independent problem-solving and the level of potential development as determined through problem-solving in association with others.
  - Children must share their knowledge with others, who may be thinking in a different way to derive at a conclusion on shared understanding.
  - Emphasizes the role of imaginative play that may enhance cognitive development of strengthening memory and reasoning power; moreover, it causes for enriched language development and increased social competences.
2. **Multiple intelligence theory:** Gardner proposed seven kinds of intelligences, namely, linguistic, logical-mathematical, musical, bodily-kinaesthetic, spatial, interpersonal, and intrapersonal intelligences. The basic ideas are:
  - Children differ in the strength of all intelligences.
  - Family, culture, and community influence the development of intelligences and the way the intelligences are expressed.
  - Curriculum must offer children a diverse array of opportunities to foster development in all the areas of intelligences.

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- Assessment must go beyond the areas, typically associated with academic achievement.
3. **Cognitive development theory:** Jean Piaget put forward a theory of human development which is relevant to education. He proposed four stages of cognitive development. It is shown in Figure 1.3.

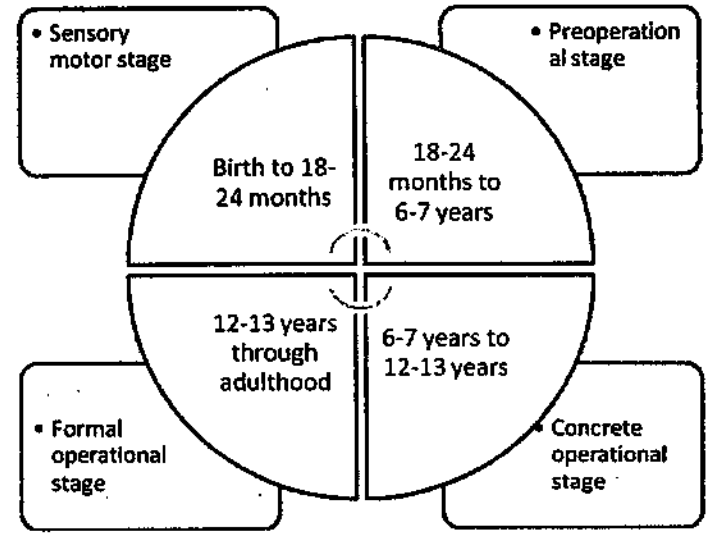


Fig. 1.3 Cognitive Development: Stages

The postulates of the theory are:

- There are several processes that describe development and learning.
- Learning occurs as children construct knowledge through active exploration and discovery in their physical and social environments.
- Children assimilate when they match concepts, skills, and information gained from their experiences with the environment according to their previous understanding pattern.
- Accommodation occurs when the mental scheme must be changed to fit the new and to incorporate it in the cognitive structure.

Cognitive theory considers learning as a cognitive activity. Cognitive development, according to them, is a product of interaction of the environment with the intellectual potential and activities of an individual. Cognitive approach leads to logical methods for organizing and interpreting learning. The hierarchical system of cognitive stages has often been taken as the foundational basis for structuring the curriculum. They are (a) the content of the curriculum should reflect the stages of development (b) children should not be requested to perform at a cognitive level prematurely, and (b) once a child has entered a cognitive stage, experimental enrichment contributes to increased abilities associated with the stage.

4. **Behavioural theory:** Watson, Skinner, Pavlov, and Bandura are the main proponents of this theory. This theory focuses on objective and observable principles that influence human behaviour. The basic ideas can be summarized as:
  - Pavlov in his stimulus-response theory states that an unconditional stimulus and unconditioned response are used to elicit a conditioned response to a conditioned stimulus.

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- Skinner's theory of operant conditioning is an explanation of behaviour that allows for many actions and behaviours being performed spontaneously, not always in response to something else.
- Learning is viewed as a process, whereby a child is conditioned to display expected behaviour and knowledge through the use of reinforcement and punishment.
- Both human and physical factors in the environment should be tailored to produce predictable results in learning.
- Bandura in his social learning theory attempted to describe the cognition of individual.
- Social learning theory recognizes that observation, modeling, and incidental learning have a key role in children's learning and behaviour.

Curriculum according to the behavioural school of thought is based on:

- Specific objectives which are well defined
- Suitable instructional materials and media as per the capacities of the learner
- Skill acquisition
- Diagnostics and remedial measures
- Positive reinforcement
- Modification of behaviour through specific tasks and step by step activities.

**5. Psychodynamic theory:** Sigmund Freud and Erik Erikson explained learning in a different way. Freud emphasized emotional and psychological aspects of children. As children move through different stages of development (Oral, anal, phallic, latency, and genital), the three subconscious forces—id, ego, and superego come into play in their development and behaviour.

- Id is the inborn desire, which drives the present from birth and is based on pleasure principles.
- Ego develops during the anal (1-3 years) stage and is based on reality principles.
- Ego controls emotions, thoughts, and behaviour.
- Superego develops during phallic stage (3-5 years). It is based on the principle of morality and it represents ethical values.

Erikson puts forward eight stages of development called stages of psychosocial development. These stages specify identity crisis or task that each person must resolve at each stage. The successful resolution of each task during each stage, results in the ability to perceive the world and self correctly. It ensures the development of a healthy personality and mastery of the environment. Curriculum planners have a lot to adapt from these theories.

**6. Maturation theory:** Hall, Havighurst, and Gesell are the chief exponents of this theory. Havighurst believed that developmental tasks are those things a person must learn if he or she is to be evaluated. Moreover, this will also help him to evaluate whether he is a happy person or not. Similarly, Gesell developed an array of tests to assess and describe children in ten areas of development. Each

category includes numerous areas on which assessment is required. He assessed the following categories of development.

- Motor
- Personal hygiene
- Emotional expression
- Fears and dreams
- Self and sex
- Interpersonal relations
- Play and leisure time
- School life
- Ethical sense
- Philosophical outlook

The tested data on different ten areas were used to develop gradients of development that described norms at various stages. Gesell believed that child's genetic endowment determined development and behaviour and that internal maturational factors guided growth and development.

**7. Field and Gestalt theories:** It considers that human beings are innately interactive. Observing physical interaction between the individual and the environment is relatively insignificant. Therefore, the psychological change in the individual is important. Here, learner variables occupy an important position.

Early Field theorists were known as Gestalt theorists. They viewed perception and learning as holistic experiences based on the grasping of patterns and configurations. They viewed that whole is greater than the sum of its parts. Kohler and Wertheimer are the major Gestalt theorists. The Gestalt laws of learning are:

- **Law of similarity:** The pattern or relationship among the components is created by their similarity.
- **Law of proximity:** Items that are closer to each other in space and time, are grouped together.
- **Law of closure:** It refers perceptually to enclosed areas that form holistic units more readily than the areas which delineate in open fashion.
- **Law of good continuation:** It refers to the perceptual and logical completion of incomplete pattern.

**8. Humanistic theory:** This theory considers human beings as unique and distinct from all other species. They considered complex traits such as feelings, attitudes, and hopes as essential to the understanding of humanness. Moreover, it is not enough to study humans in terms of perception and cognition, but they need to be studied outside the laboratory.

Abraham Maslow is the main exponent of humanistic learning. He has developed a theory of human needs and motivation. Maslow identified basic human needs and arranged these into a hierarchy of prepotency. This became a backbone of many curricula. The hierarchy based on human needs of Abraham Maslow is shown in Figure 1.4.

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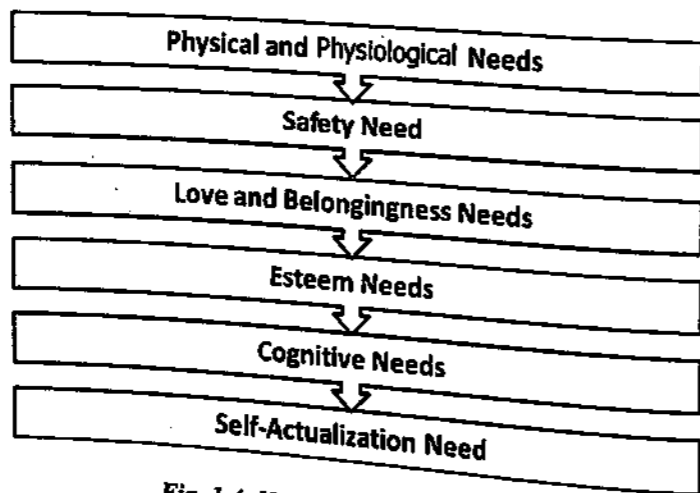


Fig. 1.4 Hierarchy of Human Needs

We have seen different theories of learning and human development. It is of importance that for every curriculum, the different aspects of psychology should be considered. Basic needs, individual differences, maturation, developmental stages, etc. are to be taken into account while structuring a curriculum.

**1.4.3 Sociological Foundation**

Society and education are related to each other. The purpose of schooling is to serve the needs of the society. Similarly, society and its perceived demands form the basis for content selection for schools. Therefore, the curriculum should be in accordance with the demands of society—existing as well as emerging. The Secondary Education Commission states that 'curriculum must be vitally and organically related to community life.'

Another way in which the social setting is utilized as a source of content may be found in the illustrations of contemporary situations that are selected to highlight concepts and main ideas of the disciplines.

**Social and cultural considerations in curriculum**

How are society, culture, and curriculum related to one another? Teachers and other professional educators have realized that society and culture have a major influence on education.

The features of society that influence the education as well as teaching and learning endeavour are:

- The diversity prevailing in society in terms of religion, language, region, caste, community, etc.
- The standards and mores prevailing in different societies.
- Facilities of transportation, communication, among others.
- Impact of westernization and modernization, and their variation.
- Pattern of discipline prevailing in different communities.
- Child rearing practices of the society and the prevalent parenting styles.

These factors would influence the making of curriculum either directly or indirectly. Other social forces, which have a major influence on education comprise separation leading to student attrition, misuse of resources, reduce in contact of parents with children,

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organization of class structure as per the different patterns of values, and teacher empowerment by school-based decision-making.

The needs stimulated by social and cultural conditions are met through educational policies and plans. It is necessary that potential teachers and experienced educators should be aware and skillful in following the course of policy development and examination, considering the different dimensions of social life. The following considerations have to be taken into account.

- Teachers and professional educators need to understand the major sociological and social psychological theories, with the aim of analysing objectives, social processes, organization, and improvement of formal and non-formal education.
- Preparation of teachers and professionals of education should involve knowledge of human social development.
- Specific contextual theories like functionalism, symbolic interactionism, psychoanalysis, behaviourism, cognitivism, constructive ideology, modern vs. postmodern approaches, emotional intelligence, cross-cultural methodology, cultural learning, etc. should be taken into account because these theories have high social impact.

There are many social forces which influence educational process and purposes such as:

- Family and its value system and structure.
- Culture-including cultural identity, diversity, patterns of socialization, among others.
- Race, ethnicity, citizenship, and educational issues of multiculturalism, group and individual identity, desegregation, change of attitude, and effects of incorporation.
- Social class-class differentiation and education, consequences of class, social mobility, socio-economic status, social reproduction, stigma of poverty, and meritocracy.
- Gender issues-socialization processes, motivational comparisons, and role definitions.
- Alienation-including student attrition, substance abuse, and gangs.

Schools are an integral part of society and are established for the development of society. School influences society through its curriculum—the way and plan of teaching and learning and other activities. Through teaching of curriculum, schools can influence the way society functions. Similarly, society also influences curriculum in several different ways. No curriculum will be a success without reflecting the society in which it is being enacted. It is essential to examine the social forces that create the curriculum. The following issues need to be addressed while creating or designing a curriculum:

- The extent of influences that are experienced outside school on a good curriculum
- Changes occurring in society and their effects on curriculum

Society-related curriculum should be connected to the level of knowledge that is required by an average person in daily life. It should be futuristic and sufficient enough to make a career. It should fulfill basic and unavoidable needs thrust by society as a

mandatory qualification on various degrees and professional courses. The basic minimum should be ensured by imparting the curriculum.

### Cultural diversity and curriculum

Diversity is becoming a very common feature of society. This can especially be observed in urban areas. In the present day, society is now characterized as being extremely multicultural, multi-ethnic, and multi-religious. It has been mentioned earlier in the text that curriculum influences society and in a similar manner society influences curriculum. Therefore, it is of utmost significance that curriculum designers comprehend the diverse changes taking place in society and integrate them in the curriculum so to reflect these changes are reflected in the curriculum. Globalization has become the culture of this rapidly-changing world. This will result in society becoming more diverse, as human migration will bring new values and new teachings, which will develop a new way of life. Therefore, curriculum should address these requirements of society.

Educators and policy planners should incorporate the learning experiences and content desirable enough to ensure the assimilation or integration of the diverse groups. This will involve an understanding of different cultures, religions, and ethnicity. Cultural diversity of pluralism recognizes that society is composed of numerous voices and ethnic groups. Curriculum should be flexible enough to consider all the peculiarities of these diverse groups of society to meet its real goals. It is essential to establish different programmes, pedagogical approaches and strategies, flexible nature of curriculum, and different educational environments to meet the demands of all types of students.

### Use of technology in curriculum development

The judicious use of technology can increase the reach of educational programmes, facilitate management of the system, as well as help address specific learning needs and requirements. For instance, mass media can be used to support teacher training, facilitate classroom learning, and be used for advocacy. Possibilities of teaching and learning at varied paces, self-learning, dual modes of study, etc. could all benefit from the use of technology, particularly ICT. The increasing use of the Internet has enabled the sharing of information and provided space for debate and dialogue on diverse issues hitherto unavailable on such a scale. Technological innovations are also necessary for appropriate equipment and aids for meeting the learning requirements of children with special needs. What needs to be underscored is that technology could be integrated with the larger goals and processes of educational programmes rather than viewed in isolation or as an add-on. In this context, technological use that turns teachers and children into mere consumers and operators needs to be reviewed and discouraged. Interaction and intimacy are the keys to quality education, and this cannot be compromised as a principle in any curricular intervention.

### Modernization and innovation of curriculum development

Individual teachers often explore new ways of addressing the needs of students within their specific classroom or context (including constraints of space, large numbers, absence of teaching aids, diversity in the student body, the compulsions of examinations, and so on). These efforts, often pragmatic and creative and ingenious, by and large remain invisible to the school and the larger teaching community, and are usually not valued by teachers themselves.

The sharing of teaching experiences and diverse classroom practices can provide opportunities for an academic discourse to develop within schools as teachers interact with and learn from each other. This will also encourage new ideas and facilitate innovation and experimentation. How can innovative and creative ways of teaching and learning be encouraged and supported by the system, so that they can become a body of practice that can be brought to a stage where they can be built back into the system?

For a start, there is a need to create structured spaces within schools, and at the level of the cluster and block, where teachers are encouraged to share and discuss classroom practices and experiences. If seen as worthwhile, some of these ideas and practices can be systematically followed. It is also important to bring together groups of teachers within and across schools and provide support to them in terms of resources as well as time to work together. There is also, a need for documentation and research on identified 'good practices'. At present, there are funds for this purpose both with DIETs (part of whose mandate is identification and documentation of innovative practices), and SSA for school-based research. Some of this could be used to document the diverse practices that teachers use in different classroom contexts. In addition to providing the necessary funding, the creation of an enabling environment that nurtures and provides support to such initiatives is also important.

As mentioned earlier, efforts to mainstream innovative processes and practices will be necessary. One of the main objectives of creating resource centres at the cluster level was to break the isolation of individual schools and bring teachers together on a regular basis for sharing their experiences and ideas with their peers. This is important if teachers are to develop their own professional identities and sense of belonging to a larger teaching community. It could also be one way of creating among them a sense of their own agency and fostering a sense of greater involvement and commitment to their work.

## 1.5 CORE CURRICULUM

In education, a core curriculum is a curriculum, or course of study that is deemed central and usually made mandatory for all students of a school or school system. But, this is not always the case. Like a school might mandate a music appreciation class, but students may opt out if they take a performing musical class, such as orchestra, band, chorus, etc. Core curricula are often instituted, at the primary and secondary levels, by school boards, Departments of Education, or other administrative agencies charged with overseeing education.

### Advantages

The advantages of core curriculum are as follows:

- Those students who take the ACT-recommended core curriculum in high school get better ACT scores than those who do not, irrespective of gender, family income and racial/ethnic background.
- Usually in all racial/ethnic groups, those students who take the core curriculum score between 1.6 and 2.8 points higher on the ACT composite than those who do not take the core.
- Taking upper-level courses beyond core improves the achievement of all students, irrespective of gender, family income, and racial/ethnic background.

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### Check Your Progress

5. Define philosophy according to Dr. S. Radhakrishnan.
6. What is the major step towards more effective curriculum planning?
7. What can Education help to achieve?
8. State any three ways of improving the primary-stage school curriculum.
9. Define signal learning.
10. Name the various kinds of intelligence as stated by Gardner.

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**Disadvantages**

The disadvantage of core curriculum, which consist of Math, Science, Social Science, and English is that colleges study these subjects at depth, whereas high school only gives a gist. Let us imagine that you go to a University/four year college and are undecided on the subjects to choose. You have a lot of time to choose a major as the first two years of college are mostly about completing core classes, but the last two years would be difficult as each major has its own prerequisites (core curriculum), which relates to it solely. The reason for this is to make a better-rounded student, knowledgeable in different areas and to refresh and reinforce the information learned in high school.

Curriculum development in India falls between the two extremes of centralization and decentralization. At regular intervals, the national government creates the national policy on education. This policy is inclusive of the various guidelines pertaining to content and process of education at different stages. The guidelines mentioned in the national policy of education are also elaborated by NCERT.

NCERT has launched two curriculum initiatives by using NPEs of 1968 and 1986 as its base:

- (a) The Curriculum for the Ten-Year School-a framework (1975)
- (b) The National Curriculum for Elementary and Secondary Education-a framework (1988).

At the central level, the curriculum framework that is prepared, provides a broad outlook of the school curriculum that includes the following:

- General objectives
- Subject-wise objectives
- Suggested scheme of studies
- Guidelines for the transaction of the curriculum
- Evaluation of pupil outcome

At the national level, a detailed curricula, syllabi, and instructional material is developed. The NCERT also develops syllabi and instructional materials for schools run by central organizations.

However, it is the state's decision to decide whether they want to adopt or adapt NCERT syllabi and instructional materials. Therefore, curriculum framework put forward by NCERT is always considered to be a suggestion and is not enforceable by law in the states. It is usually readily accepted by the states due to NCERT's credibility and the participatory development approach it follows. (The NCERT curriculum framework is developed on a consensus basis; all the states and union territories are involved in the curriculum elaboration).

**1.6 SUMMARY**

- The term, curriculum, has been derived from a Latin word 'Currere', which signifies a 'Race Course' or a runway on which one runs to attain a goal. Hence, a curriculum is the instructional and the educative programme, following which the students can achieve their goals, principles, and aspirations of life.

**Check Your Progress**

11. What is core curriculum?
12. Mention any one advantage of core curriculum.
13. What is the participatory development approach adopted by NCERT?

**NOTES**

- The issue of scope and sequence in a curriculum requires utmost attention. The scope of the curriculum refers to the breadth of content that is taught in various units of study.
- It is a general notion that the broad field of curriculum studies has not been aptly defined. According to Barrow and Carl, further confusion arises from the fact that the term, 'curriculum', has so many interpretations, resulting in numerous approaches to curriculum development.
- Curriculum is a totality of what is happening in and out of the classrooms, what are the causes, what will be the outcome and so on.
- The philosophy of education offers some practical purpose to the teachers. Its most significant role is to help teachers to think more clearly and accurately about different matters and aspects of education. Each of the philosophy offers a different way of viewing the spectrum of philosophical positions and values about education.
- Psychology is the systematic scientific study of behaviour and the knowledge that results from that study. Educational psychology deals with how people learn. With the knowledge of educational psychology, teachers can stimulate, motivate, guide, direct, test, and evaluate the learning of children.
- The psychology of child development indicates that each individual has certain capabilities, abilities, interests, attitudes, intelligence, and many other potentialities.
- Society and education are related to each other. The purpose of schooling is to serve the needs of the society. Similarly, society and its perceived demands form the basis for content selection for schools. Therefore, the curriculum should be in accordance with the demands of society-existing as well as emerging.
- In education, a core curriculum is a curriculum, or course of study that is deemed central and usually made mandatory for all students of a school or school system.
- Curriculum development in India falls between the two extremes of centralization and decentralization. At regular intervals, the national government creates the national policy on education. This policy is inclusive of the various guidelines pertaining to content and process of education at different stages.

**1.7 KEY TERMS**

- **Curriculum:** It is a planned, sustained and regular learning, which is taken seriously, which has a distinct and structured content and which proceeds via some kind of stages of learning.
- **Syllabus:** It is the actual content and education, included in the curriculum.
- **Hidden curriculum:** It is those things which students learn, 'because of the way in which the work of the school is planned and organized but which are not in themselves overtly included in the planning or even in the consciousness of those responsible for the school arrangements.'

**1.8 ANSWERS TO 'CHECK YOUR PROGRESS'**

1. The Curriculum Committee in 1975 in India tried to define the curriculum as 'the sum total of all the deliberately planned set of educational experiences provided to the child by the school.'



NOTES

2. The term curriculum has been derived from a Latin word 'Currere' which signifies a 'Race Course' or a runway on which one runs to attain a goal.
3. The 'written' curriculum should be expressed in comprehensive and user-friendly documents such as curriculum frameworks, subject curricula/syllabi, and in relevant and helpful learning materials such as textbooks; teacher guides; and assessment guides.
4. Curriculum studies specifically revolve around the following questions:
  - a) What should be taught in school?
  - b) Why should it be taught?
  - c) To whom should it be taught?
  - d) What does it mean to be an education person?
5. According to Dr S. Radhakrishnan, 'Philosophy is a logical enquiry into the nature of reality.'
6. Clarification of ideas about the related aspects is one of the major steps towards more effective curriculum planning.
7. Education is the strongest instrument for the achievement of the ideals of life and civilized attempt to bring about the balanced and proper development of human personality in a systematic way considering the day-to-day experiences.
8. The ways of improving the primary-stage school curriculum are:
  - a) The social, cultural, demographic, environmental and economic conditions of the country should be kept in mind while developing school curriculum.
  - b) The activity based approach, learning by doing, learning without burden and joyful learning should be followed in preparing curriculum.
  - c) Both Physical Sciences and Social Sciences should be integrated into Environmental Studies.
9. Signal learning is the development of a reflexive response to a signal by repeating the signal in proximity to an unconditioned stimulus. It is the first form of learning.
10. Gardner proposed seven kinds of intelligences namely, linguistic, logical-mathematical, musical, bodily-kinaesthetic, spatial, interpersonal, and intrapersonal intelligences.
11. In education, a core curriculum is a curriculum, or course of study that is deemed central and usually made mandatory for all students of a school or school system.
12. The advantage of core curriculum is that by taking upper-level courses beyond core improves the achievement of all students, irrespective of gender, family income, and racial/ethnic background.
13. According to the participatory development approach adopted by NCERT, the NCERT curriculum framework is developed on a consensus basis; all the states and union territories are involved in the curriculum elaboration.

**1.9 QUESTIONS AND EXERCISES**

**Short-Answer Questions**

1. Enumerate the prescriptive definitions of curriculum.
2. Write a short note on the nature of curriculum.

NOTES

3. What are the important assumptions with regards to curriculum?
4. State the social forces which affect educational processes and purposes.

**Long-Answer Questions**

1. Discuss the scope of curriculum with the help of an example of social studies.
2. Explain the different principles of curriculum development.
3. Describe the various philosophies linked to education.
4. Evaluate the different theories of learning.
5. Discuss the role of society as a whole on curriculum development.

**1.10 FURTHER READING**

Ornstein, Allan C. and Hunkins, Francis P. 2004. *Curriculum—Foundations, Principles, and Issues*. Boston: Allyn and Bacon.

Taba, Hilda. 1962. *Curriculum Development: Theory and Practice*. San Diego: Harcourt, Brace & World.

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Chauhan, S. S. 2009. *Innovations in Teaching Learning Process, 1E*. New Delhi: Vikas Publishing House Pvt. Ltd.

Dewey, John. 2010. *The Child and the Curriculum: Including the School and Society*. New York: Cosimo, Inc.

**Website**

<http://www.unesco.org/new/en/education/themes/strengthening-education-systems/quality-framework/technical-notes/different-meaning-of-curriculum/>

# UNIT 2 CURRICULUM DEVELOPMENT

## NOTES

### Structure

- 2.0 Introduction
- 2.1 Unit Objectives
- 2.2 Concept of Curriculum Development
  - 2.2.1 Process of Curriculum Development
- 2.3 Formation of Aims and Objectives and Learning Experiences
  - 2.3.1 Formulating Objectives
  - 2.3.2 Identification of Learning Experiences and Activities
- 2.4 Selection and Analysis of Content
- 2.5 Summary
- 2.6 Key Terms
- 2.7 Answers to 'Check Your Progress'
- 2.8 Questions and Exercises
- 2.9 Further Reading

## 2.0 INTRODUCTION

The process which involves designing and developing of integrated plans for learning, design of implementation of the plans, and its evaluation is known as curriculum development process. It also includes their implementation and the outcomes of the learning experience. This unit discusses the above-mentioned concept in detail, along with formulation, analysis, and selection of content.

## 2.1 UNIT OBJECTIVES

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

- Explain the concept and process of curriculum development
- Discuss the formulation of objectives and learning experiences
- Describe the selection of content and its analysis

## 2.2 CONCEPT OF CURRICULUM DEVELOPMENT

In developing a curriculum, we need to have appropriate mechanisms to ensure quality, conformance with common standards as well as a national democratic vision. The curriculum is actually a conceptual structure for decision-making. This structure requires the following:

- Principles on the basis of which content is selected
- Detailed ways of working with the students
- Classroom organization
- Actual teaching-learning material
- Stage specific objectives that would imply concepts, skills, values, attitudes etc., which could be organized into a body of knowledge for a particular stage of development

Figure 2.1 shows the development of the curriculum or the curriculum framework.

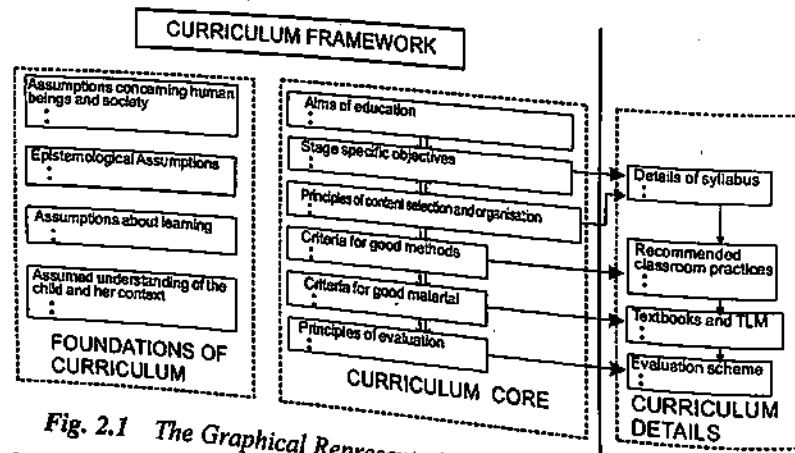


Fig. 2.1 The Graphical Representation of Curriculum Framework

(Source: Curriculum, Syllabus and Textbooks Position paper National Focus group-NCERT)

The curriculum details provide the teacher with a rationale for choosing certain practices. These practices could be related to the larger goals of education. This helps the teacher to see the connection between theory and practice. Usually, when teachers start working with students, they have some content, they have some methods, and they draw up some indicators to show that learning has taken place. However, we must keep in mind that most teachers look at a textbook as the curriculum and the syllabus and feel that it has to be taught and is the only material to be taught. This then becomes a mundane activity, which does not contribute to the child's growth.

It needs to be understood that textbooks are tools—conventional mechanism to collect and put together information required to be learned by students. As mentioned in *Curriculum, Syllabus and Textbooks Position Paper*, National Focus Group-NCERT, the two important conditions that enable teachers to look beyond the textbooks are as follows:

- (i) What the children are expected to learn
- (ii) The awareness of conceptual difference between the syllabus and the textbooks

**Curriculum Determinants**

Curriculum determinants include a large number of assumptions. These foundational assumptions on which a curriculum framework ought to be based must be consistent, clearly articulated, and acceptable to all stakeholders. These assumptions can be put into the following four overlapping groups:

- Assumptions concerning human being and society or socio-political assumptions
- Epistemological assumptions
- Assumptions about learning
- Assumptions concerning the child and its context.

These assumptions can be further discussed as follows:

**Assumptions concerning human beings and society or socio-political assumptions**

This group of assumptions is the most important one and must be agreed upon by all the stakeholders. A typical foundational statement in this area could be:

'Education should aim at a pluralistic democratic society based on justice, equity and freedom.' When a curriculum states an assumption related to human life and living together, it is said to be politico-ethical in nature.

**Epistemological assumptions**

The main fulcrum of all educational endeavours is knowledge in its widest sense. This includes understanding ways of thinking, values, and skills. 'The issues of selection of knowledge to teach, their ordering, integrated versus subject-wise curricula, the information versus knowledge versus abilities debate, etc., heavily rely on the epistemological assumptions.'

**Assumptions about learning**

This looks at how children learn best and coined phrases like 'child-centred learning,' 'activity-based learning', and 'joyful learning' on which classroom practices should be based. It is accepted as part of the curriculum.

**Assumptions concerning the child and its context**

The main significance of this assumption lies in bringing the immediate socio-cultural aspect and the psychology of learning on one platform. This helps us to understand the terminology of 'curriculum framework,' 'curriculum,' 'syllabus,' 'textbooks', and 'teaching-learning transactions.'

**2.2.1 Process of Curriculum Development**

The task of developing a curriculum is highly complex, and involves several steps. The sequence of these steps needs to be logically determined. Curriculum development is possible only on the assumption that there is an orderly sequence in approaching this task. All the decisions need to be made and carried out in a systematic order for developing the curriculum. The very nature of learning facilitates the orderly sequence of developing curriculum in education.

The following steps determine the curriculum development in education:

- Selection, formulation, and classification of objectives
- Selection and organization of learning experiences
- Evaluation of learning
- Implementation of evaluation results

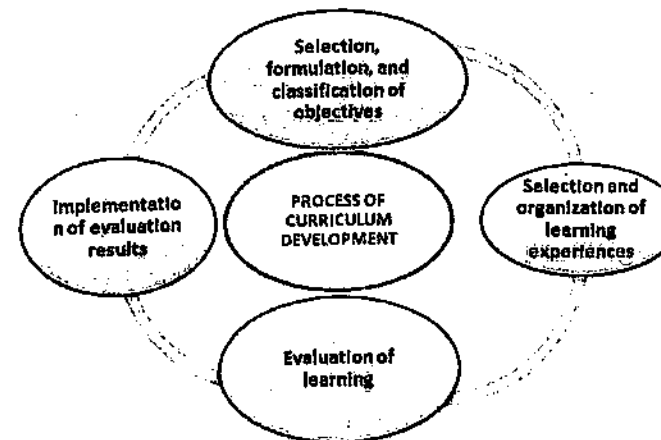


Fig. 2.2 Process of Curriculum Development

**NOTES**

**Check Your Progress**

1. State the two important conditions that enable teachers to look beyond the textbooks.
2. Name the assumptions which should be involved in curriculum framework.

**NOTES**

## 2.3 FORMATION OF AIMS AND OBJECTIVES AND LEARNING EXPERIENCES

### NOTES

In any process of curriculum development, contemporary thinking in education plays a very significant role. All over the world, curriculum is both a policy and a technical issue. It is both a process and a product. The process of developing a curriculum for any subject is unique to the national setting. 'It is a complex outcome of the opinions and solutions that key stakeholders propose for society's requirements and needs'. There have been different processes adopted for designing the curriculum.

#### Assessing needs

Teaching and learning have a definite purpose. We have to assess what is needed in order to carry out these activities in an unhindered manner. Major questions that help us decide about the educational needs are as follows:

- What part of the curriculum or course content does the topic fit?
- Why is the topic required?
- What are student requirements?
- What should be the outcome of the topic?
- Define the objective of the topic.

In simple terms, aim is purpose or intention of the desired outcome. It can also be understood as the starting point, a declaration of educational intention and direction for the subject. To exchange a few words with students about what a topic is intended to do is a fine educational practice. When preparing declarations of aims, words play a significant role. The statement should be able to define the required characteristics of what the topic means to do.

#### Developing the topic description

Topic description involves the explanation of ideas and essential educational traits of a topic. This is usually not the first set of information that students may encounter. This influences the first impression that students get and can easily change enrolment decisions. The main question that arises in terms of topic description is: What is the relevance of the topic's elements in attaining the topic aim? This phase results in the creation of a detailed statement which defines the precise characteristics of the scope of the topic.

#### Detailed topic design

Detailed topic design states the common structural and administrative parameters of a topic. Students should be provided with the detailed design in the topic booklet and Statement of Assessment Methods (SAM).

#### Students

Students are the focal point of any type of learning experience. Different students bring different learning experiences to any kind of learning environment. The character of the student association has significant effect on what is to be achieved in a topic of a particular size. Comprehensive design needs to keep in mind matters pertaining to educational setting, cultural variety, and inclusive teaching.

With regards to student associations, the following questions need to be asked:

- (i) What environment and level of knowledge are they required to bring to the topic concerning:
  - (a) Academic skills, practices, and conventions
  - (b) Knowledge and culture of the discipline or field of study.
  - (c) Cultural and behavioural knowledge
- (ii) The pre-existing skills and knowledge required for a student to be successful in acquiring the intended learning result of the topic.

The probable entry competencies need to be made clear to future students, and if required, mechanisms should be put in place to help realize those competencies.

### 2.3.1 Formulating Objectives

In everyday English, we have a tendency to use the terms aims, goals, or objectives interchangeably. However, within the educational lexicon, curriculum scholars, planners, and administrators have been trying to regulate terms so that they refer to exceedingly specific components of a curriculum. The following definitions are generally accepted by groups trying to regulate curricular terms in order that they are not confusing to readers and users:

- **Aims:** These are common statements that offer direction or intention to educational deed. Aims are more often than not written in nebulous terms using words such as: learn, know, understand, and appreciate. These are not straightforwardly measurable. Aims may serve as organizing doctrines of educational course for more than one grade. Indeed, these organizing doctrines may include the continuum of educational course for whole programmes, subject areas, or the district. For example, students will appreciate and become capable at identifying the diverse types of spoken English.
- **Goals:** These are statements of educational intent which are more particular than aims. Goals too may encompass the whole programme, subject area, or manifold-grade levels. They may be in nebulous language or in more particular behavioural terms. For example, students will be able to recognize and use Indian slang terms and phrases. (This example is a subset of the aforementioned aim, but the area [India] becomes more specific. The objectives related to this goal should specify how the students will identify and use new knowledge.)
- **Objectives:** These are more often than not specific statements of educational intent which define either general or specific outcomes. There are advantages and disadvantages of different kinds of objectives.
  - o Behavioural objectives
  - o Holistic objectives
  - o Non-behavioural objectives
  - o Problem-solving objectives
  - o Expressive activities that result in meaningful results

For example, objectives can be written in many ways. At present, most objectives are written in behavioural terms. Behavioural objectives commonly use observable verbiage and can be divided into explicit domains — cognitive, affective, and physical.

### NOTES

## NOTES

**Samples**

- **Cognitive:** Students will recognize and list five slang terms they have heard from their peers.
- **Affective:** Student will select three of the most offensive slang terms from a list developed by the whole class.
- **Physical:** Students will create communicative gestures to go with their favourite slang terms.

**2.3.2 Identification of Learning Experiences and Activities**

It is important that detailed deliberation of learning and teaching interaction are in line with educational objectives and proposed learning results for the topic. Teaching should convey and represent the values that are expected in the end in order to assist and enhance learning.

The following basic questions need to be answered when selecting a learning experience:

- What method will contribute to achieve the main objective of the topic? For instance, should one use problem-based learning, work-integrated learning (WIL) or group-based learning?
- How can teaching be applied to attain student learning in terms of the projected learning results?

While selecting a teaching method along with learning-teaching interactions, the following factors need to be kept in mind:

- Aptness for the learners and comprehensive teaching
- Resources required to facilitate and sustain student learning, for instance, text books.

There are a number of strategies that can help to enhance greater learning for students. It has been observed that students are bound to study more when:

- They are more enthusiastic and energetically involved in education
- They are aware regarding their preference of learning
- They are able to apply their learning in real-life situations
- They are effectively on a regular basis with staff and other students

**Organization of learning experiences and activities**

In simple terms, learning outcomes may be defined as the features and abilities that a student should possess on completion of a topic. The main purpose of learning objectives is to evaluate progress and prepare evaluation strategies and methods for future use. Learning outcomes are seen as signposts with respect to suitable content and learning interactions in order to assist students to achieve results.

The main questions that are required to be asked with respect to the results of intended learning are as follows:

- What is the expected result of the student's learning experience in the following areas:
  - Discipline
  - Awareness

## NOTES

- Application of knowledge
  - Course competencies including basic skills
  - Student development at the beginner's level
- What is the correct balance across the intended result?
    - Words, in particular verbs, matter when it comes to developing and recording proposed outcomes.
    - Learning outcomes are the abilities that a student should possess on completion of a topic.

**2.4 SELECTION AND ANALYSIS OF CONTENT**

Content is defined as the subject or topics that are covered in a book or a document. Content is more than simple knowledge and therefore selecting proper content requires achieving a fine balance between subject knowledge, process skills, and the growth of a student as a learner. While selecting content, it is also essential to specify context. The following questions need to be kept in mind during the selection of content:

- What type of knowledge (ideas, concepts, interpretations, and application) should be added to attain intended learning results?
- By the end of the topic discussion, what process knowledge and skills should a student acquire?
- At the end of the topic, what context in the discipline should a students achieve?
- What is the correct balance of content in terms of knowledge/skills, processes/values, and depth/breadth?
- How can global perspectives be included in the topic?

Once the content has been finalized, it is essential to organize the content in terms of scope and sequence. When deciding the scope of the content, time is considered to be a key factor. Time is also relevant in confirming the balance between breadth and depth. Integration is also a significant factor pertaining to scope. It has been seen that students learn more when they are able to connect new content with previous knowledge. Students understand better when they are able to apply their knowledge in real-life situations. Content selection is considered to be incomplete when everything has been stuffed in, rather than taken out without compromising the reliability of the topic as a learning experience towards the planned learning results.

Evaluation or analysis is an indispensable component of curriculum planning and the advancement process. We can give a broad definition of curriculum evaluation as a process of delineating, obtaining, and providing information that is useful for making decisions about curriculum development and implementation.

On curriculum development in education, two aspects of evaluation are mentioned as part of the process of curriculum development. The students of education need to understand the purposes of evaluation, and how the evaluation can be done. Modern trends in formal education have made the evaluation highly complex, both in its purpose and use. Today, a teacher in a college is required to know why a particular evaluative instrument should be used, and also how that particular instrument could be made, used and how the results could be interpreted. At times, the evaluative instruments are not

**Check Your Progress**

- What does detailed topic design state?
- Define content.
- What are the 'aims' in the context of curriculum designing?

properly made by the teachers, or the instruments, if properly made, are not used correctly and, therefore, they do not give reliable results. To prevent such mistakes the knowledge of evaluation is absolutely essential for every student, who aspires to be a teacher. Evaluation has become a major concept in education now; and the need and the functions of evaluation, as well as the characteristics and types of selected evaluative instruments have to be properly understood.

### The need for evaluation

Three different dimensions of evaluation are depicted through the modern concept of evaluation and are as follows:

- (i) The attempt to evaluate a wide range of behavioural objectives instead of mere knowledge regarding the subject matter.
- (ii) A number of evaluating instruments are put to use depending upon requirement, availability, and application of the instrument, along with the skills of a teacher in using them. Tests, questionnaires, and interviews are some of the instruments used in evaluation.
- (iii) The process of evaluation involves the integration and interpretation of different behavioural aspects into a whole, or into an inclusive picture of a student, or of a class of students as may be required.

Evaluation is therefore the measurement of selected knowledge, skills, attitudes and values for finding behavioural changes in the students. As Wrightstone mentions, evaluation emphasizes broad personality changes and involves three broad steps:

- Identifying and formulating objectives
- Defining these objectives in terms of behaviour to be realized by the students
- Selecting or making valid, reliable, and practical instruments to assess the behaviour of the students

The major purposes of evaluation can be summarized as follows:

1. To check the effectiveness of teaching programmes.
2. To check the effectiveness of the educational institution as a whole.
3. To assess the progress of the students.
4. To select students for higher courses, specialization at under-graduate and post-graduate levels, and for jobs.
5. To indicate points and levels of improvement.
6. To validate and verify the hypotheses upon which a teacher bases their teaching and evaluation of students.
7. To guide the students in removing their weaknesses as reflected in the evaluation.
8. To provide certain psychological security to the school staff, students, parents of the students, and the community at large.
9. To help both teachers and students to see their objectives.
10. To help teachers to improve, or change, their methods of teaching and evaluation.

### Characteristics of evaluative instruments

The characteristics of an effective evaluative instrument are, in general, its adequacy, efficiency, and consistency. These three characteristics depend upon the qualities called validity, reliability, objectivity, norms, and practicability

Cronbach (1963; 673) distinguishes three types of decisions for which evaluation is used:

1. **Course improvement:** Deciding what instructional material and methods are satisfactory and where change is needed.
2. **Decisions about individuals:** Identifying the needs of the students for the sake of planning instructions, judging merit of the students for the purposes of selection and grouping and acquainting the students with their own progress and deficiencies.
3. **Administrative regulation:** Judging how good the school system is, how good individual teachers are, etc.

In measurement-based evaluation, it is argued, the function of objectives is to develop criterion-referenced, rather than norm-referenced, tests. Norm-referenced tests show how an individual performs as compared with a group. Criterion-referenced tests tell us about an individual's performance in relation to a standard.

A teacher or a curriculum developer is invited to nominate by stating his/her objectives, the standard by which they wish their work to be assessed, provided that the standard is couched in behavioural terms which make it possible to develop criterion-referenced tests. They can opt for how the curriculum is to be measured but not for how it is to be judged. They cannot, for example ask how it is to be judged. It is to be judged in the light of the measurement of the performance of students on criterion-referenced tests.

Glaser (1970) has distinguished six different educational needs and has suggested the considerations for evaluation and measurement.

1. With respect to the specification of learning outcomes, the following are required.
  - Behavioural definition of goals, evaluation progress toward these goals, and clarifying these goals in the light of evaluated experience
  - Prior evaluation of educational procedures, insuring they are in effect before assessing educational accomplishment
  - Development of techniques for criterion referenced measurement
2. The requirement for the determination of long-term individual differences related to adaptive educational alternatives of initial state.
3. For the design of instructional alternatives a key task is to be determined to measure the highest discriminating potential for allocation between instructional treatments.
4. For continuous assessment, discovery of measurements of ongoing learning that facilitate prediction of the next instructional step, is required.
5. For adaptation and optimisation, the instructional model requires (a) the detailed analysis of individual-difference by instructional treatment interactions, and (b) the development of procedures like the optimising methods.
6. For evolutionary operation, we require a systematic theory or model of instruction into which accumulated knowledge can be placed and then empirically tested and improved.



## NOTES

What happens if the curriculum for a particular grade is not revised for a long time? Almost any one of you can guess the answer. It would become obsolete, recent developments in the field will not find a place in it and it will not be effective and efficient. In order to develop an efficient and effective curriculum what should we do? We should evaluate the existing curriculum and modify it to make it more relevant. Thus, the need for evaluating a curriculum emerges from the field. In any content area, there would be developments taking place periodically and if the current changes are not incorporated, the students would be unable to know the reality. In order to incorporate recent developments and to fit them into the structure of the course, one requires analysing curriculum systematically. This scientific analysis, if followed logically, leads to curriculum evaluation.

A curriculum evaluation exercise would help us modify curriculum and improve its effectiveness. To improve the efficiency of a curriculum, one has to analyse the outputs and the inputs into educational system and make the necessary modifications as revealed by the analysis. This can be accomplished by conducting curriculum evaluation.

*There could be differences* between the intended curriculum and the operational curriculum. Intended curriculum refers to the prescriptions in the curriculum document including the operational and evaluation procedures of a course. The operational curriculum refers to the actual processes in a classroom through which the intended curriculum is transacted. There could be differences between what is intended and what is implemented. To reduce this gap and bring it to a reasonable level of acceptance, curriculum evaluation can again be helpful.

### Importance of curriculum evaluation

The following are the main purposes of curriculum evaluation:

- **To develop a new curriculum:** To make objective decisions on the development of the new curriculum, evaluation of the existing curriculum is necessary.
- **To review a curriculum under implementation:** It may be required by policy planners and decision-makers to get an immediate feedback on the implementation of a curriculum in order to make amendments, if required, for effective realization of all the objectives related to it. A curriculum evaluation exercise would be necessary for this purpose.
- **To review a curriculum under implementation:** It may be required by policy planners and decision-makers to get an immediate feedback on the implementation of a curriculum in order to make amendments if required for effective realisation of all the objectives related to it. A curriculum evaluation exercise would be necessary for this purpose.
- **To remove 'dead wood' and update an existing curriculum:** It is essential to remove obsolete ideas and practices from a curriculum and include current development in the curriculum. In order to make objective decisions about inclusion or deletion of content or practices, a curriculum evaluation exercise would again be necessary.
- **To find out the effectiveness of a curriculum:** To make an objective evaluation of the effectiveness of a curriculum in terms of the achievement of its immediate as well as long-term objectives, a curriculum evaluation exercise would be essential. This evaluation is different from the evaluation of the students of a

course for the purpose of certification. The difference is that curriculum evaluation is more comprehensive and includes student evaluation plus the feelings generated among the students regarding appropriateness of the various components of the curriculum.

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### Sources of curriculum evaluation

Some of the sources of curriculum evaluation are:

**(a) Students:** The students of a particular course are the primary and most important source of information regarding how relevant the intended curriculum is and how well it is being implemented. The list of the output specifications can be given to the students who are undergoing a particular course and detailed information can be gathered in two ways.

- By finding out whether the students have really achieved the intended output specifications or they have achieved the objectives of the course. Information is generally gathered through the evaluation system as prescribed in the curriculum for certification purpose and is mostly quantitative in nature.
- By finding out the perceptions of students regarding the extent to which they feel they have achieved the objectives of the course. This information is more qualitative in nature as these are the perceptions of students and they are of immense value from the point of view of revising the curriculum.

**(b) Teachers:** Curriculum review/evaluation should be done by the teachers in the school. However, the involvement of others cannot be denied. The teachers are part of the curriculum in the sense that they transact the curriculum in the class. They can give valuable information regarding the implementation of the curriculum. The teachers are valuable agents of curriculum evaluation. Teachers, who are not currently teaching the subject but have sufficient content knowledge and background information on a particular curriculum, can also be helpful in curriculum evaluation in addition to those teachers who are currently implementing the curriculum.

**(c) Subject experts:** To get balanced information on the implementation of a curriculum, especially from the disciplinary point of view, it would be worthwhile to consider the views of other subject experts in the field as relevant and reliable. The subject experts could be from other systems like a practitioner in the field or even a self-employed person. The experts will provide valuable information on the field conditions which would be of tremendous value for the purpose of curriculum evaluation.

**(d) Curriculum experts:** Curriculum experts can provide information on the modern techniques used for developing a curriculum, so that it becomes more meaningful from the student's point of view. In the meaningful curriculum, the output specifications are made clear, the conditions under which they will be observed, and the level of acceptance of errors.

**(e) Policy Makers:** Policy makers occupying responsible positions in apex bodies like Central Board of Secondary Education (CBSE), National Council of Educational Research & Training (NCERT), National Open School (NOS), and State Boards of Secondary Education are also excellent sources of information for curriculum evaluation. By virtue of their position they are better informed about the current scenario and can envisage changes in government policies regarding economy, industry, agriculture, and education. All these areas have direct or indirect implications for school curriculum.



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**(f) Community:** The local community, where the products (educated/trained persons) of a particular course are to be absorbed, can be yet another important source of information for curriculum evaluation. The requirements of the local community can make the curriculum relevant and need-based. A curriculum revised on the basis of needs and requirements of the community will be able to serve the cause of the community better by producing socialized and more responsible citizens.

**(g) Dropout sample:** Those students who have dropped out of a particular course can be yet another valuable source of information for curriculum evaluation. These students can pin-point the curricular factors that might have been responsible for their withdrawal from the course.

**(h) Employers and entrepreneurs:** The opinion of the employers, who have to absorb the products of these courses, can also reflect on the strengths and weaknesses of the curriculum. Those who are self-employed, even in the unorganized service sector, can provide valuable information on the strengths and weaknesses of a particular curriculum.

### Methods of curriculum evaluation

Curriculum evaluation can be done by an external agency or by insiders (those who are involved in the planning and development of the curriculum or by a combination of both of the groups). A combination of outsiders and insiders would be preferable to get a comprehensive and objective evaluation. The methods of evaluation vary from a questionnaire-based evaluation to evaluation based on unstructured interview. The method of collecting information would depend on the objective of evaluation. When we require more qualitative descriptions of the implementation of the curriculum, unstructured or structured observations can be used. When we require quantitative data regarding various aspects of a curriculum being designed, a check-list can also be used. Similarly many other techniques can be used depending on the purpose of evaluation and the stage of evaluation that is, whether evaluation is being done at the development stage or at the implementation stage. Curriculum evaluation at the planning stage is mostly confined to job analysis or task analysis. Similarly, the content analysis that follows also requires the support of formative evaluation. These exercises are usually not practiced in schools and so the curriculum suffers from several drawbacks. A well prepared school curriculum should also accommodate an evaluation cycle at the planning stage.

### Evaluation during curriculum development

One of the major tasks during the development of a curriculum is to prepare an exhaustive list of specific objectives, which are to be achieved through the curriculum. Once the list is prepared, it has to undergo an evaluation cycle. The list may be supplied to a set of practicing teachers for their specific comments, additions, and deletions, if any. In addition to working teachers, information from other individuals like prospective employers of the products, the next higher grade teachers, a group of prospective students, planners and administrators can be given to check whether the entry behaviour of their grade suits the output specifications or not. Based on the feedback collected from the evaluators, the objectives can be modified.

A second major task, which requires the support of an evaluation exercise during the development of a curriculum, is the instructional materials that have been prepared

## NOTES

to achieve the objectives. These materials have to be tried out on a sample of students for their feedback on their learning routes and difficulties. A field tryout with a small sample is ideal in getting adequate evaluation information from a sample. This can be used for further improvement of the material. Data collected from the inbuilt evaluation of the learning material can also be used in modifying the learning material. Curriculum material here refers to all learning materials which included textbooks, self-learning text, audio and video programmes, teacher's manual, assignment questions, project work, etc. Similarly, the evaluation procedures to be adopted during curriculum development also need a tryout and possibly further modification based on data collected through the tryout.

### Evaluation during curriculum implementation

After the curriculum has been tested and the curriculum materials are duly modified, it is important that the teachers and administrators are oriented and trained for proper implementation of curriculum. To implement curriculum without introductory or supporting courses would be quite a severe risk; it may lead to the use of new materials in unsatisfactory ways. Training of the personnel involved and the provisions of all necessary facilities and resources are essential for successful implementation of any curriculum.

Evaluation is necessary at the time when curriculum is implemented as well as after each offering of the course. The purpose of evaluation at this stage is two-fold (a) to find out the areas of support needed for effective implementation of the curriculum in schools; and (b) to control the quality of the product that is, the educated person. Important information to be collected at this stage includes:

**(a) The existing situation:** All aspects of curriculum according to the curriculum plan need to be studied in order to identify the missing features of the curriculum being implemented in the schools. A checklist, which gives all the features of the objectives and the content of the curriculum, students' characteristics necessary to begin the teaching-learning process, teachers' characteristics necessary for implementing the curriculum, basic assumptions regarding how teaching and learning should take place to ensure active participation of the students, additional materials required to implement the curriculum, organization of the curriculum with respect to time requirements and the order in which the activities and the materials are to be processed, methods of implementation of the curriculum, and evaluation of student's performance can be used to assess the discrepancies or the gaps in the implementation of different aspects of curriculum.

**(b) Effectiveness of the curriculum:** The crucial question is that determining the effectiveness of curriculum is to determine the extent to which the students attain the standards or achieve the objectives as described in curriculum planning. Thus, the effectiveness of curriculum reveals whether curriculum is able to achieve objectives set by the social system or not.

**(c) Acceptability of the programme:** In addition to assessing the effectiveness of the curriculum it is also important to assess its acceptability. Acceptability here means whether the people involved in implementing the programme like it or not. To get an insight into the acceptability of the programme, the perceptions of students, teachers, and the supervisors/ administrators of the school should be ascertained.

### Check Your Progress

6. Name the different sources of curriculum.
7. List any four major purposes of evaluation.
8. What are the two major tasks during the development of a curriculum?
9. State the purpose of evaluation at the stage of curriculum implementation.

## 2.5 SUMMARY

- In developing the curriculum, we need to have appropriate mechanisms to ensure quality, conformance with common standards as well as a national democratic vision. The curriculum is actually a conceptual structure for decision-making.
- The task of developing a curriculum is highly complex, and involves several steps. The sequence of these steps needs to be logically determined. All the decisions need to be made and carried out in a systematic order for developing the curriculum.
- The process of developing a curriculum for any subject is unique to any national setting. 'It is a complex outcome of the opinions and solutions that key stakeholders propose for society's requirements and needs'. There have been different processes adopted for designing the curriculum.
- It is important that detailed deliberation of learning and teaching interaction are in line with educational objectives and proposed learning results for the topic. In simple terms learning outcomes may be defined as the features and abilities that a student should possess on completion of a topic.
- Content is more than simple knowledge and therefore selecting proper content requires achieving a fine balance between subject knowledge, process skills and the growth of a student as a learner. While selecting content it is also essential to specify context.
- Evaluation is an indispensable component of curriculum planning and the advancement process. We can give a broad definition of curriculum evaluation as a process of delineating, obtaining and providing information that is useful for making decisions about curriculum development and implementation.

## 2.6 KEY TERMS

- **Curriculum determinants:** These are the assumptions on which a curriculum framework is based.
- **Cognitive:** It pertains to the mental processes of perception, memory, judgment, and reasoning, as contrasted with emotional and volitional processes.
- **Evaluation:** It means to examine and judge carefully or appraise.

## 2.7 ANSWERS TO 'CHECK YOUR PROGRESS'

1. The two important conditions that enable teachers to look beyond the textbooks are as follows:
  - a) What the children are expected to learn
  - b) The awareness of conceptual difference between the syllabus and the textbooks
2. The assumptions which should be involved in curriculum framework are put into the following four overlapping groups:
  - a) Assumptions concerning human being and society or socio-political assumptions

- b) Epistemological assumptions
- c) Assumptions about learning
- d) Assumptions concerning the child and its context

3. The detailed topic design states the common structural and administrative parameters of a topic.
4. Content is defined as the subject or topics that are covered in a book or a document.
5. With regard to curriculum designing, the term 'aims' refers to the common statements that offer direction or intention to educational deed. Aims are more often than not written in nebulous terms using words such as: learn, know, understand and appreciate.
6. The sources of curriculum evaluation are students, teachers, subject experts, policy-makers, community, dropout sample, and employers and entrepreneurs.
7. The major purposes of evaluation are:
  - a) To check the effectiveness of teaching programmes.
  - b) To check the effectiveness of the educational institution as a whole.
  - c) To assess the progress of the students.
  - d) To indicate points and levels of improvement.
8. One of the major tasks during the development of a curriculum is to prepare an exhaustive list of specific objectives to be achieved through the curriculum. While the second major task which requires the support of an evaluation exercise during the development of a curriculum is the instructional materials that have been prepared to achieve the objectives.
9. The purpose of evaluation at the stage of curriculum implementation is two-fold:
  - (a) To find out the areas of support needed for effective implementation of the curriculum in schools and
  - (b) To control the quality of the product i.e. the educated person.

## 2.8 QUESTIONS AND EXERCISES

### Short-Answer Questions

1. What are the requirements of a conceptual structure for decision-making?
2. Write a short note on the selection of content.
3. What are the dimensions of evaluation?

### Long-Answer Questions

1. Explain the concept and process of curriculum development.
2. Describe the characteristics of curriculum evaluation in detail along with its importance.
3. Comment on the importance of learning experiences in the process of curriculum development.

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**2.9 FURTHER READING**

- Taba, Hilda. 1962. *Curriculum Development: Theory and Practice*. San Diego: Harcourt, Brace & World.
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NOTES

**UNIT 3 CURRICULUM FRAMEWORK  
AND POLICIES**

NOTES

**Structure**

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- 3.1 Unit Objectives
- 3.2 Curriculum at Different Levels: National, State and Local
  - 3.2.1 National Level
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- 3.3 National Curriculum Framework: Features
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  - 3.4.1 Legal and Institutional Framework
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- 3.8 Answers to 'Check Your Progress'
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- 3.10 Further Reading

**3.0 INTRODUCTION**

The concept of curriculum is an oft debated issue. Each student recognizes content and concepts diversely based on their previous experiences. Yet efficient classroom learning needs more than just linking new material with old ways thinking; it involves new ways of understanding. Students require knowledge that helps them build up new views and make better sense of the world. Learning is the task of the learner but the teacher directs the student towards developing meaning from content and classroom experiences.

Education in India falls under the control of both the Union Government and the State Governments, with some responsibilities lying with the Union and the states having autonomy for others. Earlier the role of the Government of India was limited to coordination and deciding on the standards of higher education. This was changed with a constitutional amendment in 1976, so that education now comes in the concurrent list. That is, school education policies and programmes are suggested at the national level by the Government of India, though the state governments have a lot of freedom in implementing programmes. Policies are announced at the national level periodically. The Central Advisory Board of Education (CABE), set up in 1935, continues to play a leading role in the evolution and monitoring of educational policies and programmes.



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Curriculum is all encompassing and above all it is learner focussed. Many improvements have taken place in the educational system of the country over the last two decades. Many scientific discoveries are now available as tools to hasten acquisition of productive education that would be useful in contributing effectively to the development of the nation. It is therefore important that as the world progresses, the curriculum must be revised and improved. In this unit, we will discuss the curriculum at different levels, along with the concept of curriculum evaluation.

### 3.1 UNIT OBJECTIVES

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

- Discuss the curriculum at different levels: National, state, and local
- Describe the National Curriculum Framework
- Explain the nature and steps of curriculum evaluation

### 3.2 CURRICULUM AT DIFFERENT LEVELS: NATIONAL, STATE AND LOCAL

India has made progress in terms of increasing the primary education and expanding literacy to approximately three quarters of the population. India's improved education system is often cited as one of the main contributors to the economic rise of India. Much of the progress, especially in higher education and scientific research, has been credited to various public institutions.

There is a national organization that plays a key role in developing policies and programmes, called the National Council for Educational Research and Training (NCERT) that prepares a National Curriculum Framework. Each state has its counterpart called the State Council for Educational Research and Training (SCERT). These are the bodies that essentially propose educational strategies, curricula, pedagogical schemes, and evaluation methodologies to the states' departments of education. The SCERT generally follows guidelines established by the NCERT. But the states have considerable freedom in implementing the education system.

#### 3.2.1 National Level

Much development took place between 1964 and 1985 in the field of education in India. One education commission was there in this period that is, National Education Commission also known as Kothari Commission (1964-66), which was appointed by the government of India to make all-inclusive review of the educational system in order to renovate or modify the existing education. The outcome of this commission was a National Policy on Education in the year 1968. To look into the different aspects of education, three five year plans were also executed during this period. Finally, when the National Policy on Education, 1968 was evolved, many of its major recommendations were either rejected or diluted in terms of vague and non-specific suggestions, with a view to avoid all the controversies that erupted due to the commission's recommendations. The education system failed to fulfil the needs and demands of the various social groups, and empirical evidences show that this formal education system suffered from a myriad of limitations.

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India underwent many changes in the last phase of nineteenth century due to unstable government, economic crisis, and other causes. It was felt necessary to review the role of education and developments that took place in the past. The result was a status document called *Challenge of Education: A Policy Perspective* prepared by the Indian government after a deep and careful analysis.

Rajiv Gandhi, the then Prime Minister of India, on the basis of Kothari Commission, forwarded the National Educational Policy. The nation discussed and reflected upon this issue as to what should be the draft of the new educational policy that can help in the development of citizens for 21st century who can stand along with the world. The policies should be such that can fulfil the needs of the nation. Keeping this in mind, the National Policy was drafted in the year 1986 and suggestions were given for different aspects and levels of education that could be put into practice without further delay. Due to the change of government at the centre, there was an indifferent attitude towards the educational policy and a review committee was formed. This committee evaluated the practical aspects of this educational policy to judge its effectiveness and usefulness. The attitude of this committee was positive towards this educational policy.

Special features of the National policy of Education which formed the basis for the curriculum for the nation are as follows:

- The NPE 1986 contended that the role of education is essentially to transform a static society into a vibrant one with commitment, development, and change. The policy recognised the need for creating not only access to education for all sections but also getting them involved in the process of continuing education so as to promote a learning society.
- Further, the Policy also laid special emphasis on the role of education in adequately equipping the new generation stepping into 21st century with required skills and competencies.
- Following the 42nd amendment of the Indian Constitution with the authority to legislate on education concurrently with the states so far as organization and structure of education is concerned, the NPE operationally defined concurrence as a meaningful partnership between the centre and states and placed clear responsibility on the Union Government regarding the national and integrative character of education, quality and standards, manpower planning research and advanced study, culture, human resources development, and the international aspects of education.
- The NPE 1986 gave an unqualified priority for Universalization of Elementary Education and indicated a vital shift from mere provision of schooling facilities for the improvement of facilities, universal enrollment and participation and for the achievement of satisfactory levels of learning. The Policy advocated due track approach with simultaneous attention on adult literacy and primary education. While shifting its focus from enrollment per se to enrollment as well as retention and achievement, it also laid conditionality for success.
- There are some common points between the NPE 1968 and NPE 1986. They refer to the recurrence of the commitment towards a Common School System and the common educational structure of 10+2+3. The NPE 1986 has gone a step further while re-emphasizing the place of common core curriculum in the National System of Education by specifying the underlying values. They are

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India's common cultural heritage, egalitarianism, democracy and secularism, equality of sexes, protection of the environment, removal of social barriers, small family norm, and inculcation of the scientific temper.

- Another important milestone of the NPE 1986 is its commitment to laying down minimum levels of learning at each stage of education aimed to ensuring the quality of education and comparability across the nation.
- The NPE 1986 declares that the entry into the higher education and technical education would be based on the requisite merit regardless of the origin of the aspirant.
- Another important indication for the promotion of opportunity and creating learning society is found in the thrust given to open and distance learning in the policy.

The Policy proposed a three-pronged strategy to realize the task of universalization of primary education:

- Firstly, to provide a motivating school environment through child-centred and activity-based learning process at the primary stage. In this context, the policy emphasized the need for providing supplementary remedial instruction to first generation learners and allowing them to progress.
- Secondly, to improve the inputs for teaching-learning process by providing essential facilities in primary schools in terms of classrooms, teachers, and other teaching-learning equipment. The above facilities are to be delivered to all the primary schools in a phased manner under the scheme called Operation Black Board (OBB Scheme).
- Thirdly alternative stream of systematic non-formal programme is to be designed to ensure the coverage of children who dropout from the habitation without schools, working children and girls who cannot attend regular schools to ensure universalization. In order to ensure the quality of such non-formal education, efforts will be made to use modern technological aids and the services of talented local young men and women from local community with training.

With respect to the quality, the Policy proposed to formulate curriculum for inculcating values of healthy, work ethos, humane, and composite culture.

### Establishment of Navodaya Schools

For the first time in independent India, a nationwide programme of special schools under the name of pace setting schools has been proposed. Such schools are meant for talented children largely rural, who are selected with due care. These institutions are residential in nature and education is provided free of charge. Such schools have already come into existence as Navodaya Schools under the subsequent Five Year plans all over the country.

Apart from the special courses at the +2 stage, the Policy envisages appropriate flexible non-formal vocational courses for the youth, who leave the formal school at the primary stage, school dropouts, and neo-literates, with special preference to the needs of women. Provision of tertiary level vocational courses is made for those who complete their higher secondary education through academic stream and who require such courses.

### National Open School (NOS)

The National Open School was started in India by the Central Board of School Education in 1979. The objective of establishing this school was to provide alternative opportunity through distance education mode to a heterogeneous clientele comprising the rural people, urban poor, women, SC/STs, working adults, and school dropouts, who are unable to attend the formal school system. The unique features of these NOS are that it takes education to the doorsteps of motivated learners and does not impose limitations of time and place. Further, it makes provision for studying at one's pace and convenience. Various types of support services are provided to the clientele including Personal Contact Programmes through a number of accredited institutions which are located across the country. The Government of India had conferred autonomous status to NOS with administrative control vested with the Department of Education, MHRD in 1989, which was subsequently amalgamated with it in 1990. The NOS has the authority to conduct its own Secondary/Senior Secondary examinations and issue certificates.

The commencement of the Seventh Plan coincided with a comprehensive review of the policy. Accordingly, the plan provided for reorientation of the education system so as to prepare the country to meet the challenges of the next century. The main thrust areas in the Seventh Plan were:

- Achievement of universal elementary education
- Eradication of illiteracy in the age group of 1-35 years
- Vocational and skill training programmes at different levels of education
- Upgradation of standards and modernization at all stages of education with effective links with the world of work and with special emphasis on science and environment and on value orientation
- Provision of facilities for education of high quality and excellence in every district of the country
- Removal of obsolescence and modernization of technical education

The Plan also delineated effective decentralised planning and organization reforms, promotion of non-formal and open learning systems, adoption of low cost alternatives and optimum use of resources as strategies for achievement of the plan objectives.

The plan priorities for elementary education were:

- Paramount priority was to universalise elementary education, with a shift in emphasis from mere enrollment to retention of pupils in schools that is, to prevent wastage and stagnation. Another aim was achievement of basic elements of learning by them.
- Formal and non-formal methods to effectively cover girls and children of weaker sections.
- Provision of in-service training for teachers and developing and strengthening teacher training institutions.
- Promotion of girls' education through the appointment of women teachers, attachment of pre-school centres, provision of free uniforms, and other incentives.

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- Specific funds to enhance the quality and efficiency of elementary education through school building and curricular materials.
- Also, the open school systems and distance learning techniques to meet the additional demand for secondary education arising out of expansion in primary education; expansion of facilities were linked with serving the needs of girls and other backward children.
- Free education for girls up to higher secondary stages.

At the secondary stage the priorities were as follows:

- Strengthening and universalising science education through upgrading the curricula, laboratory facilities and large scale in-service training programmes for teachers.
- Strengthening vocationalisation of education programmes of Socially Useful Productive work (SUPW).
- Vocationalisation for higher education through diversification to cover a large number of fields in agriculture, industry, trade, commerce, and services. The introduction of the vocational courses was linked with emerging work opportunities, in a lithe manner.
- Extending computer literacy programme initiated during Sixth Plan and augmenting audio and video programmes at secondary stage
- In-service training of teachers for developing software and effective use of modern communication technologies and computers in education was to be promoted.
- Revision of textbooks and strengthening libraries for imparting value oriented education with a national perspective.

It should be noted that the strategy of the Seventh Plan underwent a change in the middle of the Plan period following the adoption of the National Policy on education in 1986. As a result of this the following new thrust in education was taken up (i) universal enrollment and universal retention and (ii) substantial improvement in the quality of education. The scheme of non-formal education was revised and a number of schemes for teacher education were also taken up.

### Education in India

In India education is provided by the public sector as well as the private sector, and the control and funding comes from three levels:

- Central
- State
- Local

Education in India comes under the control of both the Union Government and the State Governments, with some responsibilities lying with the Union and the states having autonomy for others. The education is provided as a fundamental right by the various articles of the Indian Constitution. Most universities in India are controlled by the Union or the State Government.

India's education system in general is divided into different levels:

- Pre-primary level

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- Primary level
- Elementary education
- Secondary education
- Undergraduate level
- Postgraduate level

The National Council of Educational Research and Training (NCERT) is the top most body that decides the formulation and implication of the curriculum related matters for school education in India. The National Council of Education Research and Training (NCERT) formulated the first Curriculum Framework in 1975 as a recommendation to the individual states. NCERT was accorded the responsibility of developing a binding National Curriculum Framework through the National Policy on Education (NPE) (1986). NCERT reviews the curriculum every five years on the basis of consultations within the whole school sector. The core areas of the curriculum are common. Teaching of English is usually compulsory in classes VI-X in most of the states/UTs. NCERT published a New National Curriculum framework in 2005.

The New National Curriculum should be introduced in textbooks in three phases:

- Phase one, 2006-07: classes I, III, VI, IX, and XI.
- Phase two, 2007-08: classes II, IV, VII, X, and XII
- Phase three, 2008-09: classes V and VIII

NCERT has gradually been changing the curriculum from providing traditional information to be more learner-oriented and competence-based. A number of schools in India are provided support and technical assistance by the NCERT and it oversees many aspects of enforcement of education policies.

The range of curriculum bodies leading and controlling school education system in India is:

- The state government boards are the most important ones, in which the majority of Indian children get enrolled.
- The Central Board of Secondary Education (CBSE) conducts two examinations, specifically, the All India Secondary School Examination, AISSE (Class/Grade 10) and the All India Senior School Certificate Examination, AISSCE (Class/Grade 12).
- The Council for the Indian School Certificate Examinations (CISCE) conducts three examinations, namely, the Indian Certificate of Secondary Education (ICSE - Class/ Grade 10); The Indian School Certificate (ISC - Class/ Grade 12); and the Certificate in Vocational Education (CVE - Class/Grade 12).
- The National Institute of Open Schooling (NIOS) conducts two examinations, namely, Secondary Examination and Senior Secondary Examination (All India) and it also conducts some courses in Vocational Education.
- International schools affiliated to the International Baccalaureate Programme and/or the Cambridge International Examinations.
- Islamic Madrasa schools, the boards of which are controlled by the local state governments or they can be autonomous, or affiliated with Darul Uloom Deoband.

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- There are many autonomous schools functioning in India like Woodstock School, The Sri Aurobindo International Centre of Education Puducherry, Auroville, Patha Bhavan, and Ananda Marga Gurukula.

In addition to the above, NUEPA (National University of Educational Planning and Administration) and NCTE (National Council for Teacher Education) are also accountable for the execution of the education system and teacher accreditation.

National standards give state and local committees a direction and focus as they take the responsibility of critically important task of curriculum design. Key concepts and principles, critical content knowledge, and major processes and skills necessary for the various disciplines are acknowledged from the national documents. The national standard documents, in most of the situations, provide a wealth of background knowledge and information to support educators in the field as they educate indispensable knowledge and skills. To reconceptualise both curriculum and instruction in reply to our quickly changing society, there is need for the teachers to develop in-depth conceptual and content knowledge across the disciplines. The national standards are a helpful and valuable resource for teachers as they practise a deeper understanding of their disciplines.

### Curriculum of primary education in modern India

The 10+2+3 pattern of education was declared in the National Education Policy, 1968 and the National Council of Educational Research and Training (NCERT) prepared a Core Curriculum for the first 10 years of education in 1975. In the meantime some provinces prepared their curriculum for first ten years of education on the basis of this core curriculum. The National Education Policy, 1986 emphasized the implementation of the 10+2+3 pattern of education compulsorily in the whole country. The National Council of Educational Research and Training (NCERT) published a new framework of core curriculum for the first ten years of education in 1988. This Core Curriculum was yet to be implemented in November 2000, but NCERT presented another new framework of core curriculum for the first ten years of education. In the National Policy on Education, 1986 it was declared that the curriculum for any level of education would be revised after every five years. In accordance with that, NCERT presented a new framework of school curriculum in 2005 in which the curriculum for the first eight years of education would be:

#### A. Class I to V

- Mother-tongue (regional language)
- English
- Mathematics
- Environmental Studies
- Art and Craft
- Health and Physical Education
- Work Education

#### B. Class VI to VIII

- Mother-tongue (regional language)
- Modern Indian language
- English

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- Science and Technology
- Mathematics
- Social Sciences (History, Geography, Civics, Economics)
- Art Education
- Health and Physical Education

The speciality of this curriculum framework is that besides what to teach, it has also been made clear in it, that why to teach, how to teach and what should be the result of teaching it. Though this curriculum has not been followed in most of the provinces in its true form, yet the study of English has been made compulsory from class five in twenty-five provinces.

### Advantages of the primary education curriculum

**(a) Primary education is the foundation stone of education:** The medium of communication, language is taught to the children in primary education. They are trained in general human behaviour and reading skills and their power of visualization and comprehension is developed. These are the means to acquire education. Thus, primary education acts as the foundation stone for secondary and higher education. If this foundation stone is laid properly, the secondary and higher education run smoothly.

**(b) Primary education is the basis of personality development:** The psychologists have arrived at the conclusion that personality of a person is shaped mostly in childhood, three-fourth of it is shaped at this stage. The future of a child depends on the type of foundation laid at this stage. The children step in primary schools carrying over the culture and traditions of their family. However, children are not so resistant that they cannot be moulded according to a new environment. It is in the primary schools that the social, cultural, moral, and character development of the children take place. They are trained in human behaviour and in this way their personality is shaped.

**(c) Primary education is mass education:** At present, primary education is free and compulsory in every country. The word compulsory in this context means a minimum of this much (primary education) should be acquired by everyone. The education which is compulsory for everyone is generally termed as mass education. That is why, it is later on provided in the form of adult education to those adults who fail to acquire it in their childhood. If this decree of compulsion is followed strictly, it will definitely change the form of adult education; it will take the form of continuing education in place of literacy mission.

**(d) Primary education is the education of common life:** When it is said that primary education is mass education and it is an education for all, then it means that in primary education everyone is educated to live a general life. Higher education prepares us for the different fields of life. From this point of view also, primary education is important for any society.

Primary education is a complete education for 40 per cent of people in India. In our country, primary education from class I to VIII is free and compulsory, it is observed that for about 40 per cent of the children, this primary education is complete education. From this point of view, primary education becomes all the more important in India.

### Problems or shortcomings of primary education in India and their remedies

In 1947, the condition of primary education in our country was poor and many problems existed in this field. Continuous efforts have been made to solve those problems



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and we have succeeded in overcoming some of those problems, but the ones which exist are:

1. Core curriculum for primary education has been developed, but still it has not been implemented in its full sense yet.
2. The aims of primary education are being fixed and made clear in the curriculum but with the emergent need of the time some changes are bound to occur, therefore curriculum should be updated regularly.
3. With the change of time many good methods of teaching have been developed and teachers are being trained in them, but the irony is that the teachers rarely use them.
4. It has now been decided that primary education will be imparted through regional languages. Of course, scheduled tribe children whose mother-tongue and the regional languages are different, will be educated through their mother-tongue in the first two years and with the third year onwards through the regional languages. At the same time, the English medium primary schools will keep functioning. In this way, there is now no problem about the medium of education at the primary level. But it should have its practical implementation.
5. In the meantime, a large number of male and female teachers have been trained for primary schools. At present, there is no shortage of trained male and female teachers in the country, the only delay is in their appointment.

### Curriculum of secondary education in modern India

After the declaration of the National Education Policy, 1968, NCERT prepared the framework of core curriculum for the first ten years of education in 1975, and after the declaration of the National Education Policy, 1986, it presented its new framework in 1988. This core curriculum was yet to be implemented properly in the country that NCERT in 2000 prepared another framework of core curriculum for the first ten years of education along with the curriculum for +2 levels. In the National Policy on Education, 1986, it was declared that the curriculum of any level of education would be revised after every five years. In accordance to it, NCERT presented a new framework of school curriculum in 2005 in which the secondary level curriculum was as follows:

#### Secondary level (Class IX and X)

1. Mother tongue (regional language)
2. English
3. Sanskrit/Urdu/Other language
4. Mathematics
5. Science
6. Social Studies (History, Geography, Sociology, Civics, Economics)
7. Computer
8. Work Education
9. Peace Education
10. Art Education

In this curriculum, besides what to teach, it has also been made clear that why to teach, how to teach, and what should be the result of it. In this curriculum the study of

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three languages has been made compulsory. We find no logic behind it. In our opinion only the study of mother tongue should be compulsory and the study of any other language should be optional. Moreover, the subjects like peace education should not be introduced at this stage.

### Need and importance of secondary education

There is a great difference in the psychology of infants, children, adolescents, and adults. It is on the basis of their psychology that education is divided into different levels, namely - pre-primary (infant), primary (child), secondary (adolescent) and higher (adult). The aims and the curriculum for different levels of education are fixed differently. Secondary education is the education for adolescents; it is a formative education for them and herein lies its need and importance.

1. **Secondary education is a complete unit in itself:** Although secondary education is a connecting link between the primary and the higher education, but in any country only a handful of students join higher education and it is for this reason that the education of the secondary level is developed as a complete unit. On its completion, most of the youths enter the world of work and earn their livelihood by working in farmlands or in different vocations. This is the reason that education up to secondary level is compulsory in all developed countries. At present, in our country, the goal is to make the education from class I to VIII free and compulsory, but in the 10+2+3 education structure, the goal is to make the first ten years of education free and compulsory.
2. **Secondary education is the basis for the development of manpower of any nation:** At the primary level, only general information is provided to children and they are trained in social etiquettes and behaviour, but at the secondary level they are made a complete man, their ability to think and judge and to do work is cultivated and in this way, the manpower of a country is developed. Thereafter, through higher education, only the intelligent students are developed in the form of specialised human resources.
3. **Secondary education is the constructive and citizenship education of children:** At the secondary level, adolescents study. This is a very crucial phase in human development. It is the time period which marks the growth of human being. If the feeling of responsibility for the society and country is developed among them at this age/level, they may prove to be a good member of the society and good citizen of the country. To provide proper direction to restless adolescents and to help them proceed in proper direction is one of the most important tasks of secondary education.
4. **Secondary education is the basis for higher education:** Secondary education is the basis of higher education, after its completion the students enter into higher education and prepare themselves to work in different specialized fields of life. In case if their mental level is not developed through secondary education and the habit of study and hard work is not inculcated among them, they fail to achieve higher education.
5. **Secondary education for most people in India is complete education:** For a vast mass of population, in any country, secondary education is a complete education and only the intelligent and able students go for higher education. It is for this reason that secondary education in most countries of the world is developed as a complete unit, such that it may develop the personality of children and may make them proficient in some vocation and prepare them as a common citizen.

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The reform in secondary education in India began during the British rule. After achieving independence, our Government appointed Secondary Education Commission (Mudaliar Commission) in 1952 to suggest measures to reform the Secondary Education. This commission carried out an in-depth study of the existing secondary education and found the following demerits in it:

- Aimless secondary education
- Improper curriculum at secondary level
- Lack of uniformity in education at the secondary level
- Improper training of the secondary school teachers
- Defective examination system at the secondary level
- The 10+2+3 pattern of education is now accepted all over the country. Now, there is no problem of the uniformity of secondary education. The aims of secondary education have also been specified, so no problem of aimlessness seems to exist at this level, though it is a different thing that most of the teachers do not make effort to achieve these aims.
- The core curriculum for the first ten years of education has been prepared and the guideline framework for +2 has also been prepared. But its nature in different provinces is different.
- Many reforms have taken place in the text books of secondary level. Their standard has risen. But along with it, Question-Answer books are also being continued which causes confusion.
- Useful reforms have been introduced in the training programme of secondary teachers. Though it's a different thing that whether trained diploma or degree holder teachers derive benefit from it or not.
- The use of new methods and techniques of teaching has begun, but again their use is confined to a few specific fields only.

In the meantime, much reform has taken place in the field of examination and evaluation system at the secondary level. As, reform is a continuous process it should be carried out regularly.

### Curriculum of higher education in India

Higher education in India was started in Vedic period, but before the advent of Europeans its curriculum was limited to the teaching and learning of language, literature, religions, philosophy, logic, ayurvigyan and different arts and crafts. The inclusion of European knowledge and science in it was first of all declared in Wood despatch, 1854. Thereafter, the Indian Education Commission (1882) and the Calcutta University Commission (1917) recommended to broaden it further. As a result, courses in Law, European medical system and engineering, etc. were started in the field of higher education in the country in every subject. The University Education Commission (1948-49) gave detailed suggestions in relation to the courses of higher education. Some of the major suggestions were:

- Graduate courses should be of three years
- Course of every subject at the graduation level should be widened
- At the graduation level, the national language Hindi, English, General Education and Religious Education should be made compulsory

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- At the post graduate level, there should be an intensive study of one subject only
- Courses of scientific, vocational, and technical subjects should be widened and updated

Kothari Commission (1964-66) supported these suggestions and suggested to adopt an inter-disciplinary approach in the courses. The commission clarified that all knowledge is related to our life and is a complete unit from this point of view. It further clarified that in spite of specialization, there are many such facts which one finds in every subject. Therefore, courses should be prepared in such a way that besides providing knowledge of any one subject (discipline), it should also clarify the facts of other subjects. This is termed as Interdisciplinary Approach in the field of education. On its suggestion, the University Grants Commission established 27 Curriculum Development Centres in the country, to restructure the curriculum of higher education. On the basis of the interdisciplinary approach, the curriculums of humanities, social sciences, and science subjects were prepared at these centres.

In the National Education Policy, 1986, it was declared that the present curriculum of higher education will be reformed, widened, and updated. In the plan of action of this policy, it was stated that the model curriculum prepared by the Curriculum Development Centres will be implemented and at the same time it was also stated that the curriculum of higher education will be reviewed every five years. In the meantime, some universities have widened and updated their curricula, made them of international standard and have also made them activity-oriented.

Currently, higher education is on the concurrent list in the Indian constitution, meaning that it is a shared responsibility between the Union or Central Government and the State Governments. The Department of Secondary and Higher Education is placed within the Ministry of Human Resource Development. There is also a Department of Education in each state. Higher education institutions are funded by the Central Government through the University Grants Commission (UGC), one of the statutory bodies, or by the State Governments. India, now proudly boasts of the organisation of education of almost every subject developed in the world. But most of the universities have not adopted the model curriculum prepared by the Curriculum development Centres established by the UGC. A great explosion is taking place in the field of knowledge and science in the world, the universities therefore, should keep changing their curriculum in accordance with it.

### Importance and need of higher education

1. **Achievement of higher knowledge, search of new knowledge and identification of truth:** In higher education, youths are provided higher knowledge.
2. **Preparation of the specialist:** Through higher education, specialists are prepared for different fields of life—religion, philosophy, engineering, medical, education, law, etc.
3. **Development of leadership quality and work efficiency:** Youths are prepared to skilfully perform any work of their interest, which helps them to develop confidence and leadership qualities.
4. **All-round development of the nation:** Two resources are required for the development of any nation. Firstly, its natural resources and secondly, its human

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resources. The higher education is aimed at preparing quality human resources. The economic development depends upon industrialization which in turn depends upon engineers, administrators, scientists, etc. which are prepared through higher education.

**Problems in higher education**

1. After independence, higher education had expanded to a great extent. The government has planned to establish higher studies institution in every state so the problem is not of the quantity but quality.
2. Problem lies with the administration, finance, and control – there are three types of universities: Central, State, and Deemed. Funding policies vary in these universities. Under the political pressure, many universities have been established but problem has arisen, when it comes to its finance, control, and administration.
3. Unrestricted advancement of the higher institution has taken place therefore, not sufficient admissions are taking place.

**3.2.2 State Level**

The establishment of the State Councils of Educational Research and Training (SCERT) has its own history in our country. The National Council of Educational Research and Training was set up in New Delhi in 1961. In 1967, the Andhra Pradesh government established the State Council of Educational Research and Training on its model. In 1973, then the Union Education and Social Welfare Ministry recommended that the State Institutes of Education (SIEs) and other equivalent institutions in all states be converted into the State Councils of Educational Research and Training. As a result, State Councils of Educational Research and Training came to be set up in different states. The National Educational Policy, 1986 attached importance to giving more rights and expanding the working area of the State Councils of Educational Research and Training; it also spoke of giving them autonomy. As a result, their rights and working scope expanded. At present, their main functions are to decide the form, aims, and curriculum of the school education, in accordance with the National Educational Policy and its plan of Action, along with the specific needs of the states. They also develop suitable methods of teaching, techniques for evaluation of educational achievements, and conduct research work in all these fields. Besides, they undertake inspection of schools and formulate and undertake training programmes for pre-service and in-service teachers.

**Aims and Functions of State Councils of Educational Research and Training**

The aims and functions of all State Councils of Educational Research and Training are almost the same. They are:

- To bring about qualitative improvement in school education of all levels
- To conduct academic research, expansion, and training in the field of school education in the state
- To assist/advise the state education department about implementation problems, its policies, and programmes
- To provide academic assistance by reorientation of educational content and experiments, and to give leadership, advice, and suggestions in this fields

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- To organize innovative programmes for expansion and propagation of new trends and approaches related to education
- To organise creative programmes for all-round development of students, such as science fairs, drama, science seminars, youth parliament, writing contests, debate contests, etc.
- To publish educational literature

**Departments of State Councils of Educational Research and Training**

For the realization of the above aims and functions, there are a number of departments in each State Council of Educational Research and Training. Generally, the following departments are found in them.

1. **Primary and Adult Education Department:** Its scope covers primary and adult education. It plans primary and adult education, creates literature for adult education and reviews it.
2. **Language Department:** Its scope is school education. It works for skill development in communication of students, and conducts review and editing of papers and periodicals. It resolves any problems pertaining to the establishment of language laboratories. It also organizes birthdays of great people and thinkers for improvement in language.
3. **Science Department:** Its scope is school education. It organizes training programmes for science teachers and laboratory assistants, science seminars and science fairs for students, and guidance programme for district science specialists.
4. **Textbook Department:** Its scope is school education as well as primary teacher education. It undertakes the duties of constructing curriculum and textbooks for primary classes, reviewing textbooks from classes 1 to 12 and preparing workbooks for them.
5. **Work Experience Department:** It works in the whole field of school education. It determines the area of work experience, discovers methods for its arrangement, and trains in-service teachers in work experience.
6. **Educational Evaluation and Research Department:** Its scope is the entire school education. It trains the teachers in setting test papers and preparing blueprints, holds workshops for them continuous evaluation, conducts educational survey, constructs teacher handbooks, and establishes correlation with school education boards.
7. **Educational Technology Department:** This department organizes computer training programmes for teachers, and evaluates and records lessons of secondary and higher secondary levels under EDUSAT. It undertakes the duties of maintaining computer laboratories and studios, developing low cost teaching aids, and conducting research in educational technology.
8. **In-service Teacher Education and Extension Department:** Its scope is the whole of school education. It is responsible for preparing resource persons for training, organizing training programmes for DIETs and other equivalent institutions, holding conferences and seminars, and conducting action research and research.
9. **Population Education Department:** This department organizes awareness programmes in population education for school heads, administrative people, and

NGOs, prepares teaching-learning material for population education, organizes lectures, and creates awareness for women empowerment, HIV and AIDS, etc., cultivates skill in youth, and review textbooks in the context of population education.

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### **Contribution of State Councils of Educational Research and Training in the field of school education and teacher education**

The State Councils of Educational Research and Training are playing a vital role in all states in the fields of school education, school teacher training, and adult education. We shall discuss in brief the contribution of State Councils of Educational Research and Training in the fields of school education and school teacher training.

#### **Contribution in the field of school education**

The scope of these councils pervades the whole school education from pre-primary to secondary to higher education level. Their contribution in the field of school education are as follows:

- SCERTs are constructing model curriculum for school education.
- They are preparing model textbooks for school classes.
- They are encouraging innovations for children of school level.
- They are constructing teaching aids for schools.
- They are constructing science kits for schools.
- They are preparing software related to school education and are arranging for their broadcast.
- They are developing technique for evaluation of students' achievements at school level.
- They are conducting research work in the field of school education, and are effecting continuous modification in the field of school education.

#### **Contribution in the field of teacher education**

The scope of these councils is the whole of school teacher education from pre-primary to secondary level. We shall discuss in brief their contribution in the field of school teacher education.

- They are constructing model training curriculum for school teachers.
- They are organizing in-service and pre-service teacher training at school level.
- They are organizing refresher courses for teachers.
- They keep control over all DIETs in their respective states, and render technical assistance in execution of their responsibility.
- They guide the DIETs.

#### **3.2.3 District Level**

The National Educational Policy, 1986 announced several programmes for improvement in teacher education, one of which was the setting up of the District Institutes of Education and Training (DIET). Under it, the work of setting up of one such institute in each district was undertaken from 1987. By the year 2011, 555 District Institutes of Education and Training have been set up in the country.

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The District institutes of Education and Training are being set up in the two ways: by raising the level of the existing primary teacher education institutions, and by setting up of new institutes. When it is established anew, the land is made available by the State Governments, and the rest of the expenditure is borne by the Central Government. As per the norms prescribed by the Human Resource Development Ministry, there should be about 10 acre of land for the setting up of a new District Institute of Education and Training. And its infrastructure should include principal office, staff room accommodation for principal and other staff, hostel facility, psychology laboratory, provision for an institute clinic, and a part-time doctor. A library for it should contain about 10,000 books. An established institute should have a principal, a vice principal, 43 lecturers in different departments, and 15 support staff, such as technicians and administrative officers, etc. The newly established District Institutes of Education and Training should have a principal, 7 senior lecturers, and 17 lecturers besides 23 other workers, such as technicians, laboratory assistant, and clerical staff.

### **Aims and Functions of District Institutes of Education and Training**

The aims and functions of the District Institutes of Education and Training can be enumerated as follows:

- To provide pre-service teacher education for qualitative improvement in primary education.
- To provide in-service training for primary school teachers.
- To provide in-service training for guides of informal education and workers in adult education
- To arrange for refresh courses for principles of primary and upper primary schools and to construct innovative micro-level projects.
- To conduct research work in the fields of primary, informal, and adult education
- To run training programmes for community workers and other related people as per their needs.
- To establish evaluation centres for primary and upper primary schools, informal education, and adult education centres.
- To organize extension services as resource centres and learning centres.
- To give educational advice and guidance to educational institutions, district education boards, and school.
- To arrange for decentralization of school administration and educational reforms.
- To construct educational plans at district level.
- To organize training programmes for resource persons working for universalization of primary education.
- To assist the district administration in running of primary, informal, and adult education.

### **Departments of District Institutes of Education and Training**

For the realization of the above aims and functions, different departments are set up in each District Institutes of Education and Training. In different District Institute of Education and Training of the country, there are different departments, units, and cells. We shall



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discuss different departments of these District Institutes of Education and Training in brief:

- 1. Department of Pre-service Teacher Education (PSTE):** This department arranges for pre-service training for primary teachers. These programmes are run by different names in different states, such as BTC, STC, etc.
- 2. In-service programme, Field Interaction, and Innovation Coordination (IFIC):** This department is responsible for running in-service teacher education programmes and refresher courses for innovation. Also, it assists the district education administration in formulating educational project in the district. Its duties include finding solutions to academic problems and effective use of innovative teaching technique.
- 3. District Resource Unit (DRU):** Its scope is adult and informal education. It coordinates adult and informal education programmes in the district and trains its supervisors.
- 4. Planning and Management:** It trains principals of primary schools and block level education officers. Also, it assists in school mapping and micro-planning. Its duties include compilation of academic data and estimation of backward areas from academic viewpoint.
- 5. Department of Curriculum Material Development and Evaluation (CMDE):** It develops primary teacher education curriculum. Also, it organizes workshops on evaluation techniques.
- 6. Department of Work Experience:** It prepares teaching learning material. Also, it assists primary schools, upper primary schools, adult education centres, and informal education centres in work experience activities. It also holds community service programmes.
- 7. Department of Educational Technology:** This department creates low cost teaching aids. It also maintains, computer laboratory and audio-visual aids, and gathers audio-video cassettes and teachers how to use slides in teaching.

### Contribution of District Institutes of Education and Training in the field of primary education and primary teacher education

The responsibility of District Institutes of Education and Training is limited to primary education and primary teacher education. We shall discuss the contribution of District Institutes of Education and Training in the field of primary education:

- These institutes decide and maintain the form of primary education in the districts.
- They are constructing teaching aids relating to primary education.
- They are preparing software relating to primary education.
- They are developing objective methods for evaluation of students' achievements.
- They are trying to understand the problems of primary education and are finding the solutions to them; it is another thing that this work cannot be efficiently done in the absence of adequate human resources.
- They are conducting research work in the field of primary education; this is, however, another thing that this work is being undertaken by only 50 per cent of them.

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The contribution in the field of primary teaching education are:

- These institutes are organizing primary school teacher training
- They are running refresher courses for in-service primary teachers; however, only 50 per cent of the District Institutes of Education and Training are running these.
- They are undertaking research work in the field of primary teacher education; though about 50 per cent of the District Institutes of Education and Training are engaged in this task.
- They are trying to understand the problems of primary teacher education and are trying to find their remedies.
- They are guiding other equivalent institutions in the district, but of course, not all District Institutes of Education and Training are doing it.

### Teacher training institutes

Elementary teachers are trained in Teacher Training Institutes (TTI, they are also known as Junior Basic Training Institutes or Primary Teacher Colleges) attached to state and university departments of education. The course generally lasts for two years and leads to a Diploma in Teacher Education or a Primary Teacher Certificate, P.T.C.

It is requisite for secondary teachers to hold a Bachelor's degree in Education or in a few instances a Bachelor of Teaching. The B.ED or B.T requires one year of fulltime study, which is followed by a Bachelor degree, normally in arts, science, or commerce. Teachers at the upper secondary level usually are required to hold a master's degree in their area of teaching specialization. Four Regional Colleges of Education offer a combined four-year integrated programme leading to a Bachelor's degree.

It is mandatory for Teachers at colleges of education to hold a M.Ed. and a Ph.D degree. Studies for these are undertaken at a number of universities. Instructors in technical and vocational schools are normally trained in Central Training Institutes (CTIs), which offer one-year courses giving training in skills development and principles of teaching. Graduates of these institutions are awarded an Instructor Training Certificate.

The National Council for Teacher Education (NCTE) is entrusted by the central government with all the matters regarding teacher education of India, including the quality check, content, and evaluation. In the modern curriculum those subjects should be emphasised that are related to the needs of the present society. Along with this they should also be helpful in preparing students in vocational aspects.

The old curriculum that was Subject Centred has now been modified into being activity-based and child-centred. The table 3.1 shows the comparison between them.

Table 3.1 Traditional versus Modern Curriculum

S. No	Traditional Curriculum	Progressive Child-Centred Curriculum
1	Focuses on the bookish knowledge	Child is the centre
2	It is Subject-Centred	Activity and Child-Centred
3	It is not so flexible	Flexible
4	Does not pay attention to the individual differences of the students	It does pay attention to the individual differences of the students
5	Not in the interest of the nation	It pays heed to the nation's interest
6	No space for new technology	Gives importance to new technology

Since curriculum education is a developing process therefore, it needs regular updating in reference to the technological advancements and needs. In this direction, the suggestions given are as below:

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1. In curriculum, the research and experiments should be done by experts.
2. The books and other materials of aid should be developed keeping in mind the benefits to the students.
3. Teachers should be well updated with the new development, for that in-service training should be organised.
4. The school and colleges should be given freedom to develop the curriculum as per their requirements.

**Critical evaluation of the existing curriculum**

If we critically evaluate the current curriculum, following points come to notice:

- The present curriculum has a very narrow attitude; it is only meant for getting admission into higher institution.
- It emphasises on bookish knowledge because most of the curriculum is theoretical and classical at all levels of education. It is related to micro and general ideas only.
- Every subject is laden with so many ideas and facts that they put unnecessary pressure on the learning capabilities of the students.
- The approval of the perspectives of the 'experts' in the curriculum has weakened the structure of the curriculum because the experts often try to include their content in the curriculum. They do not keep in mind the interest, needs, psychology, etc of the child.
- The existing curriculum is not based on the concept of individual differences. Among adolescents there are differences of opinion, attitude, aptitude, etc. which does not seem to reflect in the existing curriculum.
- There is lack of establishment of proper technical and vocational courses.
- Too much pressure of tests and exams is there on the students and even on the parents.
- Much of the curriculum part is not related to the actual life, therefore on completing the course, students are not able to adjust to the environment.
- In the present curriculum, there is too much inclusion of different subjects which may not have connection with each other. This results in teachers not able to complete their courses on time and thus, no time is left for the activities.

**Causes of the defects**

In modern times, there has been a lot of development in the cognitive aspect of the education and even the fundamental concepts have undergone restructuring in physical, biological, and social aspects.

Due to the development and emergence of new concepts in the field of education, there has been increased in the demand for extending the time period of the secondary education. Apart from this, there is a need of transforming education in accordance with the needs of nature.

**Check Your Progress**

1. Define NCERT and SCERT.
2. What are the unique features of NOS?
3. Mention any three contributions of SCERT in the field of teacher education.
4. In what ways are the District institutes of Education and Training being set up?
5. Name the levels in which Indian education system is divided.

**3.3 NATIONAL CURRICULUM FRAMEWORK:  
FEATURES****NOTES**

The National Curriculum Framework (NCF 2005) is one of the four National Curriculum Frameworks published in 1975, 1988, 2000, and 2005 by the National Council of Educational Research and Training (NCERT) in India. NCF 2005 has been translated into 22 languages and has influenced the syllabi of 17 States.

The document frequently revolves around the question of curriculum load on children. National Curriculum Framework (NCF) 2005 owes its present shape and form to the onslaught of ideas generated through a succession of rigorous deliberations by distinguished scholars from different disciplines, principals, teachers and parents, representatives of NGOs, NCERT faculty, and several other stakeholders at various levels. It received noteworthy contributions from state Secretaries of Education and Directors of SCERTs, and participants of the regional seminars organized at the RIEs. Experiences shared by principals of private schools and Kendriya Vidyalayas (KVs) and by teachers of rural schools across the country helped in further shaping the ideas. Voices of thousands of people, students, parents, and public at large have through regular mail and electronic media helped in mapping multiple viewpoints.

Since the year 1986, when the national policy on education was approved by the Parliament, efforts to redesign the curriculum have been focused on the construction of a national system of education. The basic concerns of education are to help the children to make sense of life and develop their potential, to define and follow a purpose and be acquainted with the rights of others. What we require to replicate is the shared interdependence of humans, as Tagore has said, 'we achieve our greatest happiness when we realise ourselves through others' Likewise, we need to summarize our commitment to the concept of equality, within the context of cultural and socio-economic diversity from which children enter into the gateway of the school. Individual aspirations in current competitive economy have forced to reduce education to just being an instrument of material success. The insight, which places the individual in exclusively competitive relationships, puts irrational strain on children, and thus distorts values. Education must be able to support values that foster peace, humaneness, and tolerance in a multicultural society. This document seeks to provide a framework within which teachers and schools can choose and plan experiences that they think children should have. In order to realise educational objectives, the curriculum should be conceptualised as a structure that clearly expresses the feeling of the required experiences. For this, it should deal with some basic questions such as:

- (a) What educational purposes should the schools try to achieve through the students?
- (b) What educational experiences can help to achieve these purposes?
- (c) How can these educational experiences be meaningfully planned?
- (d) How do we ensure that these educational purposes are indeed being accomplished?

The review of the National Curriculum Framework, 2000 was initiated specifically to address the problem of curriculum load on children. A committee appointed by the Ministry of Human Resource Development in the early 1990s had analysed this problem thoroughly, tracing its roots to the system's tendency to treat information as knowledge. In its report, 'Learning without burden', the committee pointed out that learning at school

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cannot become a thrilled experience unless we change our outlook that perceives the child as a mere receiver of knowledge and should move further than the convention of using textbooks as the basis for examination. The desire to teach everything is based on the thinking that children lack their own creative instinct and their capacity to construct knowledge out of their experience.

### 3.3.1 Guiding Principles of NCF 2005

It proposes four guiding principles for curriculum development, namely:

- Linking knowledge to the life even outside the school
- Ensuring that learning is shifted away from rote methods to live experiences
- Enriching the curriculum to provide for overall development of children rather than textbook centric,
- Making examinations system more flexible and integrated into classroom life

The document is divided into 5 areas:

- Perspective
- Learning and Knowledge
- Curriculum Areas, School Stages, and Assessment
- School and Classroom Environment
- Systemic Reforms

#### (a) Areas of curricular concern

1. Teaching of Sciences
2. Teaching Mathematics
3. Teaching of Indian Languages
4. Teaching of English
5. Teaching of Social Sciences
6. Learning and Habitat
7. Art, Dance, Theatre, and Music

#### (b) Areas for systemic reform

1. Aims of Education
2. Systemic Reform for Curricular Change
3. Curriculum, syllabus, and Textbooks
4. Teacher education for Curriculum Renewal
5. Examination reforms
6. Early childhood education
7. Work and education
8. Educational technology
9. Heritage crafts
10. Health and physical education

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NCF 2005 recommends significant changes in language, Maths, Natural Science, and Social Sciences with an outlook to reduce stress and making education more pertinent to the present day and future needs of children. In language, it makes a renewed attempt to put into practice the three-language formula giving importance to mother tongue as the medium of instruction. India is a multilingual country and curriculum should encourage multilingual proficiency in every child, including proficiency in English, which will become achievable only if learning builds on sound language pedagogy of the mother tongue. The NCF document draws attention to four other areas, specifically Art, Education, Health and Physical Education, Work and Education, and Education for Peace.

### Examination reforms

The report 'Learning without Burden' notes that public examination at the end of Class X and XII should be reviewed with a view to replace prevailing text-based and quiz type questioning which induced an inordinate level of anxiety and stress. While urban middle class children are stressed from the need to perform extremely well, rural children are not even sure about whether their preparation is adequate enough to succeed. The high failure rates, especially among the rural, economically weaker, and socially deprived children, forces one to critically review the whole system of evaluation and examination.

### Paper setting, examining, and reporting

In order to improve the validity of current examinations, paper setting needs to be re-evaluated. The focus could shift to question setting rather than paper setting. These questions need not be generated by experts only. Through wide canvassing, good questions can be pooled all year round, from teachers, college professors in that discipline, educators from other states, and even students. These questions, after careful vetting by experts, can be categorized, according to level of difficulty, topic area, concept/competency being evaluated, and time estimated to solve. These could be maintained along with a record of usage and testing record, to be drawn on at the time of generating question papers.

### Assessment reforms at secondary level

At Secondary and Higher Secondary Stage (Class IX to XII) assessment may be based more on tests, examinations, and project reports, for the knowledge-based areas of the curriculum, along with self-assessment. Other areas would be accessed via observation and also through self-evaluation.

Reports could be presented along with analysis provided to the student regarding various skills/knowledge areas, percentile, etc. This would assist them in understanding areas of study that they need to focus on and also help them by providing a basis for making further choices.

### Innovation in ideas and practices

Under innovations following sections should be kept in mind.

### Plurality of textbooks

Given the perspective that curricular content must meaningfully incorporate experiences of children and their diverse cultural contexts, including languages, it is important that textbook writing is decentralized keeping in view the capacities that are required as well as the systems that will make this possible. The writing of textbooks requires a range of

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capacities that include academic and research inputs, understanding of children's developmental levels, effective skills of communication and children's developmental levels, effective skills of communication and design, etc. While the SCERT which presently has been given the task of textbook writing can continue to be the nodal organization for this purpose, the actual envisioning of the process, selection, and writing of content must be done in a collaborative manner by teams rather than by individual subject experts.

**Encouraging innovations**

Individual teachers often explore new ways of transacting the curriculum to address the needs of students within their specific classroom context (including constraints that they may be facing with regards to space, large numbers, absence of teaching aids, diversity in students, the compulsions of examinations, and so on). These efforts, often pragmatic but also creative and ingenious, by and large remain invisible to the school and larger teaching community and are usually not valued by teachers themselves. The sharing of teaching experiences and diverse classroom practices can provide opportunities for an academic discourse to develop within schools as teachers interact with and learn from each other. It will also encourage new ideas and facilitate innovation and experimentation.

For start, there is a need to create structured spaces within schools, where teachers are encouraged to share and discuss classroom practices and experiences.

**The use of technology**

The judicious use of technology can increase the reach of educational programmes, facilitate management of the system as well as help address specific learning needs and requirements. For instance, the mass media can be used to support teacher training, facilitate classroom learning and used for advocacy. Possibilities of teaching and learning at varied paces, self-learning, enabling dual modes of study, etc. could all benefit from the use of technology, particularly ICT.

The NCF covers an immense range of crucial parameters of the curriculum. It makes a concise survey of the educational scenario and the efforts made in the past in the restructuring of the curriculum. It contains quite a lot of excellent recommendations of the various dimensions of the curriculum and related issues.

The CBSE curriculum, presently in use covers almost all the features of the proposed NCF. The CBSE takes due care of updating it, revising it, and incorporating changes in the evaluation practices. Of course, there is always scope for improvement.

### 3.4 NATIONAL CURRICULUM FRAMEWORK FOR TEACHER EDUCATION (NCFTE 2009)

The Teacher Education Policy in India has evolved over time and is based on recommendations contained in various reports of committees/commissions on education, the important ones being the Kothari Commission (1966), the Chattopadhyay Committee (1985), the National Policy on Education (NPE 1986/92), Acharya Ramamurthi Committee (1990), Yashpal Committee (1993), and the National Curriculum Framework (NCF, 2005). The Right of Children to Free and Compulsory Education (RTE) Act, 2009, which became operational from 1st April, 2010, has important implications for teacher education in the country.

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**3.4.1 Legal and Institutional Framework**

Within the federal structure of the country, while broad policy and legal framework on teacher education is provided by the Central Government, implementation of various programmes and schemes are undertaken largely by state governments. Within the broad objective of improving the learning achievements of school children, the twin strategy is to (a) prepare teachers for the school system (pre-service training); and (b) improve capacity of existing school teachers (in-service training).

For pre-service training, the National Council of Teacher Education (NCTE), a statutory body of the Central Government, is responsible for planned and coordinated development of teacher education in the country. The NCTE lays down norms and standards for various teacher education courses, minimum qualifications for teacher educators, course, content, duration, and minimum qualification for entry of student-teachers for the various courses. It also grants recognition to institutions (government, government-aided, and self-financing) interested in undertaking such courses and has in-built mechanism to regulate and monitor their standards and quality.

For in-service training, the country has a large network of government-owned teacher training institutions (TTIs), which provide in-service training to the school teachers. The spread of these TTIs is both vertical and horizontal. At the National Level, the National Council of Educational Research and Training (NCERT), along with its six Regional Institutes of Education (REIs), prepares a host of modules for various teacher training courses and also undertakes specific programmes for training of teachers and teacher educators. Institutional support is also provided by the National University on Educational Planning and Administration (NUEPA). Both NCERT and NUEPA are national level autonomous bodies. At the state level, the State Councils of Educational Research and Training (SCERTs), prepares modules for teacher training and conducts specialized courses for teacher educators and school teachers. The Colleges of Teacher Education (CTEs) and Institutes for Advanced Learning in Education (IASEs) provide in-service training to secondary and senior secondary school teachers and teacher educators. At the district level, in-service training is provided by the District Institutes of Education and Training (DIETs). The Block Resource Centres (BRCs) and Cluster Resource Centres (CRCs) form the lowest rung of institutions in the vertical hierarchy for providing in-service training to school teachers. Apart from these, in-service training is also imparted through active role of the civil society, unaided schools, and other establishments.

**3.4.2 Financing of Programmes and Activities**

For pre-service training, the government and government-aided teacher education institutions are financially supported by the respective state governments. Further, under the Centrally Sponsored Scheme on Teacher Education, the Central Government also supports over 650 institutions, including the DIETs, CTEs, and the IASEs.

For in-service training, financial support is largely provided by the Central Government under the Sarva Shiksha Abhiyan (SSA), which is the main vehicle for implementation of the RTE Act. Under the SSA, 20 days in-service training is provided to school teachers, 60 days refresher course for untrained teachers, and 30 days orientation for freshly trained recruits. Central assistance for in-service training is also provided to District Institutes of Education and Training (DIETs), Colleges of Teacher Education (CTEs) and Institutes of Advanced Studies In Education (IASEs) under the

**Check Your Progress**

- Summarize the report, 'Learning without Burden'.
- Name the five areas of the NCF 2005.



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Centrally Sponsored Scheme on Teacher Education. State governments also financially support in-service programmes. Several NGOs, including multi-lateral organizations, support various interventions, including in-service training activities.

### Implications of the Right of Children to Free and Compulsory Education Act, 2009 on Teacher Education

The Right of Children to Free and Compulsory Education Act, 2009 has implications on the present teacher education system and the Centrally Sponsored Scheme on Teacher Education. The Act inter alia provides that:

- The Central Government shall develop and enforce standards for training of teachers;
- Persons possessing minimum qualifications, as prescribed by an academic authority authorized by the Central Government shall be eligible to be employed as teachers;
- Existing teachers not possessing such prescribed qualifications would be required to acquire that qualification within a period of 5 years.
- The government must ensure that the Pupil-Teacher Ratio specified in the Schedule is maintained in each school
- Vacancy of a teacher in a school, established, owned, controlled or substantially financed by the government, shall not exceed 10 per cent of the sanctioned strength.

### 3.4.3 National Curriculum Framework on Teacher Education

The National Council of Teacher Education (NCTE) has prepared the National Curriculum Framework of Teacher Education, which was circulated in March 2009. This framework has been prepared in the background of the NCF, 2005 and the principles laid down in the Right of Children to Free and Compulsory Education Act, 2009 which necessitated an altered framework on teacher education, which would be consistent with the changed philosophy of school curriculum recommended in the NCF, 2005. While articulating the vision of teacher education, the framework has some important dimensions of the new approach to teacher education:

- Reflective practice to be the central aim of teacher education.
- Student-teachers should be provided opportunities for self-learning, reflection, assimilation and articulation of new ideas.
- Developing capacities for self-directed learning and ability to think, be critical and to work in groups.
- Providing opportunities to student-teachers to observe and engage with children, communicate with and relate to children. The framework has highlighted the focus, specific objectives, broad areas of study in terms of theoretical and practical learnings, and curricular transaction and assessment strategies for the various initial teacher education programmes. The draft also outlines the basic issues that should guide formulation of all programmes of these courses. The framework has made several recommendations on the approach and methodology of in-service teacher training programmes and has also outlined a strategy for implementation of the framework. As a natural corollary to the NCFTE, the NCTE has also developed 'model' syllabi for various teacher education courses.

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### 3.4.4 Reforms in Regulatory Framework

The National Council for Teacher Education (NCTE) was constituted under the National Council for Teacher Education Act, 1993 for achieving planning and coordinated development of teacher education in the country and regulation and proper maintenance of norms and standards in the teacher education system. In the recent past, the NCTE has undertaken various steps for systemic improvements in its functioning and in improving the teacher education system:

- Based on the study of demand and supply of teachers and teacher educators of the various states, the NCTE has decided not to receive further applications for several teacher education courses in 13 states. This has led to substantial rationalization in the demand-supply situation across states.
- The regulations for grant of recognition and norms and standards for various teacher education courses were revised and notified on 31st August, 2009. The applications for grant of recognition are now processed strictly in chronological order. The new regulations make the system more transparent, expedient, and time-bound, with reduction in discretionary powers of the regional committees.
- E-Governance system has been introduced by way of providing online facility for furnishing of applications and online payment of fees. MIS has been developed to streamline the process of recognition.
- The National Curriculum Framework for Teacher Education has been developed keeping in view the NCF, 2005.
- Academic support is being provided through preparation of manual for the teacher education institutions and publication and dissemination of thematic papers on teacher education.
- Various quality control mechanisms have been developed, including re-composition of the visiting teams, periodical monitoring of the teacher education institutions, and de-recognition of institutions not conforming to the norms and standards prescribed by the NCTE.

## 3.5 CURRICULUM EVALUATION: NATURE AND STEPS

The term curriculum evaluation has been used in various terms of reference. Some writers have used curriculum evaluation to refer to curriculum product evaluation; others use the term in reference to curriculum programme evaluation. Curriculum products such as textbooks or natural curricula are evaluated prior to large-scale implementation. These evaluations are conducted using pre-specified external criteria, outcome data from field trials, or both. Curriculum programmes refer to the instruction that takes place within specific field contexts.

### 3.5.1 Meaning and Nature of Curriculum Evaluation

Evaluation is defined as the process of accumulating data on a particular programme in order to assess its value or worth. Evaluation is performed with the aim of determining whether a programme should be adopted, rejected, or revised. Evaluation is performed for various purposes. For instance, programmes are evaluated to answer its questions

#### Check Your Progress

8. Which act has important implications for teacher education in our country?
9. What are the strategies required to improve the learning achievements of school children?

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and concerns. The public want to know whether the curriculum implemented has achieved its aims and objectives. In a similar manner, teachers want to know whether what they are doing in the classroom is effective or not, and the developer or planner wants to know how to improve the curriculum product.

- **McNeil (1977)** states that 'curriculum evaluation is an attempt to throw light on two questions: Do planned learning opportunities, programmes, courses and activities as developed and organised actually produce desired results? How can the curriculum offerings best be improved?'
- **Ornstein and Hunkins (1998)** define curriculum evaluation as 'a process or cluster of processes that people perform in order to gather data that will enable them to decide whether to accept, change, or eliminate something- the curriculum in general or an educational textbook in particular'.
- **Worthen and Sanders (1987)** define curriculum evaluation as 'the formal determination of the quality, effectiveness, or value of a programme, product, project, process, objective, or curriculum'.
- **Gay (1985)** argues that the aim of curriculum evaluation is to identify its weaknesses and strengths as well as problems encountered in its implementation; to improve the curriculum development process; to determine the effectiveness of the curriculum; and the returns on finance allocated.
- **Oliva (1988)** defined curriculum evaluation as the process of delineating, obtaining, and providing useful information for judging decision alternatives. The primary decision alternatives to consider based upon the evaluation results are: to maintain the curriculum as is; to modify the curriculum; or to eliminate the curriculum.

In simple terms, evaluation can be understood to be a disciplined inquiry to assess the worth of things, and 'things' include programmes, procedures, or objects. Although similar data collection tools may be used, research and evaluation are two different processes. Research and evaluation can be differentiated on the basis of the following three dimensions:

- Evaluation does not usually have generation of knowledge as its objective. Evaluation is applied and research is basic.
- The process of evaluation results in information that may be used in decision-making or in the formulation of policies. Evaluation provides information that can be immediately used while research may not have the same benefits as evaluation.
- Evaluation is a judgement of worth. Evaluation result in value judgements while research need not and some would say should not.

With respect to curriculum, the process of evaluation involves making value judgments regarding the quality and benefits of the curriculum. Curriculum evaluation is influenced by its audience and requirements. Potential audience may include the following:

- **Policy makers and other stakeholders (administrators, teachers, students, parents, communities)** – to inform future action.
- **Donors** – to attract funding or to report on the utilization of funds.
- **Researchers** – for international comparison and identification of effective practices.

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Evaluation of curricula is basically concerned with the following:

- (i) Impact of the curriculum
  - on individual students, their needs, their level of engagement, and their performance;
  - on society, including the appropriateness of values communicated and attitudes fostered, and the level of public satisfaction;
  - on the economy including labour markets as an indicator of economic development;
- (ii) Process through which the curriculum was developed
- (iii) Content and design of the curriculum compared with:
  - recent social, technological, economic, or scientific changes;
  - recent advances in educational research and educational paradigms;
- (iv) Possible future directions for curriculum change.

### Evaluation as comparing objectives and outcomes

Learning outcomes are broad objectives that explain what the learners are supposed to know or be able to do and may be based upon the following:

- The requirements of the learner
- The requirements of society
- What the learner should be aware of with regards to a specific subject

As learning outcomes are broad objectives, they are stated in common terms. For instance, 'the learner will become well-known with the main forms and conventions of medieval literature' or 'the learner will build up a general understanding of hydrocarbon-bearings' are both logical learning outcomes. However, learning outcomes like these cannot be observed, gauged, or evaluated on their own. Each learning outcome, therefore, must be supported and described by one or more particular objectives.

Objectives are the chief building blocks of good quality curriculum design. They sustain the learning outcome in that each is a small step in arriving at what the learner is presumed to know or be able to do. Objectives have the following traits:

- They define specific outcomes or competencies to be attained in terms of skills, content mastery, attitudes, or values.
- They form the basis upon which to choose or design teaching materials, content, or techniques.
- They offer the basis for deciding or assessing when the coaching purpose has been accomplished.
- They provide a structure within which a learner can put in order his efforts to complete the learning tasks.

Well-written objectives are cautiously worded. They involve qualifiers to limit the circumstances and terms under which the objectives are met.

### Need for evaluating curriculum

Before knowing the technique to evaluate curriculum, we must know why we should evaluate any curriculum at all. The reasons help us understand why we need to evaluate the curriculum:

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- Students may be discontented with the existing curriculum and methods of teaching
- Students are not attaining the desired goals set in the curriculum
- There is an alteration or change in the student market
- The professional anticipations could be changing, which consecutively calls for a amendment in the curriculum.
- Changes can also take place in the time and staff resources

The need to evaluate curriculum crops up because it is essential for both teachers and students to decide the extent to which their existing curricular programme and its working have generated positive and curriculum-wise appropriate outcomes for students. To evaluate curricular effectiveness, we must first recognize and explain the curriculum and its objectives and then verify its contents for correctness, totality, depth, relevance and quality.

**Focus of curriculum evaluation**

Evaluation is a word employed in various ways sometimes with imprecise and overlapping meanings (Lawton [Emeritus Professor at Institute of Education, London], 1973). It is much wider than that measurement. It is basically concerned with determining the value or worth, completeness of a learning process, as well as the efficiency with which it is being done. Curriculum evaluation refers to the procedure of studying the plus point or worth of some aspect, or the whole of a curriculum. Depending on the manner in which the term curriculum is defined, the focal point or objects of curriculum evaluation could comprise the following:

- Curriculum design
- Learning environment
- Instruction process
- Resources
- Materials used in instructional practice

It is also necessary to learn about the capability as well as the provision of the necessary teaching resources for example teaching aids, laboratories, library books, and instruments (Wiles [an experienced educational consultant] & Bondi [a senior curriculum consultant], 1989). Curriculum evaluation is obviously a procedure by which we attempt to measure the value and usefulness of any piece of instructive activity which could be a logical project, or a piece of work under taken by or with students.

**Purpose of curriculum evaluation**

Education trains future generation to take their suitable position in the society. It has become necessary that second-rate educational goals, substances, and methods of teaching are removed and up dated in consonance with the advances in social cultural and scientific field. It is also significant to determine how different educational institutions and situations infer a given or approved curriculum. Therefore, there is a need for curriculum evaluation. Curriculum evaluation checks and reports on the excellence of education. Cronbach [an American educational psychologist] (1963) distinguishes the following three kinds of decisions for which evaluation is used:

1. **Course improvement:** Deciding what instructional material and methods are acceptable and where changes are required.

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2. **Decisions about persons:** Recognizing the needs of the student for the sale of planning of instruction and grouping, and acquainting the student with his/her own deficiencies.
3. **Administrative directives:** Finding out how good the school system is, how superior individual teachers are.

The objective of evaluation must be to answer questions of selection, adoption, support, and value of educational matters and activities. It helps in recognizing the essential improvements to be made in content, training methods, learning experiences, educational facilities, staff-selection, and progress of learning objectives. It also serves the need of the policy makers, administrators, and other members of the society for the information about the learning system.

**Subject content**

Subject content is organized collection of information. The information is more often than not structured into smaller units akin to records having fields and sub-fields. Records are compilation of fields, namely, author field, title field, etc. Fields are compilation of data and sub-fields are data inside a field. For instance, in author field, forename, date of birth, etc. may be sub-field.

Subject content is distinguished by the subject domain that it covers. There are several databases developed in specific subject areas and services are generated employing these specialist databases. For example, 'Chemical Abstracts' is a well-known service based on the information resources in the field of chemistry. The key feature of subject databases is that its range is limited by the subject area it covers. Therefore, intensive work is needed at the data collection and evaluation phase. Some databases include a particular discipline; for example, engineering, art, science, etc. Some databases are more common in nature and/or cover various subject areas and are searchable by each of them.

**Organization and mode of transaction**

Let us now discuss the organization and mode of transaction.

**Organization of curriculum**

The previous section dealt with some of the important curricular concerns and imperatives in the context of educational priorities. While designing a school curriculum for the national system of education, it would be necessary that the guidelines for its formulation and its transaction are drawn keeping in view these concerns.

**National curricular framework**

The national curricular framework for elementary and secondary education is envisaged in the context of the national system of education. The basic features and the main thrusts of the curricular framework are as follows:

- (i) Emphasis on the development of human resources for the realization of the national goals of development.
- (ii) Broad-based general education to all learners at the elementary (primary and upper primary) and secondary stages.
- (iii) A common scheme of studies for elementary and secondary stages.
- (iv) The common core components should comprise the following: the history of India's freedom movement; the constitutional obligations; content essential to nurture

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national identity; India's common cultural heritage; egalitarianism, democracy and secularism; equality of the sexes; protection of the environment; removal of social barriers; observance of the small family norm; and inculcation of the scientific temper.

- (v) Emphasis on defining Minimum Learning Outcomes (MLO) for each area of learning at all stages of education.
- (vi) Provision for flexibility in terms of selection of content/components and learning experiences, which would facilitate the attainment of minimum learning outcomes laid down for each stage of school education.
- (vii) Emphasis on child-centred and activity-based processes rather than the teacher-centred approach during the transaction of curriculum.
- (viii) Recasting of the examination system and introduction of continuous and comprehensive evaluation that incorporates both scholastic and non-scholastic aspects of education spread over the total span of instructional time.
- (ix) Establishment of appropriate machinery, such as a National Testing Service (NTS) for the selection, and the development of norms of comparable competence across the nation.
- (x) Applicability of the curriculum to all learners, irrespective of their modes/channels of learning in order to ensure comparability of attainment and to facilitate horizontal and vertical mobility of the learners.
- (xi) Provision of essential facilities for effective transaction of curriculum in all schools/non-formal learning centres.

**Minimum levels of learning**

In order to bring about a broad commonality in the standards of education throughout the country, emphasis has been laid on the introduction of the norms of minimum levels of learning for each stage of school education indicated in terms of minimum learning outcomes to be attained by all the pupils with respect to each curricular area at each stage of school education. The minimum learning outcomes for each curricular area will have to be specified keeping in view the research findings regarding the mental ability of pupils at different stages of their development and the academic and physical resources that could be made available in the school for effective transaction of the curriculum.

The emphasis on defining the minimum levels of learning highlights the importance of the integrative nature of learning-evaluation. Put differently, learning (development) and evaluation (assessment) have been construed as two inseparable aspects of the same phenomenon. It is futile to evaluate the progress of the learners towards the stated objectives unless it is ensured that conscious efforts have been made to provide adequate and appropriate learning experiences for growth and development. Thus, a major shift from evaluation (passing judgement) to learning (development in terms of desired objectives) has been advocated.

While emphasis has been laid on the introduction of the norms of minimum levels of learning and adoption of a common scheme of studies at different stages of school education, flexibility is envisaged in the selection of content and learning experiences as well as in the selection of strategy for curriculum transaction in order to make learning more relevant to the needs and environmental contexts of the pupils and to allow scope for initiatives and experimentation on the part of the teacher, the school, and the local educational authorities. A high degree of flexibility and local initiatives are envisaged in designing and introducing

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remedial and enrichment programmes and materials not only by the state educational authorities, but also by the individual schools and teachers to cater to the needs of slow and fast learners studying in the same class/grade in a school. However, the scope for flexibility in the methodology and approach to transaction of curriculum is not expected to be used for introducing differential courses or similar measures which would accentuate disparities in standards of education in different parts of the country.

**Common core components**

While the rationale underlying the school curriculum of a country reflects its socio-cultural and political ethos, its faithful transaction reflects the genius of its people. The search for national identity has been on since the resistance to colonization of the country began. This search has not ended yet. As a matter of fact, it is more acutely felt now than ever before. Therefore, it is but natural that there is a strong plea for centring the curricular efforts for promotion of national integration and social fusion and cultivation of values as enshrined in the Constitution. Thus, an important aspect of the common core components is the emphasis on instilling a nationally shared perception and values and creation of an ethos and value system in which a common Indian identity could be strengthened.

The ways and means have to be found out to introduce the common core components at all levels of school education. Some suggestions are offered to initiate action on the subject. After the minimum learning outcomes and related general content are identified for each area of learning and for each grade, further scrutiny may be made to explore the possibility of infusing the specific core component with the theme. Where such natural infusion is not possible, an attempt can be made to select new content for each of the ten components to be added as topics/units to each relevant subject. One can envisage cyclic development of a new course of study pertaining to each of the components. For example, a set of courses on the history of India's struggle for freedom can be developed for grades I to X, independent of other subjects. On the other hand, it is also possible to integrate such content appropriately in the regular subjects included in the present scheme of studies.

An eclectic organization is possible by way of integrating clusters of components such as social science components, science components, or moral value components by designing syllabi according to different grades. At the primary stage, core components could be integrated with language and environmental studies so as to make them a medium to develop appreciation of culture and perception of the individual, social, and national identity through activities, songs, stories, reading material, plays, skits, etc. At the upper primary stage, both infusion and unit approach could be adopted.

At the secondary stage, the elements of civics, economics, and sociology may be identified in an integrated manner. In addition to the common core components, the integrated course could cover the content which would reflect the contribution of India in the field of science, astronomy, metallurgy, medicine, creative arts, etc. in the ancient, medieval, and contemporary periods. The core components could be made more interesting through visuals and biographical notes of scientists and eminent Indians in different fields. However, while introducing the core components, it is necessary to ensure that the depth and coverage of information is kept at the appropriate level and does not increase the total information load beyond the existing level in different subjects. This could be done by reducing the content in some of the existing subject areas and properly blending the core components in the total scheme of studies as far as possible.



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**3.5.2 Tools, Techniques, and Steps of Evaluation**

The method of evaluation used by schools has pretty much been the same, that is, by paper-pencil tests. Since a long time, schools measure the student's progress through written tests. However, written tests are not always suitable for every area of learning. Therefore, there is a need to create a new technique which can assess the student's performance. The school needs to make a conscious selection from available tools and techniques. Some tools and techniques that can be used by school are as follows:

- Observation schedules
- Rating scales
- Interviews
- Oral communications
- Interest inventories
- Anecdotal records

The schools also need to make a conscious effort to de-formalize internal and external examinations. If schools introduce more informal means to evaluate the learner's experience, they will not only reduce the anxiety and fear experienced by the learners but in turn will enhance the process of learning at all stages. Learners' achievements need to be evaluated by applying the principle of relevance and flexibility to curriculum development.

In school education, the primary stage of learning is regarded as a period of transition where the student begins learning through informal play activities with the help of organized and formal methods of teaching. The growth and development of young learners needs to be evaluated through similar informal and relaxed methods. In the initial stages of learning, no rigid and/or formal testing should be introduced. It is better that oral testing is used to assess the student's learning at the primary stage of education. By using oral testing, the development of basic skills can be evaluated in language, numeracy, health, nutrition, and sanitation. It is very essential that the school provide periodic checkups to assess the physical, social, and emotional growth of a child; this assessment also needs to be carefully documented. In a similar manner, psychomotor skills with respect to non-scholastic areas like work experience, education, and physical education should be conducted and documented. Thus, with the assistance of informal and formal observations along with various tools and techniques, sufficient evidence of the student's growth and development needs to be collected to create profiles of the learners. Once the student reaches middle school, written tests need to be given more significance while retaining the tools and techniques used at the primary level.

**Types of curriculum evaluation**

The curriculum can be evaluated in different ways. These ways are thus called the types of curriculum evaluation, which can be discussed under the following headings:

**(a) Curriculum Product Evaluation:** This implies revision of curricular materials made available by the very people who have created this material. This can be done in various ways. P. Tamir (1985), a professor of Science Education at the Hebrew University of Jerusalem, categorized these as follows:

- (a) Part-time school-based curriculum development
- (b) National curriculum study organizations; within the structure of national curriculum development centres

(c) Curriculum development done by the university teams

(d) Curriculum product evaluation is also conducted by local, state, or national textbook selection committees, which also think about other instructional material.

**(b) Evaluation based on external criteria:** Curriculum can be evaluated based on external criteria related to the appropriateness of the material. Tyler (Tyler, Louise L., external criteria related to the appropriateness of the material. Tyler (Tyler, Louise L., professor of Education, Emerita, Los Angeles) and Klein (M. Frances Klein is Eminent professor of Education, Emerita, Los Angeles) and Klein (M. Frances Klein is Eminent Professor at Jacksonville State University, Alabama) (1976) offer an excellent example of curriculum product evaluation employing pre-specified criteria. These criteria had a definite behaviourist orientation.

Their evaluation procedure uses the following characteristics:

- Specification of instructional objectives on which the material is based
- Appropriateness of the materials according to the skills
- Background knowledge, age, ethnicity, and socio-economic background of the intended students
- Adequacy of the teachers' manual for classroom application and for providing an explanation of the content selection, sequence, and presentation

Brophy (Jere Brophy is University Distinguished Professor of Teacher Education at Michigan State University and a Fellow of the International Academy of Education) and Alleman's (Janet Alleman is a professor in Department of Teacher Education at the Michigan State University) (1991), derived more heavily from research on teaching, provided a constructivist framework for the evaluation. The criteria they proposed for evaluation include:

- Goal relevance
- Appropriate level of difficulty
- Feasibility
- Cost effectiveness
- Multiple goals
- Motivational value
- Topic relevance

**(c) Formative and Summative Evaluation:** The term formative suggests that the data collected for evaluation has as been assembled during the development or formation stage in order to conduct revisions on the content. Formative evaluation may include determining:

- Who requires this programme? (At what level should this programme be taught?)
- What is the necessity of this programme? (Are students required to learn a particular skill?)
- How to meet the need? (How to introduce a subject?)

In the field of education, formative evaluation is used to access information to enhance a programme. In this case, experts make their evaluation on the basis of the following:

- Instructional strategies and materials used
- Learning outcomes
- Objectives that it wants to achieve

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For instance, in certain cases a curriculum plans a learning outcome, however, the learning activities do not match. The main function of a curriculum is to help students apply critical thinking, however there are no suitable learning activities to provide opportunities for students to practice critical thinking. Therefore, formative evaluation by experts will only be beneficial if done before the programme starts. After evaluation, a review done by the panel of experts may help in modifying and revising selected strategies.

In formative evaluation, on some occasions, learners may also be included to review the content material to check the usability of the material. For instance, if the required prerequisites are available, the students will be motivated to learn. Formative evaluation also helps to pinpoint problems like spelling errors, errors in sequence of content, inappropriate examples, or illustrations. Feedback that is obtained could be used to revise and enhance instruction. It can also help in deciding whether the programme should be implemented or not.

In summative evaluation, data is collected after the implementation of the curriculum programme. This type of evaluation can take place right after a new course material is introduced that is, at a later stage when the students have gone through the new course material. In summative evaluation, it is essential to state the specific questions that need to be answered in the evaluation and what decisions will be made as a result of the evaluation. The evaluation will also find out if the learners have achieved the objective of the programme and whether the programme has produced the desired results. For example, the use of simulation software for geography class that increases the decision-making skills of learners. With the help of formal assessment and the marks obtained by students in these formal assessments, one can determine the outcome of the programme. Summative evaluation can also determine if the innovation was:

- Cost effective
- Efficient in terms of time taken
- Unexpected outcomes

Student's performance will determine the level at which the students met the specified objectives. In this type of evaluation, data can also include qualitative interviews, direct observations and document analyses.

In order to conduct a curriculum evaluation, the following conditions are essential:

- The process of learning should centre on a particular curriculum programme of contrast two-three programmes simultaneously.
- The evaluation process should take place through a standard method
- The curriculum that is being evaluated needs to be reviewed in detail

Prior to evaluating the curriculum, the data needs to be assembled and decisions need to be made as to how the evaluation will be conducted. There are three stages of evaluation that will be followed while evaluating a curriculum:

- (i) Articulation of programme theory
- (ii) Selecting research design and methodology
- (iii) Other considerations

#### (i) Articulation of programme theory

- Prior to evaluation, the evaluation questions need to be decided and articulated. At this stage, the components used in the evaluation process need to be determined as well.

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- In order to articulate the diverse curriculum programmes, the evaluator needs to focus his techniques on different principles and consider different viewpoints to reach a suitable conclusion.
- Student behaviour and role in class needs to be closely monitored, especially the methods and strategies applied by them in problem-solving.
- A learner's growth and development also needs to be measured. The evaluator also needs to check their proficiency over current and preceding topics.
- An informed judgement can be made by the decision-makers after a comprehensible articulation of the curriculum takes place.

#### (ii) Selecting research design and methodology

There are three methodologies to evaluate curriculum, which are as follows:

- (a) Content analysis
- (b) Comparative study
- (c) Case study

##### (a) Features of content analysis

- The evaluation under content analysis is highly influenced by the personal values of the concerned people who are responsible to conduct the evaluation.
- Curriculum analysis should not be limited to simply defining the content. The content also needs to be compared with other curricula.
- A balance needs to be established between the course content and the set objectives.
- The study material should aim to enhance students' thinking power and promote use of logical reasoning in real life incidents.

##### (b) Features of comparative study

- Decisions regarding the selection of relevant variables are taken to help make a comparative study of two or more curricula.
- This type of analysis will identify the effect of the curriculum
- Making a comparative analysis of two or more curriculum programmes helps to decide whether the curriculum that has been finalized is properly designed and implemented.

##### (c) Features of a case study

The main function of case studies is to interpret and identify the complex factors that influence and affect curriculum implementation.

An effective case study depends on the acquired data, student observation, and by interviewing the people involved in the programme.

##### (iii) Other considerations

- The evaluators should be able to comprehend the curriculum designers' point of view and at the same time the evaluators should be able to independently take decisions to ensure objectivity and fairness.

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- The factor of time should also be taken into consideration while the evaluation process takes place. Evaluators need to ensure that there is a sufficient timeframe for the implementation of the curricula.
- It is of utmost relevance that emphasis is given on meta-analysis and the accumulation of knowledge during the evaluation of the curriculum.

**Outcome of curriculum evaluation**

The ultimate objective of evaluation is to bring about qualitative improvement in education. Therefore, evaluation should be construed as a powerful instrument for improving teaching and learning. Instead of using it mainly as a grading device, it should be used more as an effective feedback mechanism for the benefit of the learners, teachers, and parents so that timely corrective and remedial measures could be taken to ensure that the minimum levels of learning laid down are attained by all learners. Retrieval of such feedback should be of immense use to the concerned agencies for the introduction of concomitant changes in instructional materials and methodology of teaching. Evaluation should also help in improving the organization of external examinations. Finally, in the long run, as suggested by the Education Commission (1964-66), it should help determine and gradually raise standards of attainment at the state and national levels.

While the purpose of evaluation should be diagnostic, that is, to ascertain strength and weaknesses of the learner, it should be predominantly so at the elementary stage of school education. Since a majority of the learners quit school at the end of this stage, the school system must ensure that the learner is fully equipped with knowledge, concepts/ideas, attitudes, and values expected from a good citizen of the country. It, therefore, necessitates that more emphasis is laid on development and assessment of basic skills (competencies) and desired attitudes and values rather than rote memorization of information from books.

**Change and refinement of content**

Content refinement depends on the following main factors:

1. Clean and normalize content to attain the best probable relevancy throughout query time
2. Normalize content – ideally data (particularly structured data) – should be reliable and without duplication
3. Appreciate that intake of content will be affected by the quantity and number of different types of data, as well as the latency of the source systems
4. Optimize document processing – take away all needless document processing components and choose the right workstation for the content type and task at hand
5. Marry content with the suitable document processing – language detection, synonyms, spell checking, lemmatization, taxonomy classification, custom plug-ins, etc.

Finest practices in content development include the following:

- **Planning ahead:** It refers to deciding which content requires to be prepared, by whom and at what excellence level. It requires factoring of staff-driven processes into resources, work, and time approximations.

## NOTES

- **Aiming to increase relevancy:** It implies that people use a search platform to find the information they need, only when they require it. Focus efforts on increasing the relevancy of the results returned.
- **Normalizing content:** Ideally, data (particularly structured data) should be consistent and without duplication.
- **Logically separating multi-lingual and localized content:** this can be done by isolating documents on a per-site or language basis.
- **Striving to normalize acronyms:** This can be done with no trouble by expansion in the search system, that is, IBM - International Business Machines.
- **Automating where possible:** Since information is generated and consumed at incredible rates, its automation should be done as and when possible. One can use automated research tools to save time and decrease error rates.

**Curriculum revision**

The final stage in evaluating a curriculum involves trying to find out whether the course or curriculum was successful by means of a linked process of assessment and evaluation, and then using the feedback thus obtained to improve and refine the course or curriculum by going round the cycle once again.

At this point, it would probably be useful to explain exactly what do we mean by the terms assessment and evaluation. Although we tend to use the two terms synonymously, they have different connotations when used in an educational or training context.

'By assessment, first of all, we mean those activities that are designed to measure learner achievement brought about as a result of an instructional programme of some sort.'

'Evaluation, on the other hand, refers to a series of activities that are designed to measure the effectiveness of the instructional system or a section or component thereof.'

The two processes do have a lot in common. We assess the learning outcomes and we evaluate the success of the curriculum on the basis of how the objectives in the curriculum have been specified and achieved. Indeed, one cogent argument for articulating the desired educational outcomes of a course or curriculum in fairly detailed (preferably behavioural) form whenever possible is that this is generally of considerable assistance both in assessing the students and in evaluating the course or curriculum, since the designer should, as a result of writing the objectives/learning outcomes in this way, have a fairly clear idea of the behaviour that is to be measured. Conversely, the feedback obtained from the results of properly-designed assessment and evaluation procedures often demonstrates a need for change in the objectives or learning outcomes of the course or curriculum, as well as in the methods adopted for trying to achieve these.

A curriculum can be evaluated by the results that it claims to achieve and the teachings that it inculcates in the students. One can look at the following factors while evaluating a curriculum:

- Does the curriculum support students to use their own way of thinking to find answers to real-world problems in a more creative and practical way?
- Does it offer them practical information about the subject being taught?

## NOTES

- Does it help students to take up lateral thinking and form their outlooks about a certain topic or concept?
- Does the curriculum groom their personality?

**Things to be kept in mind when revising the curriculum**

Curriculum revision can be a fulfilling experience provided we keep in mind the faculty involvement, resources, and stakeholder expectations. A curriculum revision can be a rewarding experience. The following things should be kept in mind when revising the curriculum:

1. **Faculty involvement:** The faculty of the programme have valuable information about the programme. For example, they know the type of students in the programme and their learning abilities. Faculty also know the course content and, in many cases, know the weaknesses of the courses. Their input into the process of curriculum revision is very valuable, but many of them may be resistant to change – especially when they feel ‘their course’ is threatened. Leaving faculty out of the curriculum revision process invites resistance to the proposed changes.
2. **Consider why a change is necessary:** There are many reasons why a curriculum may need to be revised. Changes in resources, changes in the material covered, and changes in faculty are just a few of the causes of need to revise a curriculum. However, consideration must be given to changes other than curriculum changes that could fix problems within a programme. In order to do this, it is important to collect data that quantifies the need for change. Courses can be redrafted, interrelated to other course by using this data.
3. **Have a plan:** When the decision has been made to consider curriculum revision, a plan must be formulated and the goals of the revision must be stated. The first step is to decide who is going to oversee the revision. It is also necessary to get a committee to collect information. Designing surveys, distributing them, reviewing the suggested changes in relation to other curriculum, and using the data to commence the revision process are important activities. Once a decision to revise a programme has been made, an agreement as to the goals of the revision must be determined. This could relate to decisions, to reduce the number of hours in the curriculum, include concentrations in the curriculum, eliminate courses, and update the content of the curriculum.
4. **Consider requirements of accreditation agencies and government:** When revising a programme, consideration must be given to the guidelines provided by accrediting agencies. ‘Principles of Accreditation: Foundations for Quality Enhancement’ that the government has prescribed must be kept in mind. This sometimes makes it mandatory for the curriculum revision team to retain broad heads of topics. They may be reduced in content or added on in content but it may be mandatory to include the specified content.
5. **Consider stakeholders:** Stakeholders are an important source of information about the needs of a programme. Students, alumni, faculty, and employers should be allowed to provide their insights into the needs of the programme. For example, the survey results of a particular programme indicated that the alumni and faculty consider a particular course as having too much material about one aspect and not enough material about another important aspect. The result of this weakness was the modification of the course; however, the entire curriculum did not need to be revised.

## NOTES

6. **Consider what other programmes are doing:** It is important to conduct a benchmarking study of peer programmes, competitor programmes, and aspirant programmes. Information collected can be used as a starting point for discussion. This helps ensure that the revision is not done in isolation and has relevance to similar programmes running in the state or country.
7. **Consider the resources available:** When revising the curriculum, it is important to review the availability of the resources for the revised programme. These resources could include faculty, finances, technology resources, etc.
8. **Consider assurance of learning goals:** It is important to address the learning goals for the programme. It is necessary to develop rubric clarifying the need for change. There should be systematic processes to develop, monitor, evaluate, and revise the substance of a course. Learning outcomes and objectives must be clearly spelt out. It is also necessary to imbed assurance of learning goals and measurement within the revised courses.
9. **Consider compromise:** Every member of the faculty will have his or her concept of the ideal programme. Unfortunately, each of these concepts differs. In order for a curriculum revision to succeed, many compromises must be made. All the members would have to arrive at conclusion and ultimately decide on what is best for the course in question and for the students in particular.
10. **Remember it will change:** Change has today become the only constant feature of any endeavour and it would be good for us to remember that in spite of the revision that may have been undertaken, there may still arise a need for change and we need to be prepared for that.

By keeping these warnings in mind, a curriculum revision can be a rewarding and productive endeavour. A new curriculum can meet the needs of a programme. The change in the curriculum can bring added enthusiasm to the faculty, and a new approach can address stakeholders’ needs.

**3.6 SUMMARY**

- India has made progress in terms of increasing the primary education and expanding literacy to approximately three quarters of the population. India’s improved education system is often cited as one of the main contributors to the economic rise of India.
- Much development took place between 1964 and 1985 in the field of education in India. National Education Commission, also known as Kothari Commission (1964-66), was appointed by the government of India to make all-inclusive review of the educational system in order to renovate or modify the existing education.
- The State Councils of Educational Research and Training are playing a vital role in all states in the fields of school education, school teacher training, and adult education.
- The National Educational Policy, 1986 announced several programmes for improvement in teacher education, one of which was the setting up of the District Institutes of Education and Training. Under it, the work of setting up of one such institute in each district was undertaken from 1987.

**Check Your Progress**

10. What do you understand by the term curriculum evaluation?
11. What are learning outcomes based on?
12. Mention any one purpose of curriculum evaluation.
13. What is the main condition to evaluate curriculum?



## NOTES

- Elementary teachers are trained in Teacher Training Institutes attached to state and university departments of education. The course generally lasts for two years and leads to a Diploma in Teacher Education or a Primary Teacher Certificate, P.T.C.
- The National Curriculum Framework (NCF 2005) is one of four National Curriculum Frameworks published in 1975, 1988, 2000 and 2005 by the National Council of Educational Research and Training (NCERT) in India.
- National Curriculum Framework (NCF) 2005 owes its present shape and form to the onslaught of ideas generated through a succession of rigorous deliberations by distinguished scholars from different disciplines, principals, teachers and parents, representatives of NGOs, NCERT faculty, and several other stakeholders at various levels.
- The Teacher Education Policy in India has evolved over time and is based on recommendations contained in various reports of committees/commissions on education.
- The Right of Children to Free and Compulsory Education (RTE) Act, 2009, which became operational from 1st April, 2010, has important implications for teacher education in the country.
- Evaluation is defined as the process of accumulating data on a particular programme in order to assess its value or worth. Evaluation is performed with the aim of determining whether a programme should be adopted, rejected or revised.
- The final stage in evaluating a curriculum involves trying to find out whether the course or curriculum was successful by means of a linked process of assessment and evaluation, and then using the feedback thus obtained to improve and refine the course or curriculum by going round the cycle once again.
- When revising the curriculum, it is important to review the availability of the resources for the revised programme. These resources could include faculty, finances, technology resources, etc.

## 3.7 KEY TERMS

- **Vocational course:** Vocational education/course is education/course that prepares people to work as a technician or in various jobs such as a trade or a craft. Vocational education is sometimes referred to as career and technical education.
- **Kendriya Vidyalayas:** These are a system of central government schools in India that are instituted under the aegis of the Ministry of Human Resource Development (MHRD). It is one of world's largest chains of schools.
- **Learning outcomes:** These are broad objectives that explain what the learners are supposed to know or be able to do.
- **Lemmatization:** It is the process of grouping together the inflected forms of a word so they can be analysed as a single item, identified by the word's lemma, or dictionary form.

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## 3.8 ANSWERS TO 'CHECK YOUR PROGRESS'

1. NCERT or National Council for Educational Research and Training is a national organization that plays a key role in developing policies and programmes and preparing a National Curriculum Framework. Each state has its counterpart called the State Council for Educational Research and Training (SCERT). These are the bodies that essentially propose educational strategies, curricula, pedagogical schemes and evaluation methodologies to the states' departments of education. The SCERTs generally follow guidelines established by the NCERT. But the states have considerable freedom in implementing the education system.
2. The unique features of NOS are that it takes education to the doorsteps of motivated learners and does not impose limitations of time and place. Further, it makes provision for studying at one's pace and convenience. Various types of support services are provided to the clientele including Personal Contact Programmes through a number of accredited institutions which are located across the length and breadth of the country.
3. The contributions of SCERT in the field of teacher's education are:
  - a) They are constructing model training curriculum for school teachers.
  - b) They are organizing in-service and pre-service teacher training at school level.
  - c) They are organizing refresher courses for teachers.
4. The District institutes of Education and Training are being set up in the two ways: by raising the level of the existing primary teacher education institutions, and by setting up of new institutes.
5. India's education system in general is divided into the following levels:
  - a) Pre-primary level
  - b) Primary level
  - c) Elementary education
  - d) Secondary education
  - e) Undergraduate level
  - f) Postgraduate level
6. In the report, 'Learning without Burden', it was pointed out that learning at school cannot become a thrilled experience unless we change our outlook that perceives the child as a mere receiver of knowledge and should move further than the convention of using textbooks as the basis for examination. The desire to teach everything is based on the thinking that children lack their own creative instinct and their capacity to construct knowledge out of their experience.
7. The five areas of the NCF 2005 are:
  - a) Perspective
  - b) Learning and Knowledge
  - c) Curriculum Areas, School Stages, and Assessment
  - d) School and Classroom Environment
  - e) Systemic Reforms

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8. The Right of Children to Free and Compulsory Education (RTE) Act, 2009, which became operational from 1st April, 2010, has important implications for teacher education in our country.
9. The strategies required to improve the learning achievements of school children are (a) prepare teachers for the school system (pre-service training); and (b) improve capacity of existing school teachers (in-service training).
10. The term curriculum evaluation has been used in various terms of reference. Some writers have used curriculum evaluation to refer to curriculum product evaluation; others use the term in reference to curriculum programme evaluation.
11. Learning outcomes are broad objectives that explain what the learners are supposed to know or be able to do and may be based upon the following:
  - a) The requirements of the learner
  - b) The requirements of society
  - c) What the learner should be aware of a specific subject
12. The purpose of curriculum evaluation is course improvement that is, deciding what instructional material and methods are acceptable and where changes are required.
13. The main condition to evaluate curriculum is the focus on the gathering of the data and the decisions that must be made for appropriate evaluation.

### 3.9 QUESTIONS AND EXERCISES

#### Short-Answer Questions

1. List the special features of the National Policy of Education.
2. State any five flaws in the higher education system of India.
3. Trace the development of National Curriculum Framework.
4. Differentiate between formative and summative evaluation.

#### Long-Answer Questions

1. Describe the curriculum of primary, secondary, and higher education in India.
2. Explain the establishment, functions, and importance of SCERT.
3. Discuss the systemic reforms and innovations as given by NCF 2005.
4. Evaluate the role of NCFTE 2009 in the development of teacher education.

### 3.10 FURTHER READING

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# UNIT 4 TEACHING LEARNING PROCESS

## NOTES

### Structure

- 4.0 Introduction
- 4.1 Unit Objectives
- 4.2 Concept of Teaching
- 4.3 Structure of Teaching
- 4.4 Functions of Teaching
- 4.5 Principles of Teaching
- 4.6 Models of Teaching: Elements of Teaching Model
  - 4.6.1 Bruner's Attainment Model
- 4.7 Summary
- 4.8 Key Terms
- 4.9 Answers to 'Check Your Progress'
- 4.10 Questions and Exercises
- 4.11 Further Reading

## 4.0 INTRODUCTION

In the previous units, you have studied about the concept of curriculum, process of curriculum development and significance of curriculum at national, state and local levels and about curriculum evaluation. This unit deals with the entire teaching learning process and about curriculum evaluation. This unit deals with the entire teaching learning process, wherein it includes the concept, structure and functions of teaching. In addition to this, you will also study about the three phases or stages of teaching – pre-active phase, interactive phase and post-active phase. The pre-active phase involves deciding the lesson content, choosing its presentation style and setting learning goals. In the interactive phase, the teacher actually delivers the lesson to the class and in the final post-active phase or the self-reflection phase, the teacher has to go over the lesson plan and evaluate how successfully he/she has delivered it in the classroom. The unit further analyses teaching techniques and strategies which are considered as the key to the teaching-learning process. A number of teaching methods have also been discussed in this unit which are the key to the educational system. The advantages and disadvantages will also be discussed in length which would give a better understanding of these tools.

## 4.1 UNIT OBJECTIVES

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

- Understand the concept, nature and characteristics of teaching
- Discuss various teaching strategies
- Explain the stages or phases of teaching
- Describe the functions and principles of teaching
- Examine the elements of teaching model
- List the different types of teaching techniques
- Understand Bruner's Attainment Model

## 4.2 CONCEPT OF TEACHING

Teaching is an essential part of education. Burton (1963) defines teaching as 'Teaching is the stimulation, guidance, direction and encouragement of learning.' The definition of teaching contains three elements:

- Teaching is a system of action
- Teaching is goal-oriented
- Teaching takes place in a situation where there are controllable and uncontrollable factors.

Instruction and teaching are sometimes used interchangeably. However, instruction is a part of teaching. Instruction is primarily concerned with the development of knowledge and understanding in the pupil about a thing, system or process. Imparting knowledge and understanding merely represent one of the several objectives, which we want to achieve through teaching. Teaching is concerned with all the domains of a pupil's behaviour.

### Nature and characteristics of teaching

Given here are some main characteristics of teaching.

- Giving information:** There are many things that students cannot find out themselves. These things have to be taught by a teacher. Therefore, one essential part of teaching is imparting knowledge.
- Causing to learn:** Knowledge cannot be passed on like money. Sharing knowledge is a two-way process and the student must be receptive to the learning being imparted by the teacher.
- Impacting the way a child responds to his or her environment:** Since the child is born, he or she responds to the environment in different ways at different times. Teaching should help the child to make successful adjustments to his or her environment.
- Stimulation and encouragement:** Teaching should fire the child's enthusiasm and imagination. It must encourage the child to develop his or her natural desires to work and be an active human being.
- Guidance:** A teacher must guide the pupils to learn the right values and use them at the right time in the right manner.
- A skilled occupation:** Every successful teacher is expected to know the general methods of teaching and instruction for creating suitable learning situations. He or she is also expected to be familiar with the general objectives of education.

A few factors differentiate a good teacher from others. A good teacher:

- Recognizes individual differences
- Provides opportunity for activity
- Creates situations that lead to the desired types of learning
- Is kind and sympathetic
- Is not tied to any one method
- Is cooperative

7. Is progressive

8. Is both diagnostic as well as remedial

The trainee-teachers ought to realize that they have not chosen the teaching profession to boast of their knowledge. On the contrary, they are there to bring out the best in the pupil. A good teacher is the one who is able to:

- Motivate the class towards maximum achievement of learning outcomes.
- Ensure that even the weakest child in the class is able to comprehend the lesson.
- Arouse interest and curiosity in the students to know more on the subject.
- Bring out the latent talent in the students.
- Hold onto the attention of the class throughout a period.
- Help the students acquire the skills needed to convert theoretical knowledge into practical real-life applications.
- Encourage independent thinking among the students as well as inspire them to work as a team.

In any lesson delivery, the three most essential ingredients are: *input* (i.e., what the teacher gives), *procedure* (i.e., how the teacher gives) and *output* (i.e., the learning outcome). These ingredients need to be given due importance while planning for teaching. Let us now learn how to draw a plan for teaching a lesson.

Planning for teaching must begin with clear-cut lesson objectives, or what the teacher wants as lesson outcomes. First and foremost, the trainee-teacher should plan the lesson keeping in mind the age group of the target students. Accordingly, the lesson objectives have to be set. In other words, it is the target students' age group that decides the depth of learning to be imparted through the lesson. Remember, the same topic of any subject can be taught for different levels of learning depth. In each case, the lesson objectives will vary. For example, take the case of a topic of English Literature. To teach this topic to the students in the 12-14 age group (middle school level), the trainee teacher has to design a lesson plan with the objectives of building up vocabulary, inculcating reading skills and reading habit, comprehending the prose piece to be taught, understanding the moral of the story, and so on. However, to deliver the same lesson to a higher age group (e.g., secondary level), the teacher is expected to plan it with an entirely different set of objectives, such as critical analysis and appreciation, understanding the author's style of writing, and so on. This age group-based teaching differentiation applies to almost all subjects taught at the secondary school level, particularly in India.

A teacher's professional identity or caliber reflects in deciding the lesson objectives or learning outcomes. However, we come across many experienced teachers who do not attach due importance to the lesson objectives. For them, teaching is just a job, not a profession. Such teachers lack commitment to the students. Neither are they in a position to identify the learning outcomes of their effort nor are they able to connect with their students. Their unprofessional lesson delivery usually translates into the students' poor performance. On the contrary, those teachers who devote a lot of thought to the planning of their lesson objectives never fail to achieve the desired learning outcomes. While planning the lesson objectives for teaching a particular topic to a certain group of students, the teacher should be absolutely clear about what he/she expects the students to know at the end of the lesson. What is of utmost importance is that the teacher should help the student imbibe the skill to think and comprehend independently.

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The learning outcomes or learning objectives can be broadly classified into two categories – general and specific.

- (a) **General Learning Outcomes:** These are long-term outcomes and pertain to the whole topic, not simply to a portion of the topic taught in a given period to a particular class. These do not change throughout the topic.
- (b) **Specific Learning Outcomes:** These are lesson-centric and are related to the day's lesson alone.

For a better understanding of the distinction between the general and specific learning outcomes, we reconsider the example of teaching an English literature topic cited earlier. In this teaching, general objectives would consist of developing reading skills and habits, appreciating literature and building vocabulary. On the other hand, specific objectives of literature teaching would be related to only a portion of the topic to be taught in that period, for example, word-meanings, characters, theme, etc.

### Teacher's Professional Identity

A teacher's professional identity does not emerge completely on the completion of his/her education and training for teaching. It is during his/her working as teacher that he/she emerges as a professional. Teachers' professional identity has two perspectives – cognitive psychological perspective and sociological perspective. These two perspectives are linked in this way: people develop their identity in interaction with other people, which implies sociological perspective, and they express their professional identity in terms of their perceptions about 'who they are' and 'who they want to become' as a result of social interaction (cognitive psychological perspective).

A strong personal commitment towards their profession is a dominating characteristic of teachers. Besides, their emotions also guide the formation of their identities. Successful teaching requires teachers to create an atmosphere that promotes empathic understanding. Teaching involves "human nurturance, connectedness, warmth and love". Each teacher's individual beliefs about his/her role in caring for students form a crucial part of their identity. Besides, political interests and personal values shape teachers' emotions and function as a rationale for their professional actions.

## 4.3 STRUCTURE OF TEACHING

While designing and planning a lesson, it is essential for a trainee teacher to understand that the teaching process consists of three phases or stages: pre-active phase, interactive phase and post-active phase. Let us know about these phases or stages in detail.

### Pre-active Phase

The pre-active phase is meant to plan or prepare for delivering a lesson in the best possible way for effective learning. This stage involves all the preparatory work a teacher has to do before he/she actually delivers a lesson. First of all, the teacher must have access to the approved syllabus for the subject of teaching. In middle-level schools, curricula for different classes are decided internally by the school as per the guidelines of the board/council the school is affiliated to. The respective subject teachers co-ordinate to draw the year planner for teaching their subjects by taking into account various vacations, holidays, etc. A trainee-teacher must go through the year planner for his/her class and subject to ensure that he/she maintains the same pace of syllabus coverage as the fellow teachers.

The next step is to go through the school-prescribed textbooks relating to his/her class and subject. The textbooks along with the year planner serve as a guide to the teacher for making the lesson plan. However, the teacher should use the textbooks simply as an aid for deciding the scope of various lessons of a topic. He/she will have to go much beyond the textbook (for example, consulting reference books, surfing the Internet, etc) while preparing the lesson plan for actual explanation of the topic to the students.

In the pre-active phase planning, it is also important for the teacher to decide what he expects the students to know before the day's lesson starts. In other words, the teacher must know from where to start a particular lesson. It implies that the teacher should have a recapitulation plan ready to ensure that the class is familiar with certain concepts they need to know before moving onto the current topic. Two examples in this context are as follows:

- Before starting the chapter on decimals in arithmetic, a topic taught earlier, that the students have a thorough understanding of fractions, a topic taught earlier. For this, the teacher must incorporate in his/her lesson plan a quick review of the fractions topic through oral or written exercises. Only when he/she is absolutely satisfied about the students' knowledge on fractions, should the teacher start the new topic of decimals.
- In the case of History, to understand King Ashoka's dhamma, one ought to have a clear understanding of the teachings of the Buddha.

**Teaching Strategies or Methods:** The pre-active phase is also the time when the teacher has to decide the teaching methods or strategies to be adopted for delivering lessons to the students. Some notable teaching strategies are: lecture method, demonstrative method, interactive method, project method, heuristic or I discover method, technological or audio-visual method, and activity method. A brief description of these strategies is as follows:

- The *Lecture Method* is a teacher-centric one-sided method where the student participation is minimum. It is mainly used in subjects like social sciences (e.g. history, sociology and political science) where the syllabus is vast and their independent teaching usually begins at the senior secondary school level.
- The *Interactive Method* is very effective at the middle school level where holding onto the attention of the restless age-group for an entire period is a difficult task. Through active participation of the students in the teaching-learning process, the learning becomes an enjoyable experience.
- In the *Heuristic Method* or the *I discover* method, students are given a topic and asked to gather as much information as possible on it from various sources. It is very well suited to subjects like nature study where the student can explore, gather specimens and carry out research on a particular topic. This method can be applied for all age groups of students. The Heuristic Method is gaining a great deal of popularity as now teaching in most subjects at the school level has become application-based with very little scope for learning by rote.
- In the *Demonstrative Method*, the teaching-learning process mainly revolves around various types of teaching aids such audio-visual presentations. These aids may be as basic as the blackboard, maps, charts globe and laboratory apparatus or they may be three-dimensional visuals, PowerPoint presentations. The textbook matter supplemented with teaching aids always enhances the speed of understanding, retention and comprehension.

## NOTES

## NOTES

### Check Your Progress

1. List a few factors that differentiate a good teacher from others.
2. What are the three most essential ingredients of lesson delivery?
3. What are the two perspectives of teacher's professional identity?

## NOTES

- The *Project Method* too has been gaining popularity in this age of application-based learning. It is activity and excursion-oriented and it encourages the students to co-operate and work as a team.

The choice of teaching strategy largely depends on factors such as the subject and topic to be taught, the class to be addressed and the available infrastructure. The last factor is particularly significant for schools in rural or remote parts of India. In these schools, any IT-dependent teaching may not be possible because of absence of computers and the Internet facility. In such cases, the teacher should rule out the possibility of teaching through PowerPoint presentations.

The teacher must appreciate that the teaching methods described above cannot be put into watertight compartments. Many of these methods overlap and can be combined to teach a single topic in one period. For instance, the teacher may begin with a brief introductory lecture on the day's topic. Later on, he/she may use the demonstrative method to explain certain concepts of the topic through charts, maps and specimens. Then, the interactive method may be followed to enable the students to clarify their doubts or to gauge the level of their understanding.

**Interactive Phase**

After preparing the teaching or lesson plan in the pre-active phase, the next step is getting down to actually addressing the class. This step is the interactive phase of teaching in which the teacher actually delivers the lesson to the class. The greater the novelty in introducing a lesson to the class, the more interesting and captivating would be the lesson delivery. Before starting to teach, the teacher must be well aware of the topic-related queries he/she is likely to face from the students, and therefore must be ready with accurate and appropriate answers to them. Although this skill of anticipating student queries and doubts comes with experience yet there are instances of trainee-teachers who, after devoting so much thought and time in preparing their lessons, become masters in this art.

The interactive phase of teaching can best be explained with the help of some concrete subject-based questions as in the following example:

Let us take the example of Mensuration in Mathematics relating to the topic of area and perimeter of plane figures, namely squares and rectangles, to be taught to class VII in an ICSE-affiliated school in a metro in India. Now, in this topic what would be the general objective of the teacher? It should be to ensure that the students understand the use of area and perimeter in day-to-day life. What would be the specific objective? It should be to ensure that the students have understood the concepts and will be able to apply the formulae appropriately.

With these objectives in view, the lesson should then proceed through interactive teaching. Here the teacher should resort to the question-answer method to ensure that all the students are alert and also the concepts are made clear to them.

For instance, the teacher can display various shapes and figures through cutouts and objects to explain plain figures – for example, a circle cutout on a chart paper and a tennis ball. Then it is explained why the former is a plain figure and the latter is not. Similarly, a Rubik cube or a square piece of paper can be used to explain a square figure. Thereafter, the concept of dimensions, namely length, breadth height and depth, is explained. Next, the teacher explains the difference between area and perimeter. Here,

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the teacher can use coloured chalk to draw figures on the board to show the difference and then ask the class some application-based questions as follows:

- If you were to paint the four walls of the classroom what would you need to know – the area or the perimeter?
- If you were to frame a picture, what would you need to consider – the area or the perimeter – to know the required length of wood?

Once these concepts are clear, the teacher will have to explain why area is expressed in square units and perimeter in single units. Next, the teacher is expected to solve some problems on the blackboard with full student participation. This involvement of the whole class in the problem-solving activity will ensure total alertness, attention and co-operation of all the students in the learning process, making learning an enjoyable experience for them.

This can be followed by giving some assignments to the students to assess their learning and ensure that the lesson objectives have been achieved. The next step for the teacher is to consolidate or summarize the day's lesson. At this stage, the main goal is to ensure that the lesson objectives planned at the pre-activity stage are achieved. For this, the teacher will have to emphasize the important elements of the lesson. In this case, the formulae used for measuring area and perimeter of squares and rectangles need to be repeated; their correct applications to be ensured through multiple examples; the units used to express area and perimeter and the reason why area is expressed in square units and perimeter in single unit to be repeated.

**Post-active Phase**

Once the lesson delivery is complete, it is time for the teacher to go into retrospection and introspection about the lesson delivered. This is normally referred to as the post-active phase of teaching or the phase of self-reflection where the teacher has to go over the lesson plan and evaluate how successfully he/she has delivered it to the class. He/she should try to find out whether the learning objectives were met or not, and if not, why not. What changes need to be brought about to eliminate the mistakes committed while teaching. How good or bad were the student responses? Could they have been better? Given another opportunity to teach the same lesson, would the teacher make any effort to amend and improve his/her lesson planning? Would he/she consider using more effective aids? Could he/she answer pupil queries to the full satisfaction of the students? Did he/she become nervous or feel the lack of confidence at any point during lesson delivery? If so, what was the prime reason for it – lack of knowledge on the subject/topic, inability to communicate the idea, lack of time, lack of experience?

No matter what the reason is, the teacher must be in a position to diagnose the problem as fast as possible and take necessary corrective and preventive measures for the future. No matter how experienced or confident a teacher is, mistakes are bound to occur and the scope for self-improvement can never be underestimated. In other words, no lesson is ever a perfect lesson. A conscientious teacher will always think of novel and innovative ways of putting forth a lesson while always keeping in mind the time constraint. In fact, experience shows that this is an area where new teachers very often tend to make mistakes. Either their lesson plans are overambitious with respect to time or they tend to plan a lesson too short, which cannot be stretched for a full period. In that case, the teacher paves the path for unruly behaviour and indiscipline in the class. Hence, always create problems in the class when they are sitting idle and getting bored. Hence,

the teacher should plan the lesson in a manner so as to keep the whole class occupied for the entire period.

In the post-active phase, the teacher also corrects the assignments he/she has set for the class such as class work, homework test, multiple choice type question paper, project work, research work, scrapbook, chart making, map-pointing and experiments. Students' assignments, apart from providing a measure of their comprehension and preparation, also serve as the most effective means to judge the effectiveness of the teacher's lesson delivery. If most of the students have committed the same type of mistakes then it is an indication that somewhere the teacher has failed to reach out to the class, and consequently the related lesson plan needs a review.

To summarize the three phases of teaching, a trainee teacher must realize that the pre-active phase entails the entire lesson preparation by the teacher in terms of procuring the syllabus, going through textbooks and reference books and the internet search, getting ready with the teaching strategies and teaching aids to be used, and planning according to the time available for teaching.

The interactive phase involves actual lesson delivery in the classroom as per the plan developed in the pre-active phase. Here the teacher interacts with the students and actually exposes the subject matter to the class adhering to the lesson scope. It is in this phase that the teacher actually makes use of the various teaching strategies/methods and aids, carries out recapitulation of previous knowledge and summarization of the current lesson while assessing the extent of the student understanding through various oral and written exercises.

In the post-active phase of teaching, the teacher either through the student performance or through self-reflection is able to judge or grade his/her own performance.

#### 4.4 FUNCTIONS OF TEACHING

A creative mind, a problem solver, quick at analysing students' actions/reactions/responses and good at planning effective lessons to cater to the needs of all students—these are some of the qualities desired in someone who wants to make a good teacher. These qualities also give a measure of the role and functions of a teacher.

In group teaching of any level, the main role of a teacher is to **design/plan lessons** for teaching a given syllabus in an organized and student-friendly way. For **systematic lesson delivery**, it is also essential to set clear-cut learning goals or outcomes. As has been made clear in the previous unit, no matter how qualified or professionally experienced an instructor may be, he/she would fail to deliver a good lesson unless he/she properly organizes his/her knowledge and ideas in the lesson keeping in mind the expected learning goals or outcomes. Lesson organization may vary from person to person in respect of style, flexibility or rigidity and specificity. Some instructors may not gain confidence without a lesson plan written out to the minutest detail. On the other hand, for some instructors, it is sufficient to casually jot down on a piece of paper significant points of the lesson to be delivered, and using only that paper they deliver the lesson with remarkable confidence.

In all the three phases of teaching (pre-active, interactive and post-active), the teacher must always remain alert towards the time constraint. The number of hours or periods to finish the syllabus of a subject in an academic year is given. The teaching

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duration cannot be increased. Now, it is up to the teacher to utilize the given time for teaching his/her subject in the best possible way. Hence, the primary function of a responsible and efficient teacher is to plan his/her lessons meticulously so that he/she could make the optimum use of the available teaching time.

Like lesson organization, lesson delivery is also an important aspect of teaching. Here again the teacher's role is important because he/she has to take the right decision on the **methodology** that would be appropriate for achieving the desired learning outcomes. No matter how well organized a lesson plan is in terms of topic explanation and coverage and time management, it may not yield the desired results if the teacher is not prepared to play it by ear. For example, sometimes a very well thought-out teaching strategy may fail with a certain group but may be a hit with another group. It is in such situations that the teacher may be required to come out with new ideas to drive home the lesson to the group which is unable to grasp it. And, this may be required to be done during the lesson delivery itself so as to prevent a period going waste. What actually is the teacher need not tinker with the basic structure of the lesson. What actually is required is modifying the lesson presentation to make it interesting and relevant for the target group. The basic lesson plan acts as a guide for managing the learning environment and is of great use when due to unavoidable circumstances a regular teacher has to be replaced or temporarily substituted.

Just as it is important to plan what and how to teach on a certain day, it is also essential for the instructor to make a detailed **assessment** of the following two outcomes in the post-active phase: (a) attainment of anticipated lesson outcomes by the learner and (b) effectiveness of the lesson in leading the learner towards these outcomes. While assessing the students' performance in the post-active phase, it should be kept in mind that sometimes the students are happy with their learning, but their grades are not as per their expectations. So, the grading system employed to evaluate the students' learning should be objective, reliable and flexible.

In the post-active phase, it is also essential to look into the teacher's role in making an assessment of his/her own performance. This assessment is largely guided by the students' feedback in the form of their classroom achievement, motivation, performance orientation and development of interest in and curiosity about a topic. This assessment, if carried out effectively, can even help predict academic achievement of the students.

The advantages that accrue from **self-assessment** by the teacher are: (a) The teachers can boost their own growth and professional development by addressing the lacunae highlighted in the self-assessment. (b) They can judge the effect of their teaching on each of their students and shift their focus and effort where it counts. (c) They can plan best usage of their time, energy and talent. They can work towards creating an atmosphere in the class for healthy inter-personal relationships that would in due course make co-operative learning possible.

#### 4.5 PRINCIPLES OF TEACHING

Educators and philosophers have emphasized certain principles of teaching, which the teachers are expected to bear in mind for making their teaching effective, efficient and inspirational. Sometimes these principles are classified as psychological and general principles. This classification is however, arbitrary and both types overlap.

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##### Check Your Progress

4. What are the three phases of teaching process?
5. What is heuristic method of teaching?
6. What is interactive phase of teaching?
7. Why is teacher self-assessment advantageous?

## Psychological Principles of Teaching

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- 1. Principle of activity or learning by doing:** Children are active by nature and any process or method that is not based upon student activity is not in accord with the progressive educational theories. So, the first principle is to keep the class active. However, activity does not mean mere physical activity. If a pupil is to develop all sides of his or her personality, then he or she must be active in all ways-social, emotional as well as physical.
- 2. Principle of motivation:** The teacher will do his or her best to motivate all children in the lesson. Motivation arouses the interest of children and once they become interested, they are willing to concentrate and work. Motivation can be developed by: arousing the curiosity of children, utilizing all of their senses, relating body and mind closely together, and linking the subject being taught with real life.
- 3. Principle of self-education:** The best teaching is that which enables the child to learn by his or her own efforts. Children, it is said, must be left free to express themselves. Also, the essential activity in teaching is not the adjustment of the child to the teacher but to adjust to the environment. Teaching must enable the child to work independently and without the teacher at a later stage.
- 4. Principle of individual differences:** No two children are alike. For teaching to be effective, it must cater to individual differences of children.
- 5. Principle of goal setting:** A definite goal must be set before each child according to the standard expected of him or her. Short-term or immediate goals work well for small children and long-term goals for older ones.
- 6. Principle of association:** Thorndike (1932) points out that things we want to go together should be put together. Then it becomes easier to make the students understand their relationship.
- 7. Principle of readiness:** This principle is related to the learner's state of mind regarding readiness to participate in the teaching-learning process.
- 8. Principle of exercise and repetition:** As per this principle, the more a stimulus-induced response is repeated, the longer it will be retained. Other things being equal, exercise strengthens the bond between situation and response.
- 9. Principle of change and rest:** Psychological experiments in learning have demonstrated that fatigue, lack of attention, and monotony can be overcome by making appropriate provisions for change, rest and recreation.
- 10. Principle of feedback and reinforcement:** Learning theories point out that the immediate knowledge of the results and the positive reinforcements in the form of praise, high grade, awards and certificates can contribute to making the task of learning enjoyable.
- 11. Principle of training of senses:** Senses are said to be the gateways of understanding. The power of observation, discrimination, identification, generalization, and application can develop only through the effective training of senses.
- 12. Principle of group dynamics:** Under the influence of the group dynamics, the behaviour of the group members will change to suit the group situation.
- 13. Principle of creativity:** Opportunities should be provided to the students to explore things and events and identify cause-effect relationships.

- 14. Principle of correlation:** Gandhiji firmly believed that correlation should be the basis of all work. He advocated that correlation of the learning task should be established with the craft, physical and social environment.

## General Principles of Teaching

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The general principles of teaching can prove very helpful in obtaining the active involvement and participation of the learners in the teaching learning process. These principles are:

- 1. Proceed from the known to the unknown:** The most natural and simple way of teaching something is to start from what the students already know and proceed to those facts or ideas they are unfamiliar with. This means that a teacher should arouse interest in a lesson by posing questions on the subject matter already known to the pupils. The teacher should proceed step by step to connect the new matter to the old one. For example, a lesson on profit and loss in arithmetic can easily be taught to students by referring to shopkeepers who are looking to make a profit. Similarly, a history lesson on Lord Ram may be taken up with the celebration of Dussehra or Diwali.
- 2. Proceed from simple to complex:** The simple task or topic must be covered first and the complex one can follow later. The words 'simple' and 'complex' are to be seen from the point of view of the child and not that of an adult. For example, in a lesson on nature study, a child will understand the concept of a flower first and its various components later.
- 3. Proceed from the concrete to the abstract:** A child's imagination is greatly aided by some concrete imagery. 'Thing first and words after' is a common saying. To begin with, children cannot think in abstraction. Small children learn from things they can see and touch. For instance, a lesson in geography can be made interesting with the help of models, pictures and illustrations of bridges, rivers, mountains etc.
- 4. Proceed from particular to general:** Before presenting rules and principles, particular examples should be presented. As a matter of fact, the study of particular facts should lead the students to frame general rules.
- 5. Proceed from indefinite to definite:** Children's ideas are usually indefinite, incoherent, and vague. These ideas must be made definite, clear, precise and systematic. For refining ideas, adequate use must be made of actual objects, diagrams and pictures.
- 6. Proceed from empirical to relational:** Observation and experience are the basis of empirical knowledge. Relational knowledge implies a bit of abstraction and argumentative approach. For instance, plane geometry makes better sense when taught in the context of everyday life instead of in the form of highly abstract theory.
- 7. Proceed from psychological to logical:** Logical approach is concerned with the arrangement of the subject matter. The psychological approach looks at the child's interests, needs, mental makeup and reactions. When we treat a subject logically, we are usually thinking of it from our own point of view and not from the point of view of the child. We teach reading by teaching the child to read a whole sentence, not the word or the letter, as in the case of the adult. In a drawing lesson, logically we start with simple lines and curves but psychologically, we must start with drawing a whole animal.



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- 8. **Proceed from near to far:** A child learns well in the surroundings in which he or she resides. So he or she should be first acquainted with his or her immediate environment.

**4.6 MODELS OF TEACHING: ELEMENTS OF TEACHING MODEL**

Teaching techniques are such aids which are used by teachers to develop pupils interest for in the lessons, explaining the contents and remembering it by heart during teaching. From this point of view, in order to achieve the teaching objective, the teacher should not only seek the assistance of a teaching method or teaching technique to educate pupils. In short, teaching techniques are used in order to make the lesson interesting, effective and a success.

Every teacher needs to learn different techniques of teaching. He has to learn, practice and conduct research in every aspect of innovations, which are useful in effective teaching. This section deals with group discussion, team teaching, team learning, seminar, symposium, role play, debate, brainstorming, case method, panel discussion buzz groups, dialogues, field trips, programmed learning, cybernetics, CAI and PSI.

All the techniques are important in the educational field as they are applicable in different situations in the schools and colleges. Here every technique is mentioned with a general concept of common usage. Every technique is discussed here in different dimensions such as concept, process, advantages, limitations and other relevant dimensions.

**Group Discussion**

A group discussion can be defined as an organized conversation in which members of a group actively participate and exchange their ideas with a purpose. Group discussion is a process of joint deliberation; the members are provided with opportunities to appraise their own, if required. A group selects a discussion leader. The procedure of a group discussion is as follows:

- The members of a group choose a leader from among themselves
- The members, including the group leader examine a problem
- Under the leadership of the group leader, the members participate in the discussion
- By the initiation of group leader, the members participate in the discussion
- By coordinating the group leader enables the members to express their views and raise different points of views
- Finally, the group leader concludes the discussion after the group arriving at a conclusion

The success of a discussion depends on the capacity of the discussion leader. Group discussion as a method of teaching and learning depends upon the discussion leader, who is the key person in the whole process. The duties of discussion leader are as follows:

- Plan the discussion
- Initiate the discussion

- Keep the discussion going
- Conclude the discussion

The leader may keep the following points in mind to achieve effective results:

- Have a small group
- Choose a topic of interest
- Have a U-shaped seating arrangement so that members face one another
- Study the problem before hand
- Collect relevant facts
- Keep the discussion to the point
- Create a relaxed atmosphere
- Avoid offending the sentiments of others
- Foster group feelings
- Assure freedom of every member

**Advantages:**

- A successful discussion group leader initiates and inspires the group members and learns together
- Group members get more knowledge from one another
- Group members participate freely in the discussion
- Doubts of the individuals are cleared

**Limitations:**

- The whole group's success depends upon the discussion leader. If the discussion leader do not initiate properly, the group discussion fails
- If the chosen problem is not of group's interest, the members participation will be uninteresting
- If the problem under discussion turns into a heated debate instead of coming to a conclusion

**Team Teaching**

Team teaching involves teachers who work in a team of three to six. A team of four is a successful team in team teaching. The teachers pool their resources which are basically knowledge, skills and experience together and teach a particular subject or topic joining together to teach the same class. They work as a team in the three stages of teaching and learning process i.e. planning, teaching and evaluation. It would contribute to effective learning on the part of the students.

The aim of the whole team should be to integrate into a whole lesson; whatever aspect or aspects they may teach individually as the unity of the whole is not the sum of its parts alone. The time for team teaching is flexible. It may take a day or at least an hour and a half.

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There are three stages in the process of team teaching:

**First stage:** Meet and discuss under which the following is achieved:

- The team meets and discusses the different objectives of teaching particular experiences to be provided to the pupils and evaluation procedures to be adopted.
- Members come to an understanding on the roles to be played by each one of them in teaching the concerned unit to the class.
- The interests and special abilities of each member of the teaching team are taken into account in the assignment of tasks to be undertaken by the different members.

**Second stage:** Teaching

- At the second stage of teaching only one member of the team, teaches the class. The others help that teacher in guiding the students.
- On other occasions, the entire team may take the class, with each member of the teaching team guiding the pupils in one group.
- Each teacher deals with a particular aspect or aspects of the lesson what he or she has undertaken to teach and it also emphasizes on providing a variety of learning experiences.

**Third stage:** Evaluation

In this stage a variety of tools are employed for evaluation of the pupils' achievement and the whole team is involved in it.

**Advantages of team teaching**

- Team teaching helps teachers to pool their resources knowledge, skills etc., and teach the pupils effectively.
- The group other members can rectify the shortcomings of teacher.
- They support one another to deliver their expertise in team teaching.
- Students acquire more inputs at a time.

**Disadvantages of team teaching**

- Unless there is mutual understanding cooperation and coordination among different members of a team, the team teaching strategy would fail to deliver the required matter.
- If the school management does not support team teaching, it cannot succeed.
- Integrating of the expertise is not so easy.
- If one person deviates from the team, team teaching will not work.

**Team Learning**

The class is divided into groups of four or five or in teams depending upon their strengths. In every team, learning together contributes to cooperative effort and earns recognition respect and affection. Particularly in the teaching of languages and social sciences, this type of learning can be tried. Each group should discuss the possible answers. After a particular unit has been taught in the teaching of subjects like mathematics and science,

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the teacher may resort to team learning by asking the class to work in teams and find solution to a given problem. The process of team learning comprises the following:

- **Formation of teams:** The class is divided into four to six teams depending on the strength.
- **Selection of recorder for each team:** Every team selects a recorder to note down the finally agreed answer of the team.
- **New study material along with questions:** Each team is made to study to study the new material the teacher moves from one group to another, helping wherever necessary.
- **Time limit:** A time limit should always be fixed for these team discussions.
- **Learning together:** The student's spark each other's ideas, help each other to learn, exchange points of view and share the responsibility for learning by working together.
- **Recording:** The recorder of every team notes down the finally agreed answers.

**General session:** After the stipulated time is over the entire class should meet in a general session. The teacher calls for the answers to the different questions. Each group gives its answers and the class is helped to arrive at the correct answer in this discussion.

**Advantages:** Advantages of team learning are:

- Team learning is an excellent technique for introducing new material to pupils.
- Students understand how to learn a new topic.
- Students are made to focus their thinking on one major concept at a time.
- They are exposed to the particular information and the teacher is able to hold on to their attention
- Students learn the lesson in an interesting manner.

**Limitations:** Limitations of team learning are:

- In making team, grouping poses a problem to the teacher
- There is a possibility of clever students dominating the team
- Task completion is more time consuming
- Slow learner may not benefit from team learning

**Seminar**

Seminar is a structured group discussion that may follow or precede a formal lecture in the form of a paper presentation. Individuals also prepare papers or reports and present them before a group of peers. The audience critically evaluates the paper and discusses the findings of the paper.

Organization of a seminar is a challenge. The process for organization of a seminar is as follows:

- Announcement of a seminar and call for seminar papers on a particular theme: an association or an institution or academicians announce a particular theme for seminar purpose and call seminar papers for presentation. The participants may submit concise reports of the seminar papers within stipulated time as per the announcement.

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- Receiving the seminar papers and preparing the handouts. The coordinator of the seminar receives the concise reports of the seminar papers and prepares the handouts for the participant's ready reference.
- Organizing the seminar: presentation time should be declared in advance to the paper presenters and a resource person should organize the seminar. After the presentation, the participants react and discuss the issues findings etc., with the presenter.
- Evaluating the seminar papers; based on the issue findings, etc., present the seminar paper evaluated by the observer.

**Advantages:** Advantages of the seminar are:

- Self reliance, self confidence and a sense of cooperation and responsibility are developed.
- As it involves student preparation participation and response from the peer group it breaks the monotony of teaching
- It motivates the students to probe into a topic deeply write it in a report form, present it to fellow students and find satisfactions in their academic effort.
- The seminar is a mode of instructions, stimulation and testing of students' level of comprehension and evaluation.
- Understanding power and questioning ability in a relevant situation is strengthened.
- Ability to detect and derive the principle from the context is developed.
- Seminar is an advanced socialized technique which serves a useful purpose at the collegiate and university level.

**Limitations:** Limitations of seminar are:

- Organization of a seminar is a problem to the organizers.
- The presenters should present only the main points instead of the whole papers as it is.
- If the peer are intentionally critical, the time will pass without any conclusions.
- The observation of the expert is critical to evaluate the presenter.

### Workshop

A workshop is a shop for work where work is done it is not shoptalk but an activity-oriented technique. The educational workshop is a get together for creative educational activity to create or prepare some material. The material may be in a form of a report, syllabi, manuals, critical reviews, visiting places, making teaching learning aids, planning instructional designs, modules, instructional material, special activities etc.

There are three sessions in workshop:

1. **General session:** In this session, first the whole group consisting of students, teachers, administrators etc; together frame guidelines for conducting the workshop.
2. **Small group session:** In this the entire group breaks into smaller groups consisting all types of persons and meets for a few sessions or few days to do work on a specified topic or theme. An expert or resource person in that field guides the group to work properly.
3. **Another general session:** in this session, the members of the group report their deliberations or productions. The others may interact and give suggestions for improvement. Based on the suggestions, inclusions or exclusions take place.

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### Advantages

- The workshop produces some material for further use.
- As everybody involved in work development, it develops work culture.
- It is useful to start any cascade program.
- It is useful to prepare handouts on hard concepts as well as handouts for slow learners.
- Enrichment material, teaching material, training models, teaching models, question banks, question papers are developed in the workshop.
- No stress and strain for the participants.

### Limitations

- We cannot fix equal days for every workshop.
- If suitable worksheets/books/already prepared old materials are not provided, the workshop becomes a failure.
- One workshop cannot produce quality output. To reach the required level, a series of workshops are needed.

In teaching, teaching techniques are such aids which are used to make the lesson interesting to explain the content and to remember it by heart during teaching-learning process. Techniques are not directly linked with the teaching objectives but they are linked with teaching methods, while methods are directly linked with teaching objectives. On the other hand, teaching strategies are a purposefully conceived and determine plan of action. Thus, teaching or instructional strategies refer to a pattern of teaching acts that serve to attain certain outcomes and to guard against others.

Method is wider term which includes techniques and strategies of teaching. Different strategies may be adopted in following a method. Teaching strategies may include different techniques of teaching. Various techniques may be used within the same strategy and method. A teaching strategy assumes that teaching is a science while method assumes that teaching is an art. The term teaching strategy owes its origin to military science where as method is a term of pedagogy. Hence, teaching strategies and techniques are used in order to make the teaching effective, successful and interesting.

#### 4.6.1 Bruner's Attainment Model

Jerome Bruner is one of the forerunners of the Cognitive Revolution in the late 1950's that was set to replace behaviorism. According to Bruner, learning and perception are information processing activities that reflect our needs to simplify and make sense of the environment (Bruner, Goodnow and Austin, 1956, Bruner, 1973). Bruner's ideas about categorization were his most notable contributions. Bruner maintained that people interpret the world in terms of similarities and differences which are detected among objects and events. Objects that are viewed to be similar are placed in the same/common category. The major variable in this theory of learning is the coding system into which the learner organizes these categories.

Based upon the idea of categorization, Bruner's cognitive learning theory states 'to perceive is to categorize, to conceptualize is to categorize, to learn is to form categories, to make decisions is to categorize'.

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There are two stages in the process of categorization. (a) Concept formation which is the preliminary understanding that there are different classes and categories and that there are distinguishing attributes between objects/events. (b) Concept attainment where one can determine those particular attributes and also the way as to how they can be used to identify what belongs to a particular category and what does not.

Bruner holds the belief that all human cognitive activities involve categories. This is the process of building and using representations in order to make sense of the world. The incoming information is either organized in terms of pre-existing categories or new ones are created. Bruner identified three modes of representation, corresponding to the developmental stages that we use to make meaning out of what we encounter in the world. Each of these modes has its unique way of representing objects and events.

Table 4.1 Kinds of Representations Identified by Bruner

Kinds of representation identified by Bruner			
Kinds of Representation	Process	Examples	Use
Enactive	Represented in the muscles (doing)	Tying a knot	Motor skills
Iconic	Using mental images for objects	Having an image of what the knots look like	Sensory skills (mental picture of things)
Symbolic	Using symbol system (thinking, reasoning)	Describing the knot and how to tie it	Intellectual skills (knowing the reality of things)

The first phase is referred to as enactive where a child's world is represented in terms of their immediate sensation and in which learning is achieved through doing. These motor acts that involve certain sequential movements are integrated by a certain conceptual scheme.

The iconic stage involves the use of mental images to represent certain objects or events. The symbolic representation is the highest and most complicated manner in which we acquire learning. It involves the ability to transform actions and images into a symbolic system to encode knowledge. Primarily, these symbols are language and mathematical notation.

**Discovery Learning**

Bruner also advocated the discovery learning approach in schools which he believes would help students in discovering the relationship between different categories/ objects or concepts. This framework promotes learning as a process of constructing new ideas based on current and past/previous knowledge. Students are encouraged to discover the facts and relationships for themselves and continually build on what they already know. The school curriculum is organized in a spiral manner to facilitate this process, such as the same topics are redeveloped at succeeding age or grade levels to progressively reinforce learning. (Bruner, 1966).

Bruner's discovery learning focused on the importance of comprehending the structure of the subjects being studied, the need for active learning as the basis for true understanding, and the importance of inductive reasoning in learning. Students must be

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actively involved in the discovery of major concepts, rather than passively accepting the teacher's explanations. The discovery method enhances students' learning by allowing the class to be involved in the lesson, rather than simply being lectured to.

**Educational Implications**

- The curriculum of a subject should be determined by the most fundamental understanding that can be achieved by the underlying principles that provide structure to that subject. Unless the organization of the curriculum facilitates the formation of structure, it will be learned with difficulty and it will not be remembered for long.
- The best sequence of providing instruction is to present a subject so that the child can first experience it, then react to a concrete presentation and finally represent in symbolic form. For e.g. while teaching the concept of weight, the students can be provided with a balance to understand the concept of heavy or light, then they can be shown a figure of a balance to make them understand and they can be asked to later represent/classify different objects as heavy/light by simply writing 'stone is heavier than cotton'.
- Spiral curriculum approach should be adopted for organizing topics so that they can be developed and redeveloped at different grade levels. This curriculum is ideally suited for discovery learning.

**4.7 SUMMARY**

- Teaching is an essential part of education. Burton (1963) defines teaching as 'Teaching is the stimulation, guidance, direction and encouragement of learning.'
- Some major characteristics of teaching are giving information, causing to learn, helps child to make successful adjustments to his/her environment, simulation and encouragement, and guidance.
- In any lesson delivery, the three most essential ingredients are: input (i.e., what the teacher gives), procedure (i.e., how the teacher gives) and output (i.e., the learning outcome). These ingredients need to be given due importance while doing planning for teaching.
- Planning for teaching must begin with clear-cut lesson objectives, or what the teacher wants as lesson outcomes. First and foremost, the trainee-teacher should plan the lesson keeping in mind the age group of the target students.
- While planning the lesson objectives for teaching a particular topic to a certain group of students, the teacher should be absolutely clear about what he/she expects the students to know at the end of the lesson.
- The learning outcomes or learning objectives can be broadly classified into two categories – general and specific.
- General learning outcomes are long-term outcomes and pertain to the whole topic, not simply to a portion of the topic taught in a given period to a particular class. These do not change throughout the topic.
- Specific learning outcomes are lesson-centric and are related to the day's lesson alone.

**Check Your Progress**

8. Name three general principles of teaching.
9. Define group discussion.
10. What are the advantages of team learning?
11. What do you mean by educational workshop?
12. What does Bruner's cognitive theory state according to the idea of categorization?
13. Mention the two stages of categorization.



## NOTES

- General objectives would consist of developing reading skills and habits, appreciating literature and building vocabulary. On the other hand, specific objectives of literature teaching would be related to only a portion of the topic to be taught in that period, for example, word-meanings, characters, theme, etc.
- A teacher's professional identity does not emerge completely on the completion of his/her education and training for teaching.
- Teachers' professional identity has two perspectives – cognitive psychological perspective and sociological perspective.
- The teaching process consists of three phases or stages: pre-active phase, interactive phase and post-active phase.
- The pre-active phase is meant to plan or prepare for delivering a lesson in the best possible way for effective learning. This stage involves all the preparatory work a teacher has to do before he/she actually delivers a lesson.
- Some notable teaching strategies are: lecture method, demonstrative method, interactive method, project method, heuristic or I discover method, technological or audio-visual method, and activity method.
- After preparing the teaching or lesson plan in the pre-active phase, the next step is getting down to actually addressing the class. This step is the interactive phase of teaching in which the teacher actually delivers the lesson to the class. The greater the novelty in introducing a lesson to the class, the more interesting and captivating would be the lesson delivery.
- Once the lesson delivery is complete, it is time for the teacher to go into retrospection and introspection about the lesson delivered. This is normally referred to as the post-active phase of teaching or the phase of self-reflection where the teacher has to go over the lesson plan and evaluate how successfully he/she has delivered it to the class.
- In the post-active phase, the teacher also corrects the assignments he/she has set for the class such as class work, homework test, multiple choice type question paper, project work, research work, scrapbook, chart making, map-pointing and experiments.
- The interactive phase involves actual lesson delivery in the classroom as per the plan developed in the pre-active phase.
- In the post-active phase of teaching, the teacher either through the student performance or through self-reflection is able to judge or grade his/her own performance.
- In group teaching of any level, the main role of a teacher is to design/plan lessons for teaching a given syllabus in an organized and student-friendly way. For systematic lesson delivery, it is also essential to set clear-cut learning goals or outcomes.
- The advantages that accrue from self-assessment by the teacher are: (a) The teachers can boost their own growth and professional development by addressing the lacunae highlighted in the self-assessment. (b) They can judge the effect of their teaching on each of their students and shift their focus and effort where it counts. (c) They can plan best usage of their time, energy and talent. They can work towards creating an atmosphere in the class for healthy inter-personal relationships that would in due course make co-operative learning possible.

## NOTES

- There are certain principles of teaching, which the teachers are expected to bear in mind for making their teaching effective, efficient and inspirational. Sometimes these principles are classified as psychological and general principles.
- Teaching techniques are used in order to make the lesson interesting, effective and a success.
- A group discussion can be defined as an organized conversation in which members of a group actively participate and exchange their ideas with a purpose. Group discussion is a process of joint deliberation; the members are provided with opportunities to appraise their own, if required. A group selects a discussion leader.
- Team teaching involves teachers who work in a team of three to six. A team of four is a successful team in team teaching. The teachers pool their resources which are basically knowledge, skills and experience together and teach a particular subject or topic joining together to teach the same class.
- Team learning is an excellent technique for introducing new material to pupils.
- Seminar is a structured group discussion that may follow or precede a formal lecture in the form of a paper presentation. Individuals also prepare papers or reports and present them before a group of peers. The audience critically evaluates the paper and discusses the findings of the paper.
- A workshop is a shop for work where work is done it is not shoptalk but an activity-oriented technique. The educational workshop is a get together for creative form of a report, syllabi, manuals, critical reviews, visiting places, making teaching learning aids, planning instructional designs, modules, instructional material, special activities etc.
- Jerome Bruner is one of the forerunners of the Cognitive Revolution in the late 1950's that was set to replace behaviorism. According to Bruner, learning and perception are information processing activities that reflect our needs to simplify and make sense of the environment (Bruner, Goodnow and Austin, 1956, Bruner, 1973).
- Bruner's cognitive learning theory states 'to perceive is to categorize, to conceptualize is to categorize, to learn is to form categories, to make decisions is to categorize'.
- Bruner also advocated the discovery learning approach in schools which he believes would help students in discovering the relationship between different categories/objects or concepts.
- Bruner's discovery learning focused on the importance of comprehending the structure of the subjects being studied, the need for active learning as the basis for true understanding, and the importance of inductive reasoning in learning.

## 4.8 KEY TERMS

- **Teaching Strategies:** It refers to the structure, system, methods, techniques, procedures and processes that a teacher uses during instruction.
- **Interactive Learning:** It refers to a hands-on approach which aims to help students become more engaged and retain more material.

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- **Group Dynamics:** It refers to a system of behaviours and psychological processes occurring within a social group or between social groups.
- **Team Learning:** It refers to the collaborative effort which aims to achieve a common goal within a group.
- **Discovery Learning:** It refers to a technique of inquiry-based learning and is considered a constructive based approach to education.

#### 4.9 ANSWERS TO 'CHECK YOUR PROGRESS'

1. Few factors that differentiate a good teacher from others are:
  - Recognizes individual differences
  - Provides opportunity for activity
  - Creates situations that lead to the desired types of learning
  - Is kind and sympathetic
  - Is not tied to any one method
  - Is cooperative
  - Is progressive
  - Is both diagnostic as well as remedial
2. The three most essential ingredients of lesson delivery are: input (i.e., what the teacher gives), procedure (i.e., how the teacher gives) and output (i.e., the learning outcome).
3. The two perspectives of teacher's professional identity are cognitive psychological perspective and sociological perspective.
4. The three phases or stages of teaching process are: pre-active phase, interactive phase and post active phase.
5. In the Heuristic Method, students are given a topic and asked to gather as much information as possible on it from various sources. It is very well suited to subjects like nature study where the student can explore, gather specimens and carry out research on a particular topic. This method can be applied for all age groups of students. The Heuristic Method, which is also known as the *I discover method*, is gaining a great deal of popularity as now teaching in most subjects at the school level has become application-based with very little scope for learning by rote.
6. Interactive phase is the second phase or stage of teaching which comes after the pre-active phase. In this stage, the teacher actually delivers the lesson to the class. The greater the novelty in introducing a lesson to the class, the more interesting and captivating would be the lesson delivery.
7. The self-assessment by the teacher is advantageous in many ways, such as:
  - (a) The teachers can boost their own growth and professional development by addressing the lacunae highlighted in the self-assessment.
  - (b) They can judge the effect of their teaching on each of their students and shift their focus and effort where it counts.
  - (c) They can plan best usage of their time, energy and talent. They can work towards creating an atmosphere in the class for healthy inter-personal relationships that would in due course make co-operative learning possible.

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8. Three general principles of teaching are:
  - (a) Proceed from simple to complex
  - (b) Proceed from empirical to relational
  - (c) Proceed from psychological to logical
9. A group discussion can be defined as an organized conversation in which members of a group activity participate and exchange their ideas with a purpose.
10. Team learning is an excellent technique wherein teacher introduces new material to pupils, students learn the lesson in an interesting manner. In addition to this, students are exposed to the particular information and the teacher is able to hold on to their attention.
11. The educational workshop is a get together for creative educational activity which aims to create or prepare dome material. The material may be in a form of a report, syllabi, manuals, critical reviews, visiting places, making teaching learning aids, planning instructional designs, modules, instructional material, special activities etc.
12. Based upon the idea of categorization, Bruner's cognitive learning theory states 'to perceive is to categorize, to conceptualize is to categorize, to learn is to form categories, to make decisions is to categorize'.
13. The two stages in the process of categorization are concept formation and concept attainment.

#### 4.10 QUESTIONS AND EXERCISES

##### Short-Answer Questions

1. What are the characteristics of a good teacher?
2. What role does a teacher play in pre-active phase of teaching?
3. What is post-active phase of teaching?
4. Write a short note on functions of teaching.
5. In group discussion teaching, what are the duties of the leader?
6. Briefly mention the advantages and disadvantages of team teaching.
7. Write short notes on:
  - (a) Team Learning
  - (b) Workshop

##### Long-Answer Questions

1. Discuss the three stages of teaching process in detail.
2. What are the different teaching strategies? Explain.
3. Explain the fourteen psychological principles of teaching.
4. Describe the purpose, advantages and limitations of seminar.
5. Discuss the 'discovery learning' approach propounded by Jerome Bruner and its relevance in the present education system.

## NOTES

**4.11 FURTHER READING**

Ornstein, Allan C. and Hunkins, Francis P. 2004. *Curriculum—Foundations, Principles, and Issues*. Boston: Allyn and Bacon.

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Dewey, John. 2010. *The Child and the Curriculum: Including the School and Society*. New York: Cosimo, Inc.

**Website**

<http://www.unesco.org/new/en/education/themes/strengthening-education-systems/quality-framework/technical-notes/different-meaning-of-curriculum/>

**UNIT 5 APPROACHES OF TEACHING**

## NOTES

**Structure**

- 5.0 Introduction
- 5.1 Unit Objectives
- 5.2 Methods of Teaching
  - 5.2.1 Difference between Method and Approaches of Teaching
- 5.3 Approaches of Teaching and Learning
  - 5.3.1 Personalized System of Instruction (PSI)
  - 5.3.2 Computer Assisted Instruction
- 5.4 Summary
- 5.5 Key Terms
- 5.6 Answers to 'Check Your Progress'
- 5.7 Questions and Exercises
- 5.8 Further Reading

**5.0 INTRODUCTION**

Good teaching and good learning are interlinked with each other. Teaching method refers to the general principles and strategies used for classroom instruction. The unit is all about different approaches of teaching. Teaching theories fall into two major parameters: a teacher-centred approach and student-centred approach. The unit goes on discussing the different methods of teaching along with highlighting the difference between teaching methods and teaching strategy. The advantages and disadvantages of computer assisted instruction and its elements have also been discussed in detail in the unit.

**5.1 UNIT OBJECTIVES**

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

- Explain the meaning of methods
- Analyse the different teaching methods
- Differentiate between teaching method and teaching strategy
- Discuss the approaches of teaching and learning
- Understand the learning using computer assisted instruction

**5.2 METHODS OF TEACHING**

According to Vattaine and Spancer, 'Every method has some goodness in it, no method is all good. Children should be told as little as possible and induced to discover as much as possible.'

According to Broudy, 'the method refers to the formal structure of the sequence of facts commonly denoted by instruction. The term method covers both strategies and techniques of teaching and involves the choice of what is to be taught.'

## NOTES

The term 'method' can be defined as a procedure or process for attaining an object. So therefore teaching method can be defined as a process of interpreting the world of knowledge to a pupil's mind. The method refers to the formal structure of the sequence of acts commonly denoted by instruction. The term method covers both strategies and techniques of teaching and involves the choice of what is to be taught.

Now which method should be used to teach, depends upon the abilities and interests of the teacher. But while selecting the method, the teacher should always keep in mind the aims of teaching. These aims include the mental, social and moral development of the child. This development is only possible, when methods of teaching are appropriate and effective. A teacher who does not use suitable method to teach the subject matter according to the requirements of the children, is not supposed to be a good teacher. Generally, children like that method which makes the subject matter clear and easily understandable.

However, it is important to note that a method should not become a means to end concept in itself but should be used as a means to achieve the determined aims and objectives of teaching. The teacher has the liberty to use varied techniques for teaching. At this point other factors like the teacher's abilities, interests and experiences also influence the method of teaching. Hence the method of teaching depends on a number of factors some of which have been mentioned below:

- What to teach?
- Why to teach?
- Whom to teach?
- How to teach, or what are the various methods?
- What are the problems in using these methods?
- How can we remove those problems?
- Which method is the best?

The basic principles of teaching are also kept in mind while selecting a method of teaching. Some important principles of teaching are as follows:

- Principle of learning by doing
- Principle of individual differences
- Principle of motivation
- Principle of correlation
- Principle of linking with previous knowledge of the child
- Principle of distribution
- Principle of repetition
- Principle of certain objectives
- Principle of evaluation

Generally methods of teaching can be classified in two categories:

1. Student-centred methods
2. Teacher-centred methods

## NOTES

**1. Student-centred methods:** As per this classification, the child occupies a central position in the classroom. The whole teaching-learning process is geared to the needs, interest, capabilities and requirements of the child. These are based on psychological principles. The main goal of this method is to develop abilities, skills and discovery attitude among the students. These includes: project, laboratory, problem-solving, heuristic, discussion method etc.

**2. Teacher-centred methods:** In this method, the teacher occupies a central position in the teaching process. According to this method emphasis is given on saying, memorization and recalling information. The children remain passive recipients in this method of teaching and therefore are pushed into the background of the educational process. Teacher-centred method include lecture, historical and lecture cum demonstration methods.

### Various Methods of Teaching

We have already studied these methods in Unit 4, under the pre-active phase. Let us recapitulate these methods in detail here.

**Lecture method:** This is a teacher-centred method. In this method the teacher is an active participant and the child is a passive learner and therefore is not considered a psychological method. In this method, teacher speaks or delivers a lecture on a particular topic and the children listen.

Lecture method is like a one-way traffic, because the teacher gives ideas and the children just receive them. This is the method of imparting information through speech. This is a one man show because the children remain passive throughout the process. Lecture method is more useful at higher level classes. It has also been seen that in this method it is difficult to know the extent to which the student has been able to learn. It is useful in relating some of the historical and mathematical incidents. There are three steps in lecture method:

- Planning by teacher
- Presentation by teacher
- Receiving by the teacher

**Demonstration method:** In science and mathematics, teaching demonstration method is very important. In this method both the teacher and the students are active. The teacher makes a theoretical investigation and proves it in the classroom. The teacher performs the experiment while teaching in the class and pupils acquire knowledge with careful observation of the experiment. This type of teaching is more of a visual aid process where demonstration may be performed by a single teacher or a group of teachers.

The teacher should emphasize on major points in the demonstration and preferably should write them on blackboard. The teacher should be well versed in the handling of the apparatus and equipments. While demonstrating teacher should ask some reflective type of questions to stimulate the power of reasoning and interest of students in the classroom.

**Inductive-deductive method:** Inductive method of teaching and learning is based on induction. Induction means proving a universal truth or theorem by showing that if it is



true in any particular case, it will be true in the next case in the same serial order. This is a method of development in which the child is made or led to discover truth for himself.

In inductive method, the rule and formulas are established after extensive study of experiences, experiments and examples. This method is psychological in nature. The children follow the subject matter with great interest and understanding. The children can understand the whole process in detail.

Deductive method of teaching is the exact opposite of the inductive method. Deductive logics are used in this method. Deductive method is mainly used in algebra, geometry and trigonometry because different relations laws and formulas are used in these sub-branches of mathematics. It is impossible to verify each law and formula practically. In this method help is taken from assumptions, postulates and axioms of mathematics. This method is used for teaching mathematics in higher classes. This is based on deduction.

**Analytic-synthetic method:** The original meaning of the word 'analysis' is to unloose or to separate things that are together. Analysis starts with what we have to find out, and traces the connection between it and the data. With the help of this method, the difficult parts of any problem can be analyzed to find out the solution of the given problem. Thus, separation of different parts of a problem is known as analysis. In this method, we proceed from the unknown to known or from conclusion to hypothesis. In this method, we start from what is to be determined or what is to be proved before reaching a conclusion.

Synthetic method is the reverse of the analytic method. Synthesis means to place together things that are apart or to join separate parts. In this method, we proceed from known to unknown, or we start with hypothesis and end with conclusions. Thus, synthesis begins from the data and connects them with the conclusion. Synthesis is the method of formulation recording and presenting concisely the discovered solution omitting the trials and errors. Synthesis leads to rote memory and doing by mere imitation. Thus, analysis is the process of discovering the solution and synthesis is the method of setting out the solution in a concise form so as to convince yourself and others. Synthesis without analysis is dogmatic. But synthesis is after analysis has a place in the classroom.

**Laboratory method:** To make mathematics more interesting and meaningful, laboratory method is used in teaching of mathematics. In this method, the students get the opportunity to acquaint themselves with the facts through direct experiences individually.

In this method, the student themselves verify the facts and laws of mathematics with the help of experiments. This method needs a laboratory in which equipments and other useful teaching aids related to mathematics are available. For example, equipments related to geometry, mensuration, mathematical model, chart, balance, various figures and shapes made up of wood or hardboard, graph paper, etc.

**Heuristic method:** Like other methods, Heuristic method also has a special place in mathematics teaching. The word 'Heuristic' is believed to originate from Greek word 'Heurisko' which means 'I find out.' The proponent of this method was Professor Henry Edward Armstrong.

This method is more important from educational point of view because in this method the students work is like a researcher and solves the problems. By the use of this method, scientific and mathematical attitude can be developed in the students. Herbert Spencer has thrown light on this method and stated that 'Students should be told minimum and as much as possible they should be encouraged to discover.'

**Project method:** This method was advocated by Kilpatrick, an American educationist. This method is based on pragmatic philosophy. This method chiefly consists of building a comprehensive unit around an activity which may be carried on in the school or outside. It involves a variety of activities. In this method, all the students work together in collaboration.

**Problem solving method:** Every child is curious by nature. He/she wants to find out solutions of many problems which sometimes are puzzling even to adults. Nevertheless, he must be helped to satisfy his curiosity, whenever possible, by solving various problems. We must teach the pupils how to think so that they are able to transfer these techniques to a vast number of varied problematic situations.

Life is full of problems and the successful man in life is he, who is fully equipped with adequate knowledge and reasoning power to tackle these problems. The solution of these problems enables him to have a mastery over his environment. Whenever there is some obstruction in the teaching-learning situation, we say that there is some problem. It is a difficulty that is clearly present and recognized by the learner. It may be a purely mental difficulty or it may be physical and involve the manipulation of data. The children recognize it as a challenge.

**Play Way Method:** The play-way method was conceived by Friedrich Wilhelm August Froebel, who is also the father of the Kindergarten method. The method goes by the principle that all work and learning should be done in the essence of 'play'. Play-way is a means of the subjective and emotional development of the child, that is, development in terms of intellect, skills and feelings. The method is structured on activity-based learning.

### 5.2.1 Difference between Method and Approaches of Teaching

We all are familiar with the term teaching method as we make use of different methods like lecture method, demonstration method, inductive method, deductive method, heuristic method, etc. in our presentation of the subject matter to the students of our class. Any method which we use is always selected and directed to serve our purpose of presenting the subject material as effectively as possible. Any method reflects a particular mode of presentation of some specific contents of curricular subject. Strategy on the contrary is selected and employed not only for the effective presentation of some specific subject material but also for the realization of the pre-determined teaching learning objectives. In this way, strategy as a term is more comprehensive in its scope as well as structure in comparison to a method. The distinctions between the two can be summarized in the Table 5.1.

**Table 5.1** Difference between Teaching Method and Teaching Strategy

Teaching method	Teaching strategy
1. A teaching method stands for the effective presentation of the specific contents of a subject in such a way as may be properly grasped and understood by the students.	1. A teaching strategy stands for the creation of appropriate teaching learning environment leading to help the students in the realization of the set teaching learning objectives.
2. The term method, relatively in old term is related with pedagogy.	2. Term strategy is relatively a new term belonging to military science and educational technology.
3. The nature of the subject matter decides the selection of a method for carrying out teaching task.	3. Nature of the teaching learning objectives is the deciding factor for the selection of a suitable teaching strategy.
4. A teaching method is based on the assumption that teaching is an art.	4. A teaching strategy assumes that teaching is science and quite technical in nature.
5. The effectiveness of the teaching method is evaluated in terms of mastery over the subject matter by using achievement tests.	5. The effectiveness of a teaching strategy is evaluated in terms of the realization of the set objectives by using criterion referenced tests.
6. In a teaching method emphasis is laid over the teaching steps taken for the proper presentation of the subject matter.	6. In teaching strategy emphasis is laid over teaching activities for the proper organization of teaching learning behavior.
7. The steps taken in teaching methods are quite rigid and fixed. Generally, it is quite difficult to bring changes in the style and steps represented by a method.	7. Teaching strategy is quite flexible in its application. It is always subjected to modification in the interest of the best realization of the set objectives in the present circumstances.

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The PSI method is comprised of small self-paced modularized units of instructions where study guides direct learners through the modules. Unit tests are given on each module where the learners must show mastery by scoring at least a 90%. The modules can consist of reading assignments, films, audio tapes, field trips, programmed instruction, conducting an experiment, conducting an interview, and so on.

### 5.3.2 Computer Assisted Instruction

Technology is now-a-days used for learning and teaching in variety of modes. Individualised learning using technology and especially computers is fast catching pace in the education world. Computer assisted learning simply refers to a learner's learning using computer assisted instructions. In simple words, computer assisted learning takes place when a person sits in front of the computer and receives instructions to learn. In most cases, the program or the computer assisted instructions are in an interactive form that makes learning easier and more effective.

Computer assisted instructions make use of a combination of text, images, graphics and sounds to make the learning material easy to understand and use. Computer assisted instruction is like a textbook and has all essential learning and evaluation material but the difference is that it is interactive and available through computers. Computer assisted learning can take place either online or offline and typically includes the following elements:

- Content which is a combination of multimedia and text content that is used by the learner to acquire knowledge.
- Multiple choice questions within the content and at the end of content so that the learners can reflect on what they know.
- Immediate feedback on the learner's progress thereby enabling the learner to perform better.
- Notes on incorrect responses so that the learner knows what he has learned and done wrong.
- A summary of the performance of the learner which enables the learner to reflect on what has been learnt and what has not been learnt.
- Worksheets, tests and exercises for practice so that learners can explore and apply the knowledge they have acquired.

Computer assisted instructions used in computer assisted learning can be of several types:

- **Drill and practice:** Drill and practice type instructions enable the learners to repeatedly practice what they are learning so that they understand the concept in a better manner and learn effectively. Drill and practice instructions also help in the reinforcement of concepts that have already been learned so that a learner gains mastery over the specific concept or subject.
- **Tutorial:** Tutorial is a type of computer assisted instruction which provides the learners with an in-depth knowledge of the concept. Tutorials give complete explanation of a concept and also include games and simulations that help learners learn in a more effective manner and get hands on experience of the concept.
- **Games:** Educational games and software for games provide interactive learning material to the learners who can reinforce their learning by taking

**Check Your Progress**

1. Define 'method' in simple language.
2. Name the two categories of methods of teaching.
3. List any five methods of teaching.
4. What is meant by play way method?

## 5.3 APPROACHES OF TEACHING AND LEARNING

Let us analyse the different approaches of teaching and learning.

### 5.3.1 Personalized System of Instruction (PSI)

The Personalized System of Instruction (PSI) is a method of teaching that helps students take control of and manage their own learning. Students set their own learning objectives, manage their learning, and communicate with others in the process of learning. The method was conceived and perfected by the American psychologists Fred. S. Keller together with J. Gilmour Sherman in the 1960s. The method is also known as the Keller Plan.

## NOTES

part in competitions against other players in the game. The score of the learner tells how well a concept has been learned by a student.

- **Simulation:** Simulation software usually is used to provide hands-on experience to the learners. Using simulations, students can experience in real-world context what they are learning thereby making learning easier and more effective.
- **Discovery:** This type of computer assisted instruction provides the learner with a large number of ideas and allows the student to explore these ideas and find out the best possible solution to the problem at hand. Discovery type instructions enable students to create their own knowledge from a wide range of ideas.
- **Problem solving:** Problem solving computer assisted instructions enable students to solve problems by taking on a scientific thinking and learning approach. Using these types of instruction, learners can analyse and think critically about a concept and therefore learn in a more effective manner.

With computer assisted learning, students become self-learners and learn at their own pace what they want to learn. The following are the advantages of computer assisted learning:

- Computer assisted learning is individualised and so every learner is free to work and learn at his or her pace without influencing or becoming influenced by any other learner.
- Computer assisted learning provides instructions in a structured format and therefore makes it easy for learners to learn facts and figures.
- Computer assisted learning makes the learner more active as the learner is required to actively participate in the interactive instructions to learn in an effective manner. In essence, if the learner is not an active participant, he or she may not be able to learn in the required manner.
- Computer assisted learning provides a reporting mechanism that enables the learner to know of his or her progress. The learners therefore know of their progress and can think and analyse critically what they have learned and how well they have learned the concept.
- Computer assisted learning provides the learners with hand on experience of what is being learned and as a result learners learn the concept better in a wide array of contexts.
- Computer assisted learning enables students to develop reasoning and decision making skills. It also helps the learners develop critical thinking and problem solving skills.
- Computer assisted learning enables the students to apply the concepts they have learned thereby making it easy for the students to develop new knowledge.
- Computer assisted learning gives learning control to the students or the learners and therefore learners can learn what they want in a manner which is the most feasible for them.
- Computer assisted learning is best suited for learners with low aptitudes. Such learners can make use of drilling type instructions to learn a concept in the most effective manner.

## NOTES

Computer assisted learning also has some disadvantages which include:

- The use of computer assisted learning does not enable a learner to develop manual skills. In other words, though students can learn by experiencing what they need to learn, they are unable to learn manual processes like the working of simple machines or experimenting in the science labs.
- Computer assisted learning is an expensive medium of learning as it requires software, machinery and other equipment that may be costly.
- Sometimes the content included in the computer assisted instructions may be out-dated or obsolete as the content is not often updated or modified to meet the dynamic and changing educational needs of the students.
- Computer assisted learning content may not be developed keeping in mind the learning objectives or the learning outcomes expected by the teachers.
- Teachers may lack the motivation as well as the skills to make use of computer assisted learning methods and may even be averse to the same.

## 5.4 SUMMARY

- The term 'method' can be defined as a procedure or process for attaining an object. So therefore teaching method can be defined as a process of interpreting the world of knowledge to a pupil's mind. The method refers to the formal structure of the sequence of acts commonly denoted by instruction. The term method covers both strategies and techniques of teaching and involves the choice of what is to be taught.
- Some important principles of teaching are: principle of learning by doing, principle of individual differences, principle of motivation, principle of correlation, principle of linking with previous knowledge of the child, principle of distribution, principle of repetition, principle of certain objectives, and principle of evaluation.
- Methods of teaching can be classified in two categories: student-centred methods and teacher-centred methods.
- The main goal of student-centred method is to develop abilities, skills and discovery attitude among the students. These includes: project, laboratory, problem-solving, heuristic, discussion method etc.
- In teacher-centred method, the teacher occupies a central position in the teaching process. According to this method emphasis is given on saying, memorization and recalling information. The children remain passive recipients in this method of teaching and therefore are pushed into the background of the educational process. Teacher-centred method include lecture, historical and lecture cum demonstration methods.
- Lecture method is a teacher-centred method wherein the teacher is an active participant and the child is a passive learner and therefore is not considered a psychological method. In this method, teacher speaks or delivers a lecture on a particular topic and the children listen.
- There are three steps in lecture method: planning by teacher, presentation by teacher, and receiving by the teacher.

## Check Your Progress

5. What does PSI mean in education?
6. What do you mean by computer assisted learning?

## NOTES

- In demonstration method, both the teacher and the students are active. The teacher makes a theoretical investigation and proves it in the classroom. The teacher performs the experiment while teaching in the class and the pupil's acquire knowledge with careful observation of the experiment. This type of teaching is more of a visual aid process where demonstration may be performed by a single teacher or a group of teachers.
- Inductive method of teaching and learning is based on induction. Induction means proving a universal truth or theorem by showing that if it is true in any particular case, it will be true in the next case in the same serial order. Deductive method of teaching is the exact opposite of the inductive method. Deductive logics are used in this method. Deductive method is mainly used in algebra, geometry and trigonometry because different relations laws and formulas are used in these sub-branches of mathematics.
- In analytic-synthetic method, we proceed from the unknown to known or from conclusion to hypothesis. In this method, we start from what is to be determined or what is to be proved before reaching a conclusion.
- Synthesis is the method of formulation recording and presenting concisely the discovered solution omitting the trials and errors. Synthesis leads to rote memory and doing by mere imitation. Thus, analysis is the process of discovering the solution and synthesis is the method of setting out the solution in a concise form so as to convince yourself and others.
- Laboratory method is used in teaching of mathematics. In this method, the students get the opportunity to acquaint themselves with the facts through direct experiences individually.
- Heuristic method also has a special place in mathematics teaching. The word 'Heuristic' is believed to originate from Greek word 'Heurisko' which means 'I find out.' The proponent of this method was Professor Henry Edward Armstrong.
- Project method was advocated by Kilpatrick, an American educationist. The method is based on pragmatic philosophy and it chiefly consists of building a comprehensive unit around an activity which may be carried on in the school or outside. It involves a variety of activities. In this method, all the students work together in collaboration.
- The play-way method was conceived by Friedrich Wilhelm August Froebel, who is also the father of the Kindergarten method. The method goes by the principle that all work and learning should be done in the essence of 'play'.
- The Personalized System of Instruction (PSI) is a method of teaching that helps students take control of and manage their own learning. Students set their own learning objectives, manage their learning, and communicate with others in the process of learning. The method was conceived and perfected by the American psychologists Fred. S. Keller together with J. Gilmour Sherman in the 1960s.
- Computer assisted learning simply refers to a learner's learning using computer assisted instructions. In simple words, computer assisted learning takes place when a person sits in front of the computer and receives instructions to learn. In most cases, the program or the computer assisted instructions are in an interactive form that makes learning easier and more effective.
- Computer assisted instructions make use of a combination of text, images, graphics and sounds to make the learning material easy to understand and use.

## NOTES

- Drill and practice type instructions enable the learners to repeatedly practice what they are learning so that they understand the concept in a better manner and learn effectively.
- Tutorial is a type of computer assisted instruction which provides the learners with an in-depth knowledge of the concept.
- Educational games and software for games provide interactive learning material to the learners who can reinforce their learning by taking part in competitions against other players in the game.
- Simulation software usually is used to provide hands-on experience to the learners. Using simulations, students can experience in real-world context what they are learning thereby making learning easier and more effective.
- Problem solving computer assisted instructions enable students to solve problems by taking on a scientific thinking and learning approach.

## 5.5 KEY TERMS

- **Student-centred learning:** It refers to the methods of teaching that shift the focus of instruction from the teacher to the student.
- **Computer Assisted Learning:** It refers to a medium of learning where a learner learns using computer assisted instructions.
- **Play-way method:** It refers to a teaching method which is structured on activity-based learning. It encourages creative skills and self-expression.
- **Personalised System of Instruction (PSI):** It refers to a system that helps learners take control of and manage their own learning. Students set their own learning goals, manage their learning, and communicate with others in the process of learning.

## 5.6 ANSWERS TO 'CHECK YOUR PROGRESS'

1. The term 'method' can be defined as a procedure or process for attaining an object. So therefore teaching method can be defined as a process of interpreting the world of knowledge to a pupil's mind. The method refers to the formal structure of the sequence of acts commonly denoted by instruction. The term method covers both strategies and techniques of teaching and involves the choice of what is to be taught.
2. The methods of teaching can be classified in two categories:
  - (a) Student-centred methods
  - (b) Teacher-centred methods
3. Five methods of teaching are: lecture method, project method, analytic-synthetic method, heuristic method, demonstration method.
4. The play-way method was conceived by Friedrich Wilhelm August Froebel, who is also the father of the Kindergarten method. The method goes by the principle that all work and learning should be done in the essence of 'play'. Play-way is a means of the subjective and emotional development in terms of intellect, skills and feelings. This method is structured on activity-based learning.



5. PSI or Personalised System of Instruction is a method of teaching that helps students take control of and manage their own learning. Students set their own learning objectives, manage their learning and communicate with others in the process of learning. The method was conceived and perfected by the American psychologists Fred. S. Keller together with J. Gilmour Sherman in 1960s.
6. Computer assisted learning simply refers to a learner's learning using computer assisted instructions. In simple words, computer assisted learning takes place when a person sits in front of the computer and receives instructions to learn. In most cases, the program or the computer assisted instructions are in an interactive form that makes learning easier and more effective.

## 5.7 QUESTIONS AND EXERCISES

### Short-Answer Questions

1. Define the student-centred method of teaching. What is the main objective of this method?
2. Write a brief note on lecture method of teaching.
3. What is the difference between inductive and deductive method?
4. Briefly describe heuristic method of teaching mathematics and explain its merits and demerits.
5. List the elements of computer assisted instruction.

### Long-Answer Questions

1. Explain the various methods of teaching in detail.
2. Discuss the significance of drill and oral work in science.
3. Differentiate between teaching method and teaching strategy.
4. Analyse the advantages and disadvantages of computer assisted learning.

## 5.8 FURTHER READING

- Ornstein, Allan C. and Hunkins, Francis P. 2004. *Curriculum—Foundations, Principles, and Issues*. Boston: Allyn and Bacon.
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- Bhatt, B. D. and Sharma, Sita Ram. 1992. *Principles of Curriculum Construction*. New Delhi: Kanishka Publishing House.
- Chauhan, S. S. 2009. *Innovations in Teaching Learning Process, 1E*. New Delhi: Vikas Publishing House Pvt. Ltd.
- Dewey, John. 2010. *The Child and the Curriculum: Including the School and Society*. New York: Cosimo, Inc.

### Website

<http://www.unesco.org/new/en/education/themes/strengthening-education-systems/quality-framework/technical-notes/different-meaning-of-curriculum/>

## UNIT 6 TEACHING AIDS

### Structure

- 6.0 Introduction
- 6.1 Unit Objectives
- 6.2 Meaning and Significance of Teaching Aids
  - 6.2.1 Edgar Dale's Cone of Experience
  - 6.2.2 Procedural Precautions in the Use of Teaching Aids
- 6.3 Types of Teaching Aids
- 6.4 Characteristics of Good Teaching Aids
- 6.5 Improvised Teaching Aids
  - 6.5.1 Value of Improvisation
- 6.6 Summary
- 6.7 Key Terms
- 6.8 Answers to 'Check Your Progress'
- 6.9 Questions and Exercises
- 6.10 Further Reading

## 6.0 INTRODUCTION

The processes of teaching and learning, applied across subjects of the school curriculum, enable the realization of the stipulated teaching-learning objectives by following a well thought out programme. In the case of teaching, a teacher, while adopting a definite curriculum and teaching methodology, strives hard to achieve the desired aims and objectives of teaching. They are also eager to know the results of their efforts, either to enable themselves to provide the necessary magnitude and direction to the ongoing teaching-learning process or to identify what further learning he/she needs to undertake which would be relevant to the set of teaching-learning objectives and the individual achievements of his/her students in terms of their expected behavioural changes. In this process, he/she will use data obtained through the means of tests, measurements, and evaluations or in other words, teaching aids, which are explained in this unit.

## 6.1 UNIT OBJECTIVES

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

- Discuss the meaning and types of teaching aids
- Describe Edgar Dale's Cone of Experience
- Explain the characteristics of good teaching aids
- Understand improvised teaching aids

## 6.2 MEANING AND SIGNIFICANCE OF TEACHING AIDS

According to E.C. Daint, audio visual aids encompass all the material that helps to understand the written or oral subject matter in the classroom or in other teaching situations.

According to Burton, audio visual aids are those sensory objects or images which initiate or stimulate, and reinforce learning.

## NOTES

According to Edgar Dale, audio visual aids are those devices which are used for the communication of ideas between persons and groups in various teaching and learning situations. These are termed as multisensory materials.

Good's *Dictionary of Education* defines audio visual aids as anything by means of which the learning process may be encouraged or carried out through the sense of hearing or the sense of sight.

### Importance of audio-visual aids

Audio-visual teaching aids can be used most effectively during the teaching process, when compared to all other fields. Some of the applications of these teaching aids are as follows:

1. The pictures and photographs pertaining to a particular historical age can be used for the effective presentation of historical material. These can be obtained from museums.
2. Audio-visual aids can be used for presenting and describing large machinery, industries, etc.
3. A brief summary of the observations gained during excursions, etc. can be presented on a bulletin board.
4. It is essential to use teaching aids while imparting knowledge about extremely minute materials.
5. These materials can also be used to provide knowledge about distant places which are not usually or easily visited.
6. These teaching aids can also be used for amplifying sound, for example, using a radio amplifier for listening to heart beat.
7. These aids may be used to provide information about nocturnal animals or those which are generally not seen.
8. They can be used to impart knowledge about materials which are momentary in nature, or which change their form very quickly.
9. These can also be used for carrying out a comparative study of different materials.
10. The audio-visual aids can also be used effectively for studying materials and processes which change very slowly.
11. These aids can be used to illustrate the internal structure of those objects which cannot be seen openly.

### Uses of teaching aids in class

Merely collecting or assembling teaching aids is not a measure of success of the teaching process. It is also essential that these aids are used effectively. To achieve this, a teacher ought to know when and how to use them. If a teacher uses the teaching aids in the manner described below, then it is likely that the outcomes will be suitable, adequate, and effective.

1. **Use in stages:** Teaching aids should be used in three stages, i.e., during the introduction, the presentation, and during revision. The objectives of each of these three stages are different and teaching aids need to be used accordingly.
2. **Use as per need:** Teaching aids should be used as and when necessary. If they are used when not needed, the students can get confused. This may also lead to indiscipline in the class.

## NOTES

3. **Giving time for thinking and observation:** Teaching aids should not be used only for presentation or demonstration; the students should be given sufficient time for contemplation, observation, and learning. Any queries from students should be adequately addressed.

4. **Variation in teaching aids:** If the same type of teaching aids are used repeatedly, the students may get bored with them. Hence, there must be variety created by adopting different teaching aids from time to time.

5. **Removal of teaching aids after use:** After demonstration and application of the teaching aids, they should be removed and stored appropriately. Also, demonstrating more than one teaching aid at a time may cause confusion in the students' minds.

### 6.2.1 Edgar Dale's Cone of Experience

Edgar Dale has presented the relative significance of teaching aids in his book *Audio-Visual Methods in Teaching*, in the form of a cone of experience, as illustrated in Figure 6.1.

The cone of experiences encourages direct and purposeful experiences which makes learning meaningful. Intensive direct experiences enable permanent learning.

It is clear from this diagram that verbal symbols are at the lowest level of learning experiences, whereas direct purposeful experiences are considered to be the best. The other mediums are ordered in between these two extremes.

Thus, in order to derive optimum advantage from the application of teaching aids, a teacher should know the place and importance of each of these aids in the teaching-learning process as well as their utility and methods of evaluation.

Teaching aids can serve as an useful assistant to a teacher. However, these should not overtake or command them under any circumstances. In fact, a teacher should be directing their operation during the teaching process.

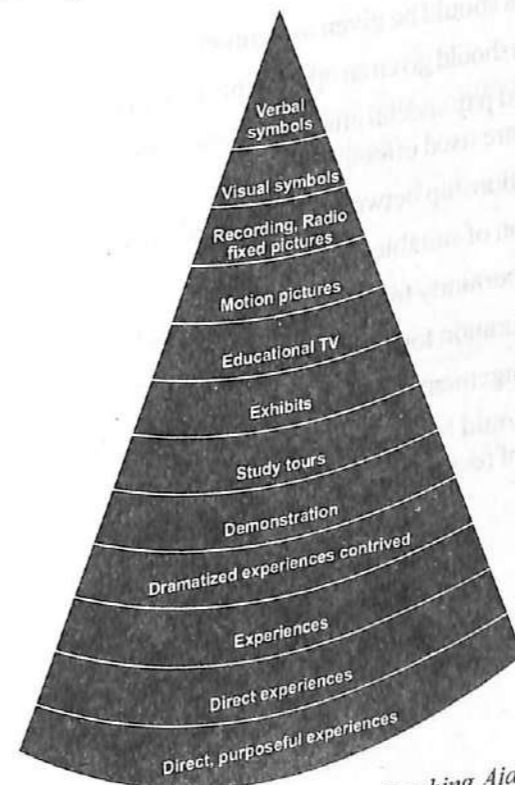


Figure 6.1 Relative Significance of Teaching Aids

## 6.2.2 Procedural Precautions in the Use of Teaching Aids

Teaching or audio-visual aids can be applied very effectively, if a teacher keeps the following in mind:

### NOTES

1. In relation to a teacher:
    - The importance and objective of the teaching aids
    - The students' needs and interests
    - The nature of the problem that needs to be communicated
    - The selected teaching aids should be reviewed and edited continuously.
  2. In relation to classroom:
    - The reason for selecting a particular teaching aid should be explained.
    - The students must be clear as to what is expected of them.
    - New terms and terminology being introduced, must be clearly explained to the students
  3. In relation to presentation of material:
    - The presentation should be effective
    - Time management must be appropriate
    - The response of students must be considered
  4. In relation to summary:
    - The teaching method should be reviewed and messages should be summarized from time to time.
    - The suspicions and doubts of the students should be clarified and eradicated
    - If necessary, students should be tested from time to time.
  5. In relation to feedback:
    - The students should be given assignments
    - The students should given an opportunity to apply the newly acquired knowledge.
- A teacher should pay special attention to the following aspects in order to ensure that the teaching aids are used effectively:
- A clear relationship between the aids and the instructional objectives
  - The selection of suitable teaching aids
  - Suitable opportunity for application of the aids
  - Adequate duration for application and experimentation
  - Proper arrangements for demonstration of the aids
  - The aids should be related to the subject matter and should not be a mere pastime or of recreational value

### NOTES

- They should match the behaviour of the students
- They should be of good quality and realistic
- They should be motivational
- They should be easily available
- They should be useful

A teacher should be careful when applying and preserving teaching aids. He/she should store them properly, and also take care to rectify defects, if any, by himself/herself. It is advisable to rehearse an experiment before demonstrating it with a teaching aid in the classroom. Teachers should also be fully trained in the use of teaching aids.

### Forms of Teaching Aids

Teaching aids can be divided into three forms:

1. **Visual aids:** Aids which can be seen
2. **Audio aids:** Aids which can be heard
3. **Audio-visual aids:** Aids which can be both seen and heard

### Importance of teaching aids in classroom teaching

The importance of teaching aids in classroom teaching can be encapsulated through following points:

- Attract the attention of the students quite effectively
- Have a high motivational impact
- Achieve permanent learning within a limited time frame
- Encourage the meaningful use of words and reduce verbosity
- Provide a first-hand experience
- Introduce an element of reality into the classroom
- Simplify the work of the teacher
- Reduce the monotony in the classroom
- Reduce the impact of a language barrier in the classroom
- Help to establish continuity in the thought flow
- Improve understanding
- Encourage self-activity

## 6.3 TYPES OF TEACHING AIDS

All teaching aids can be divided into two types:

1. Projected
2. Non-projected

### Check Your Progress

1. Give an application of an audio-visual teaching aid.
2. State a precaution to be exercised while using teaching aids.
3. Define audio visual aids according to E.C. Daint.

Teaching aids are described in Table 6.1.

Table 6.1 Description of Teaching Aids

Projected Aids	Non-Projected Aids				
Films	Charts	Blackboard	Objects	Radio	Field Trips
Film strips	Diagrams	Flannel board	Specimens	Tape recorder	Demonstrations Experiments
Slides	Maps	Bulletin board	Models	Television	Dramatization
Opaque-Projections	Graphs	Magnets	Diagrams		Teaching machines
Overhead Projection	Photographs				
	Cartoons				

We shall discuss some of these below:

**a. Film strip:** This contains stationary pictures (black-and-white or colour) on a 35-mm film strip. Most of the film strips have single frame pictures, but they may also contain double frames. Generally, a film strip has 20 to 30 frames and its length varies from two to five feet.

In order for the use of a film strip to be effective, its selection must be related to the topic, that is, whether or not it is needed for that topic. It should also be previewed before the class is prepared for its presentation and evaluation.

#### Advantages

- Simple and convenient to use
- Occupies less storage space and can be used anywhere
- Cheaper, and available in black-and-white or colour
- Pictures are sequenced and can be used in a room with dim lighting

**b. Projector:** This is a very important aid in which slides are projected on a large screen. A projector is of four main types. One, in which transparent pictures can be projected - this is an ordinary projector and is called a magic lantern. Second, is an opaque projector or episcoper in which opaque pictures can be projected, including the pages of a book. Third, is an epidiascope in which it is possible to project both transparent and opaque pictures. Fourth, is the film strip projector in which a cellulose acetate roll of 34 mm in width and 60 cm to 1.50 in length is used. This is a type of overhead projector in which slides are used.

In the same manner, a micro-projector can also be used to project very small objects. It can be used along with a microscope and is effective in the teaching of biology.

Yet another type of projecting appliance is the stereoscope. The key advantage of this appliance is that it can create a three-dimensional effect, due to which the picture appears to be real. In this, the objects come alive due to the coordination of the experiences of length, width, and depth.

**c. Charts:** The objective of a chart is to pictorially display a concept or principle which is otherwise difficult to understand through words. Generally, this is used to display the interrelationship between certain facts, figures or statistics, to present some data symbolically, to provide data in brief, to concretize the use of abstract concepts, to show continuity of a process, or to illustrate the development of a creation.

Generally, there are four types of charts used while teaching:

- Tree chart:** This type of chart is used to display the relationship between different factors and their development.
- Flow chart:** As is evident from its name, it is used for displaying the development of a process. In a flow chart, squares, rectangles and triangles are used to display obstruction, while lines are used to show direction or flow.
- Table chart:** These are extensively used for the comparative study of facts, or the demonstration of facts.
- Circular chart:** In a circular chart, a circle is divided into several parts or blocks, where each part represents a certain percentage. If the percentage values are very small, then their real percentage is also shown.

A teacher can use charts quite effectively. They must however make the effort of preparing the charts and also invite the participation of the students in this activity. These charts should be available to them easily, so that they can be used for teaching from time to time.

**d. Bulletin board:** This is a powerful medium to demonstrate pictures, figures, diagrams, books, and magazines. Its size should be relative to the blackboard being used; generally its size is 4' x 4' or 4' x 6'. It can be made from thermocol, soft board, or cardsheet. If cardsheet is being used, then it should be of adequate thickness.

The material to be displayed should be gathered by students under the guidance of the science teacher. A teacher can assign the management of the bulletin board to students in order to encourage them and create healthy competition among them. They can also reward students for their contributions.

The material to be displayed should be of adequate size and easily visible. If there are any pictures displayed, they should be clearly named or labelled. The titles of essays and articles should also be clear. A bulletin board may also be used as wall magazine or to display the activities of the department.

#### Objectives of the bulletin board

- Providing a means for communication
- Demonstration of student-made materials
- Making a brief presentation of the subject matter
- Displaying graphs and pictures attractively
- Motivating students and cultivating their interest and curiosity

#### Precautions in the use of bulletin board

- The subject matter being demonstrated should cover one topic at a time.
- The material that is selected for display should be suitable and contribute to the teaching.
- The planning of a bulletin board should be non-formal.

NOTES

NOTES



## NOTES

- The background colours used should be suitable.
  - Words should be large and clear enough and should be written attractively.
  - The displayed material should not lead to crowding of the bulletin board.
  - The displayed material should cultivate scientific interest in students.
- e. Diagrams:** A diagram is a simple drawing, in which inter-relationships are displayed using lines and symbols. This is an abstract representation of a complex object in which certain factors are absent and are represented using different types of symbols and materials. Therefore, a diagram should be prepared carefully before it is displayed in the class. The elements of a material are displayed symbolically, such as a line or an outline of an external figure. Care should be taken in the use of diagrams to ensure that the materials displayed pertain to a common subject or objective. Its outline should be clear and its nomenclature should be unambiguous.
- f. Graphs:** A graph is used to display numerical data figuratively. It is considered more effective than a table, because it also displays trends and variations, importance of facts, important relationships, principles, theories, processes, etc. in a simple and comprehensible manner. A good graph provides a lot of information without any detailed analysis.
- g. Blackboards or chalkboards:** A blackboard is the most used teaching aid in the teaching of science. It is easy and convenient to use, keeping in view the subject matter to be taught. Facts, principles, concepts, processes, etc. are easily displayed on the blackboard.
- It should be kept in mind that a blackboard is not overcrowded with a lot of information. The planning of a blackboard should be done in advance. Suitable lighting arrangement should be provided above a blackboard to ensure adequate visibility of the matter. Letters, words, and figures should be drawn clearly using thick lines.

**Advantages of blackboard or chalkboard:**

- This is an inexpensive option.
  - This combines the senses of seeing and hearing and is, therefore, quite effective.
  - It brings variety to the class and eradicates monotony in the classroom.
  - It is very effective for chemical, ratio, and mathematical calculations.
  - There is no need for any advance preparation before its use.
  - It is easily available.
- h. Flannel graphs:** This is also an effective aid for teaching science. This is a type of board whose size is generally 3' x 2' or 4' x 3', and can be prepared by cutting a piece of flannel into the desired size and fixing it on a piece of plywood. A flannel can also be spread out between two poles, or can be tied along two rollers, or suspended along the wall. A white flannel is the best however, flannel of other colours can also be used.
- On a flannel board, different types of figures and shapes, cut out on paper, can be displayed. The material should be pasted on thick paper or blotting paper.
- i. Plastic writing boards:** This is a transformed or modern form of a chalkboard. This is available in different and attractive colours and sizes.

## NOTES

**Advantages of a plastic writing board**

- Bright and attractive to look at
- No scratching sound at the time of writing
- Surface may be used as a projection screen
- Does not generate dust

- j. Magnetic boards:** This is a more developed form of a flannel board. In this, a special type of magnetic pin is used in the display of the material.

**Advantages of a magnetic board**

- This may be used as a pin board too.
- In this, the previously developed visual material and blackboard can be used together.

- k. Models:** At times, while teaching science, certain concepts cannot be explained even after a direct experience. At that time, the use of models becomes effective. A model is a three-dimensional form of a real object which has width, length, and depth in the manner of the real object. A model whose different parts can be separated is more useful in science teaching.

**Models are of three types:**

- i. Solid models:** These are used to display the outer form of an object. These are simple to make and easily used.
- ii. X-ray models:** These are used for the explanation theory and are the most effective and important from an educational viewpoint.
- iii. Working models:** These are used for the explanation of not only the shape and exterior form of an object, but also the operations and workings of the various parts of the object.

In day-to-day teaching of science, it is not possible to bring all types of real objects into the class or laboratory. The size of an object can be an obstruction. For example, it is not possible to bring into the class an aeroplane, a steam engine, or other such large machinery. In the same manner, very minute objects which are visible only through a microscope also cannot be displayed in the class in their real form. Besides this, objects which are not easily available or which cannot be generally seen, such as satellites, insects, etc., cannot be brought in the class. Models are used to impart knowledge about these things. A model is a three-dimensional teaching aid on the basis of which the students can be taught about different parts of the object including length, width, depth, their ratio, etc. Sometimes, a model can also be used for the study of a scientific process – for instance, a model can be made to display the lunar or solar eclipse.

Care should be taken while using models. It should be ensured that a model is an accurate representation of the object which it seeks to explain. Its size and shape should be of the same proportions as the real object. This will enable quick and adequate concept formation.

**l. Radio:** The radio and tape recorder are audio teaching aids and only stimulate the sense of hearing. Hearing is the only medium of communication; therefore, in the context of education, the development of the ability for disciplined and critical analysis through hearing is the only object of an audio aid.

## NOTES

A radio is a medium of transmitting and receiving signals created by magnetic waves. Hearing the radio enhances the level of knowledge of students. Its use has an effect on the development of social behaviour and logical thinking.

**Advantages of radio**

- i. **Motivation:** A radio can be very interesting and so it works as a motivator for students.
- ii. **Development of speech and hearing abilities:** Speech and hearing abilities are interrelated and have a strong influence on each other. A radio enables the development of these abilities.
- iii. **Inexpensive:** A radio is inexpensive as compared to other audio-visual teaching aids.
- iv. **Development of imaginative power:** Because a radio is based only on the hearing ability, it can be a stimulant for the cultivation of the students' imagination.

**Limitations of radio**

- i. It is a one-way communication. A student can neither ask any questions nor can he/she clarify his/her doubts.
- ii. It is necessary to have the student's attention in order for the communication to be effective. It may not be always possible to make all students attentive.
- iii. Radio programmes and school time tables are usually not coordinated.
- iv. Generally, the number of radio sets in a school is inadequate, so they cannot be used effectively as a teaching aid for all students.

**Uses of radio**

The following points should be kept in mind to ensure the successful operation of radio programmes:

- i. **Selection:** The programme guide should be used for selection of programmes. The programme guide helps a teacher in coordinating formal class teaching with relevant radio programmes.
- ii. **Physical condition:** Before operating a radio programme, a teacher should ensure that the sound does not vibrate in the class. The radio should be tuned properly and should be set away from any impediments which may distract the students.
- iii. **Learning conditions:** A teacher should cultivate students' interest before presenting a programme. For this, they should explain to students the key objectives of the programme, so that the students know what they are going to learn from the programme.
- iv. **Teacher's involvement:** A teacher should display the programme in such a manner so as to make the students feel that the radio programme is an active process and not a passive activity. For this, a teacher should explain the terminology, facts, and concepts being used in the radio programme.
- v. **Evaluation:** A teacher should ensure that the prescribed learning experiences are being covered during the period. This type of evaluation provides an effective basis for any future radio programmes.

## NOTES

**Steps to make radio programmes more effective**

Radio programmes can be made more effective and useful if the following steps are followed:

1. **Self-preparation:** For this:
  - The content of the programme should be known in advance.
  - The questions that will be asked after the programme should be listed.
  - If any other supplementary aids are used, then they must be adjusted accordingly.
2. **Classroom preparation:** For this:
  - The radio set should be kept ready before the class starts.
  - The radio programme and school clock should be coordinated.
  - The radio set should be tuned before time so that no time is wasted.
3. **Class preparation:** For this:
  - The programme to be heard should be discussed beforehand.
  - The programme should be related to the topic being studied.
  - If any assignment has to be given, due preparation should be done.
  - The summary of the programme content should be written on the blackboard.
4. **Listening to the programme:** For this:
  - The distracting elements should be removed.
  - The correct frequency and volume should be identified.
5. **Summary and follow up:** In this:
  - The summary of the earlier discussed points should be formed.
  - If there is any doubt, it should be clarified.
  - The entire experience should be summarized.
  - The points which require further explanation should be marked.

The instructional utility of radio has come to light recently. Keeping in view its importance, regular talks are now broadcasted by *Akashvani*. The BBC London too has been relaying these types of programmes for a long time now. *Akashvani* relays advance information about the speeches, talks, lectures, and dramas in its timetable keeping in view the needs and interests of students. It must be ensured that the radio is used only as a teaching aid in the classroom and not as a replacement for in-class teaching. This type of use of the radio can help students acquaint themselves with the latest progress and development in science. Even though the radio has extreme instructional utility, its widespread use is not feasible.

- m. **Television:** The television is one of the greatest achievements of the twentieth century. In the field of education too, it has brought about revolutionary changes. Its use has reduced the value of the radio to a great extent. While the radio can relay only sound, the television enables both sound and pictures to be received at the same time. Naturally, it helps to stimulate both audio and visual senses.

**Advantage of television in teaching**

1. **Combination of audio and visual impact:** Because both audio and visual senses are simultaneously used, it becomes all the more effective.
2. **Mass education:** Keeping in view the needs of the increasing population, television can be effectively used for mass education.

## NOTES

3. **Social equality:** The television is also indirectly useful in creating social equality as it has equal penetration in both rural and urban areas.
4. **Economical:** The subject matter taught by the medium of television is far more economical and inexpensive when compared to the use of other teaching aids, especially for the higher classes.
5. **Reduction of dependence on the school and teacher:** Because television is a powerful medium of individual instruction, it indirectly reduces the dependence of the students on the school and teacher.

**Limitations of education through television**

1. **One-way communication:** Like radio, communication through television is one-way. This makes it a passive aid, and does not allow any feedback. It negatively impacts the interest and creativity levels of the students.
2. **Individual differences:** It is not possible to ascertain the individual differences of students through this medium. Generally, different students have different speeds of learning and reception. Most television programmes are made keeping normal students in mind, so they are not very useful for talented or backward students.

Thus, television is used as a powerful medium in the field of teaching. This is among the newer tools, which combines the features of both radio and film. It can be very helpful to eradicate the shortcomings of a teacher and a laboratory. The *Doordarshan* has started a number of such programmes for this purpose, some of which are meant for teachers and others for students. Television should be used as a supplementary aid. Since the *Doordarshan* disseminates information about its programme schedules in advance, a teacher has sufficient time for preparation related to a specific programme. Like radio, a television programme can also be recorded on the video cassette recorder (VCR) for use at a later date. Suitable arrangements for this should be made at the time of viewing television programmes. The teacher should explain the highlights of the programme and students can subsequently be given suitable assignments related to it.

- n. **Tape Recorder:** A tape recorder is a very useful aid which can be used by a teacher effectively and easily. The greatest advantage of a tape recorder is that a teacher can use the recorded material at any time at their own convenience. The lecture of a scholar or any talk on the radio can be recorded which can be played in the class at a later time. In science teaching, several types of recordings can be made and introduced to the students. A tape recorder is a supplement to a gramophone. It is less expensive as compared to a gramophone, because a tape can be used a number of times as may be needed.

The following points should be kept in view while selecting a tape recorder:

- It should be light in weight so that it can be carried from one room to another together.
- It is even better if it is a two-in-one, that is, if it combines radio and stereo.
- It should be easy to operate.
- It should be sturdy so that it can be handled safely.
- It should not be very costly.
- It should be manufactured by a renowned company and should be bought from a shopkeeper who can provide after sale service.

## 6.4 CHARACTERISTICS OF GOOD TEACHING AIDS

## NOTES

The selection of suitable teaching aids is critical for the success of the learning process. An unsuitable selection may result in more harm than good, because this can create confusion in the minds of the students. A teacher should keep in mind the following while selecting teaching aids:

1. **Principle of selection:** The selected teaching aids must have certain basic traits. They should be important from an educational viewpoint. They must be interesting and able to motivate the students towards the learning goals. They should be result oriented, that is, focused on the achievement of the instructional objectives.
2. **Principle of preparation:** A teacher should devote himself/herself to making the students psychologically ready for the teaching aids. He/she must be familiar with the nature of the selected teaching aids. Before demonstrating the aids in the class, he/she himself must thoroughly inspect the teaching aids in all respects.
3. **Principle of proper presentation:** The teacher should ensure that the subject matter and the teaching aids are coordinated and related. Teaching aids should be used as supplementary tools, and the teacher should be fully proficient in their use.
4. **Principle of control:** The teaching aids should be under the control of the teacher during the entire period. There must be no situation wherein the teacher is unable to control or use the teaching aid properly.

## 6.5 IMPROVISED TEACHING AIDS

It is ironic to talk of low cost teaching aids in an age which deals with satellites and microprocessors. In present times, when technology is increasing its influence on teaching-learning circumstances, the question of human skill and craft becomes a moot point.

We do not foresee any increase in the finances available for teaching science in the country. Especially in the rural areas, the primary and secondary schools are facing an acute financial crunch, where the very thought of buying a teaching aid seems quite unrealistic.

In a developing country like India, the non-availability of teaching aids for experiments and demonstrations to teach science is a massive problem. The main reason for this is the lack of funds available to the schools. This has a negative impact on science teaching and causes the students to remain bereft of direct experiences. As the theories and principles cannot be verified, they have to acquire knowledge only on the basis of memory, which is not the best solution.

A teacher can make up for the absence of teaching aids to some extent by their devotion and loyalty. He/she will have to develop some self-made inexpensive teaching aids in order to make his/her teaching effective and well-organised. Inexpensive aids means those aids which can be made from material which is easily available, which are low cost, and which can be made by both teachers and students. It may be created using things which are available in daily life. A science teacher can use the *UNESCO Source Book of Science Teaching* published by the Oxford University Press and the *Methods and Materials for Teaching Biological Science: Student Edition* by Muller and Blaydes, published by McGraw Hill for making inexpensive teaching aids.

### 6.5.1 Value of Improvisation

Improvisation has following values:

1. **Economic value:** Self-made teaching aids are a boon from the viewpoint of the economic resources of a school. Their cost is far lower when compared to the expensive aids bought from the market. It helps to make the science classroom of the school self-dependent.
2. **Educational and psychological value:** The aim of teaching is to bring about desirable, cognitive, affective, and psychomotor changes in the students. This is not possible unless both body and mind are coordinated. This possibility increases while developing self-made teaching aids. Also, the students get a medium to express their creative instincts.

Self-made aids become effective means in the transformation and redirection of conceptual instincts in desirable directions. They are important from the psychological viewpoint also. They provide an opportunity for the expression of the individual differences and interests of students. It cultivates a sense of self-satisfaction brought about by their creative achievement. The students also learn to evaluate their own activities, and this encourages self-discipline. From an educational viewpoint also, self-made aids lead students to make effective use of their leisure time and thus reduce time wastage.

3. **Social value:** The chief achievement of self-made teaching aids from the viewpoint of social value is that it helps the students to cultivate dignity of labour.

### 6.6 SUMMARY

- Good's *Dictionary of Education* defines audio visual aids as anything by means of which the learning process may be encouraged or carried out through the sense of hearing or the sense of sight.
- Merely collecting or assembling teaching aids is not a measure of success of the teaching process. It is also essential that these aids are used effectively. To achieve this, a teacher ought to know when and how to use them.
- Edger Dale has presented the relative significance of teaching aids in his book *Audio-Visual Methods in Teaching*, in the form of a cone of experience. The cone of experiences encourages direct and purposeful experiences which makes the learning meaningful. Intensive direct experiences enable permanent learning.
- The selection of suitable teaching aids is critical for the success of the learning process. An unsuitable selection may result in more harm than good, because this can create confusion in the minds of the students.
- In a developing country like India, the non-availability of teaching aids for experiments and demonstrations to teach science is a massive problem. The main reason for this is the lack of funds available to schools.
- A teacher can make up for the absence of teaching aids to some extent by their devotion and loyalty. He/she will have to develop some self-made inexpensive teaching aids in order to make his/her teaching effective and well-organised.

#### Check Your Progress

4. Give two examples of non-projected teaching aids.
5. What are three types of charts not used to teach?
6. What do you mean by inexpensive aids?

### 6.7 KEY TERMS

- **Cellulose Acetate:** These are compounds, which are insoluble in water and are formed especially by the action of acetic acid, anhydride of acetic acid, and sulphuric acid on cellulose and are used for making textile fibres, packaging sheets, photographic films, and varnishes.
- **Gramophone:** A gramophone, like a cassette player, CD player, or MP3 player, is a device for playing music. A gramophone plays records: discs with grooves that are amplified by a needle.

### 6.8 ANSWERS TO 'CHECK YOUR PROGRESS'

1. Audio-visual aids can be used for presenting and describing large machinery, industries, etc.
2. A precaution that is to be exercised while using teaching aids is that the selected teaching aids should be reviewed and edited continuously.
3. According to E.C. Daint, audio-visual aids encompass all the material that helps to understand the written or oral subject matter in the classroom or in other teaching situations.
4. Radio and field trips are two examples of non-projected teaching aids.
5. Three types of charts used to teach are tree chart, flow chart, and table chart.
6. Inexpensive aids means those aids which can be made from material which is easily available, which are low cost, and which can be made by both teachers and students. It may be created using things which are available in daily life.

### 6.9 QUESTIONS AND EXERCISES

#### Short-Answer Questions

1. What is the importance of teaching aids in the classroom?
2. Write a short note on Edgar Dale's Cone of Experience.
3. State the characteristics of good teaching aids.

#### Long-Answer Questions

1. Discuss the uses of teaching aids and the precautions one has to keep in mind while using it.
2. Explain the types of teaching aids in detail.
3. Describe the need and use of improvised teaching aids.

### NOTES



## 6.10 FURTHER READING

- Bernard, H.C. 1961. *An Introduction to Teaching*. London: London University Press.
- Bhatia, K and Bhatia, B.D. 1959. *Principles and Methods of Teaching*. Delhi: Doaba House 1988.
- Chauhan, S. S. 2010. *Innovations in Teaching Learning Process*. New Delhi: Vikas Publishing House.

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## UNIT 7 EDUCATIONAL EVALUATION

### Structure

- 7.0 Introduction
- 7.1 Unit Objectives
- 7.2 Concept of Educational Measurement
  - 7.2.1 Types of Measurement
  - 7.2.2 Characteristics of Good Measurement Tool
- 7.3 Concept of Evaluation
  - 7.3.1 Characteristics of Evaluation
  - 7.3.2 Types of Evaluation Procedures
- 7.4 Examination Reforms
  - 7.4.1 Choice Based Credit System (CBCS)
  - 7.4.2 Continuous and Comprehensive Evaluation (CCE)
- 7.5 Summary
- 7.6 Key Terms
- 7.7 Answers to 'Check Your Progress'
- 7.8 Questions and Exercises
- 7.9 Further Reading

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### 7.0 INTRODUCTION

The process of measurement is an essential component of the learning system. The measurement has more administrative utility in education than evaluation. An evaluation process is useful in modifying and improving learning system and instructional procedure. The measurement is more precise and objective in approach when compared to evaluation. Measurement is always done of a quality, attribute or variable of a thing or a person. The psychologists and educationists are mainly concerned with the variables and attributes. The process of measurement converts the variables into variety which is used for drawing the inferences. For example, intelligence is quantified in terms of IQ and achievement variable is measured in terms of scores. In this unit, we will discuss these concepts of educational measurement and evaluation, along with its types. We will also discuss various reforms that have occurred in the examination mode.

### 7.1 UNIT OBJECTIVES

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

- Discuss the concept of educational measurement and evaluation
- Describe the types of evaluation procedures
- Explain the various reforms that have taken place in the examination mode

### 7.2 CONCEPT OF EDUCATIONAL MEASUREMENT

Measurement refers to the process by which the attributes or dimensions of some physical object are determined. When used in the context of learning, it would refer to applying a standard scale or measuring device to an object, series of objects, events, or conditions, according to practices accepted by those who are skilled in the use of the device or scale.

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E.L. Thorndike stated that 'anything that exists at all, exists in some quantity; and anything that exists in some quantity is capable of being measured'. Measurement of any kind is a matter of determining how much or how little, how great or how small, how much more than or how much less than an object or an event is. The *Encyclopedia of Educational Research* explains measurement in more refined terms; to measure means 'to observe or determine the magnitude of a variant'. Measurement answers the question of 'how much'. In our day-to-day life, we measure the height, weight, miles travelled, etc., the tailor measures the dimensions of an individual's body to prepare dress according to required size, a shopkeeper weigh different commodities like rice, wheat, sugar, fruits, and scales. The ranking of contestants in a debate competition can be considered as measurement, rating of human behaviour comes under measurement. Hence, a set of persons or objects according to certain established rules'.

James M. Bradfield defined measurement as 'the process of assigning symbols to the dimension of phenomenon in order to characterize the status of phenomenon as precisely as possible'. J.P. Guilford defined measurement as the 'assignment of numerals to objects or events according to certain rules'. According to Norman E. Gronlund, 'measurement results are some score or numerical value and quantitative descriptions of the pupils'.

Measurement involves the process of quantification. Quantification indicates to what extent a particular attribute is present in a particular object. It has been observed that measurement in any field always involves three essentials:

- (i) Identification and definition of quantity, attribute, or variable that is to be measured.
- (ii) Determining the set of operations by which the attribute or variable may be made perceivable.
- (iii) Establishing a set of procedure for translating observations into quantitative statement of degree, extent, or amount.

### 7.2.1 Types of Measurement

Measurement is of two types: (i) physical measurement and (ii) mental measurement/psychological measurement/educational measurement.

(i) **Physical measurement:** Physical measurement is the measurement of the object which has absolute existence. For example, we measure height of individuals, the weight of rice, etc. Here, we directly measure the height or weight of an individual and all the measuring tools of physical measurement start from zero. Physical measurement is always accurate and quantitative, and there are some set of tools for physical measurement all over the world.

(ii) **Mental measurement:** Mental measurement is also known as 'educational measurement' or 'psychological measurement'. It is always relative and there is no absolute zero in case of mental measurement. For example, for measuring the intelligence of a person we have to take the help of an intelligence test which is a subjective one. Through his/her response, we can know the level of intelligence of the person concerned. Mental measurement is both qualitative and quantitative in nature, and there are no fixed tools for such measurement that is, the same set of tools may not be applied to different types of persons.

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The application of the principles of measurement in the field of education is known as 'educational measurement'. In the educational system, measurement is the quantitative assessment of performance of the students in a given test. It can be used to compare performance between different students and to indicate the strengths and weaknesses of the students. It helps in classifying students into homogenous group to assign educational and vocational guidance and to provide remedial measures to the low achievers. Measurement is a tool used by the educational psychologists to study human behaviour. The educational psychologists take the help of different valid and reliable psychological tests to know the level of different traits within an individual. The different kinds of such tests are intelligence test, achievement test, attitude test, aptitude test, interest inventory, personality test, etc. The methods used for these tests are: observation, interview, checklist, rating scale, examinations, cumulative record card, anecdotal records, etc.

In the teaching-learning situation, teachers should be competent enough to measure the student's achievement, intelligence, attitude, aptitude, etc. To develop competency among the teachers in educational measurement, Ebel has suggested the following measures:

- (i) Know how to administer a test properly, efficiently, and fairly.
- (ii) Know how to interpret test scores correctly and fully, but with recognition of their limitations.
- (iii) Know how to select a standardized test that will be effective in a particular situation.
- (iv) Know how to plan a test and write the test questions, to be included in it.
- (v) Know the educational uses as well as the limitations of educational tests.
- (vi) Know the criteria by which the quality of a test should be judged and how to secure evidence relating to these criteria.

### 7.2.2 Characteristics of Good Measurement Tool

To measure the psychological traits with validity and reliability, the measuring instrument or tests should avoid having personal errors, variable errors, constant errors, and interpretative errors. The important characteristics of good measuring tools are as follows:

- (i) **Should be valid:** Validity of a test refers to its truthfulness. It refers to the extent to which a test measures what it actually wishes to measure. Suppose we want to know whether a Numerical Reasoning Test is valid. In that case, if it really measures the reasoning ability, the test can be said to be valid.
- (ii) **Should be reliable:** Reliability refers to the consistency of a measuring instrument (how accurately it measures). It refers to the faithfulness of the test. To express in a general way, if a measuring instrument measures consistently, it is reliable. For example, a test is administered on English to the students of class VI. In this test, Ram scores 50. After a few days, the same test is administered and Ram scores 50. Here, the test is reliable because there is consistency in the result.
- (iii) **Should be objective:** Objectivity of a test refers to two aspects: (a) item objectivity (that is, objectivity of the items), and (b) scoring objectivity (that is, objectivity of scoring). By 'item objectivity' we mean that the items of the test must need a definite single answer. If the answer is scored by different examiners the marks would not vary. Ambiguous questions, lack of proper direction, double barrelled

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- questions, questions with double negatives, and essay-type questions must be avoided because they lack objectivity. By 'objectivity of scoring' we mean that by whomsoever scored, the test would fetch the same score. Thus, mostly the objective-type questions should be framed to maintain the objectivity of the test.
- (iv) **Should be usable and practicable:** 'Usability' refers to the practicability of the test. In the teaching-learning situation, by usability we mean the degree to which the test (or the measuring tool) can be successfully used by teachers and school administrators.
- (v) **Should be comprehensive and precise:** The test must be comprehensive and precise. It means that the items must be free from ambiguity. The directions to test items must be clear and understandable. The directions for administration and for scoring must be clearly stated so that a classroom teacher can easily understand and follow them.
- (vi) **Should be easy in administering:** If the directions for administration are complicated or if they involve more time and labour, the users may lag behind. For example, Wechsler Adult Intelligence Scale (WAIS) is a good test, but its administration is very difficult.
- (vii) **Should be economical:** A measurement tool should be less time consuming. The cost of the test must be reasonable, so that the schools/educational institutions can afford to purchase and use it.
- (viii) **Should be easy in scoring:** The scoring procedure of the test should be clear and simple. The scoring directions and adequate scoring key should be provided to the scorer so that the test is easily scored.
- (ix) **Should be easily available:** Some standardized tests are well-known all over India, but they are not easily available. Such tests have less usability. It is desirable that in order to be usable, the test must be readily and easily available.
- (x) **Should have good and attractive appearance:** The quality of papers used, typography and printing, letter size, spacing, pictures and diagrams presented, binding, space for pupil's responses, etc., should be very good and attractive.

### 7.3 CONCEPT OF EVALUATION

Evaluation is an act or process that assigns 'value' to a measure. When we are evaluating, we are making a judgment as to the suitability, desirability, or value of a thing. In the teaching-learning situation, evaluation is a continuous process and is concerned with more than the formal academic achievement of students. Evaluation refers to the assessment of a student's progress towards stated objectives, the efficiency of the teaching, and the effectiveness of the curriculum. Evaluation is a broad concept dealing not only with the classroom examination system, but also evaluating the cognitive, affective, and psychomotor abilities of the students. The success and failure of teaching depends upon teaching strategies, tactics, and aids. Thus, evaluation approach improves the instructional procedure. Glaser's basic model of teaching refers to this step as a 'feedback function'.

J.M. Bradfield defines evaluation as 'the assignment of symbols to phenomenon in order to characterize the worth or value of the phenomenon usually with reference to

#### Check Your Progress

1. What do you mean by physical measurement?
2. Define educational measurement.
3. Mention any four measures suggested by Ebel to develop competency among the teachers in educational measurement.

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some social, cultural and scientific standards'. Wright Stone stated, 'evaluation is a relative new technical term introduced to designate a more comprehensive concept of measurement than is implied in conventional test and examination'. Hanna defined evaluation as 'the process of gathering and interpreting evidence on change in the behaviour of all students as they progress through school'.

Evaluation takes place with the help of test and measurement. In the classroom situation, the teachers first use classroom tests to evaluate the students according to their different traits. After getting the answer papers, the teachers now provide some numerals to the answer papers, this step is known as measurement. So measurement deals only with the quantitative description. After the measurement step, now the teachers arrange the students as first, second, third, etc., according to their achievements. This step is evaluation. So evaluation is a philosophical and subjective concept. It includes both quantitative and qualitative descriptions, and value judgement.

Therefore, Evaluation = Quantitative Description (Measurement) and/or Qualitative Description (Non-measurement) + Value Judgements.

#### 7.3.1 Characteristics of Evaluation

The characteristics of evaluation are as follows:

- It is a systematic process.
- It measures the effectiveness of learning experiences provided.
- It measures how far the instructional objectives have been achieved.
- It uses certain tools like tests, observation, interview, etc.
- It is a continuous process.
- It is a subjective judgement.
- It is philosophical in nature.
- It includes quantitative description, qualitative description, and value judgement.
- It gets data from measurement.
- It not only determines the magnitude, but also adds meaning to measurement.
- It involves values and purposes.

#### 7.3.2 Types of Evaluation Procedures

In order to know the amount of knowledge that the students have accumulated previously, to find out about the effectiveness of instructional objectives, and to diagnose the problems that exist in the way of students goals, the teachers use four types of evaluation. These four types of evaluation are as follows:

- (i) **Placement evaluation:** Through this evaluation, the entry behaviour of the student is assessed. It is like round peg in the round hole and square peg in the square hole. In this case, the students are given admission to new courses according to their intelligence, attitude, motivation, aptitude, etc. This type of evaluation questions: Does the student possess the knowledge and skills needed to begin the planned instruction? To what extent has the student already developed the understanding and skills that are the goals of the planned instruction? To what extent do the student's interests, work habits, and personality characteristics indicate that one

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mode of instruction might be better than the other? The goals of placement assessment are to determine for each student the position in the instructional sequence and the mode of instruction that is most beneficial. For example, the B.Ed. entrance test is conducted to give admission to the students' in B.Ed. course. This type of evaluation is called 'placement evaluation'.

(ii) **Formative evaluation:** It aims at the evaluation of student's learning progress during the period of instruction. Formative evaluation views evaluation as a process, and thus, it is an integral part of the learning process. It is not terminal in character. Formative evaluation is concerned with both achievement of students during a course of instruction and its improvement. Formative evaluation is a tool of providing feedback to the teaching-learning process. It is concerned with the teacher, content, instructional objectives, and provision of learning experiences. Formative evaluation also helps the teacher to modify the instructional objectives, and the methods of teaching if necessary. Formative assessment depends heavily on especially prepared tests and assessments for each segment of instruction. The unit tests, the weekly tests, monthly tests, etc. are the examples of formative evaluation.

(iii) **Diagnostic evaluation:** It is concerned with the persistent learning difficulties that are left unresolved by the corrective prescriptions of formative assessment. It aims at identifying or diagnosing the weaknesses of students in a given course of instruction. Diagnostic evaluation involves the use of especially prepared diagnostic tests and various observational techniques. The aim of diagnostic assessment is to determine the causes of persistent learning problems of students and to formulate a plan for remedial action. When a teacher finds that in spite of the use of various alternative methods and techniques, the student still faces learning difficulties, he/she takes recourse to a detailed diagnosis. This type of evaluation includes vision tests, hearing tests and other tests used to determine how the student approaches a reading assignment, that is, does the student rely on pictures, sound of words, use of context clues, or skip over unfamiliar words.

(iv) **Summative evaluation:** This evaluation comes at the end of a course of instruction. It is designed to determine the extent to which the instructional goals have been achieved, and is used primarily for assigning course grades or for certifying student mastery of the intended learning outcome. Summative evaluation's chief functions are: 'crediting' and 'certifying' the level of achievement of the students, and selecting the students for different courses. It is judgemental and terminal in character. Summative evaluation judges the achievement of students and the efficacy of school programmes, and guides whether the programme or the system is to be accepted or not. University annual examination is an example of summative evaluation.

#### Evaluation from educational angle

Anything to be evaluated has certain aims and objectives, and through evaluation we assess how far these objectives have been fulfilled. From an educational angle, we can evaluate many aspects which are the part and parcel of an educational system such as:

- (i) Evaluation of a school site (with reference to its location, building, hygiene strength of students and teachers, etc.)

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- (ii) Evaluation of a school programme (school syllabus, co-curricular activities, guidance programmes, etc.)
- (iii) Evaluation of teaching methods (with reference to aims, purposes, suitability, and efficacy)
- (iv) Evaluation of total programme of instruction (with reference to cognitive, affective, and psychomotor domain)
- (v) Evaluation of school administration; discipline, control, management, and organization
- (vi) Evaluation of the textbooks
- (vii) Evaluation of students' growth

The steps involved in an evaluation process take place in a hierarchy. These steps are:

- Evaluating
- Planning of appropriate learning experiences
- Selecting appropriate teaching points
- Specification of desired student behaviour
- Identification and definition of specific objectives
- Identification and definition of general objectives

## 7.4 EXAMINATION REFORMS

Higher education in India has seen many changes in the last 50 years. After the Kothari Commission report in 1966, a debate on college autonomy began which resulted in a few colleges becoming autonomous in 1978; a few of them have completed 25 years of this freedom. Academic freedom has led colleges to formulate new curricula, start relevant courses, design new syllabi, and establish new evaluation techniques. These have made the Indian education system more comprehensive and modern. Let us learn more about the new methods in the following sections.

### 7.4.1 Choice Based Credit System (CBCS)

Research and experience has revealed that the learner-centric contextual curriculum recommended and the desired learner outcomes projected can be achieved mainly through Choice Based Credit System (CBCS). The system, which is implemented in most of the universities of North America and Europe, is considered a fundamental tool for transforming the orthodox and outdated system of higher education in India. CBCS functions on a modular pattern based on module/units called 'credits'. Here, credit defines the quantum of contents/syllabus set for a course/paper which decides the minimum number of teaching-learning hours required. One credit denotes 15 hours of instructions per semester. CBCS permits students to:

- Learn at their own pace
- Select subjects from a broad range of electives offered by the university
- Opt for supplemental/value added courses and obtain more than the requisite credits, based on the learner's capabilities

#### Check Your Progress

4. How does an evaluation take place in a classroom?
5. State the steps involved in an evaluation process.



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- Implement an interdisciplinary approach in education
- Utilize the expertise of faculty across the university apart from the specific department faculty
- Acquire knowledge, skill and attitude of learning outcomes through participatory teaching and learning and continuous evaluation process

**7.4.2. Continuous and Comprehensive Evaluation (CCE)**

The term Continuous and Comprehensive Evaluation (CCE) refers to the two important and essential conditions of evaluation. These are: (i) continuous evaluation and (ii) comprehensive evaluation. The meaning of continuous evaluation is that the evaluation of learners at levels of schools should be done on continuous basis, that is, throughout the year or session rather than only at the end of a session, course, or class. The evaluation system for students' achievement in all domains of personality development should be scattered throughout the course such as on weekly basis, monthly basis, and quarterly basis or through unit-end test and chapter-end test. This type of evaluation is called continuous evaluation and it is done by the teachers of the school, therefore, it is also called internal assessment or evaluation. Internal evaluation mechanism puts teachers as well as students focused on teaching and learning and, therefore, gives better results as compared to one-time evaluation which is done at the end of the course. The whole academic session is utilized properly by the teachers and the students.

The other aspect is comprehensive evaluation which means that the evaluation process should cover all aspects of personality development of the students, that is, scholastic as well as non-scholastic areas. There have been drawbacks in our evaluation system for a long time. The main flaws have been that the evaluation system has been lop-sided, that is, evaluating only one or two domains, the cognitive and psychomotor. Even in these two domains, it only evaluates the cognitive domain in depth and mostly ignores psychomotor domain. It neglects the affective domain completely. Under comprehensive evaluation of learners, there is a consideration that their interests, attitudes, values, personal and social qualities, and proficiencies in co-curricular activities should be taken proper care of along with the development of cognitive and psychomotor abilities that is, knowledge, understanding, application, analysis, synthesis, evaluation, and skill in the area of study. Continuous and comprehensive evaluation is essential for promoting the all-round development of the learners. The all-round development of the children or learners at any level of education involves the development of both scholastic and non-scholastic areas of pupils' personality, that is development in all the three domains—cognitive, affective, and psychomotor domains of personality.

H. S. Srivastava, ex-professor and head of NCERT's department of educational measurement and evaluation, has given a scheme of continuous and comprehensive evaluation in his book titled *Comprehensive Evaluation in Schools* published by NCERT (National Council of Educational Research and Training) in 1989. Table 7.1 depicts the scheme of continuous and comprehensive evaluation adapted from the scheme given in H. S. Srivastava's book.

Table 7.1 Scheme of Continuous and Comprehensive Evaluation

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SCHOLASTIC AREAS	
<p><b>A. Curricular Areas</b></p> <ol style="list-style-type: none"> <li>1. Knowledge</li> <li>2. Understanding</li> <li>3. Application</li> <li>4. Analysis</li> <li>5. Synthesis</li> <li>6. Evaluation</li> <li>7. Skills</li> </ol>	<p><b>I. Evaluation Techniques:</b></p> <ol style="list-style-type: none"> <li>(i) Written</li> <li>(ii) Oral</li> <li>(iii) Practical or Performance Test</li> </ol> <p><b>II. Tools for Evaluation:</b></p> <ol style="list-style-type: none"> <li>(i) Teacher-made test (Questionnaire, Diagnostic Unit and Performance Test)</li> <li>(ii) Standardized achievement test</li> <li>(iii) Assignments or home-work</li> <li>(iv) Quizzes</li> <li>(v) Debate and group discussion</li> <li>(vi) Extempore</li> <li>(vii) Seminar</li> </ol> <p><b>III. Periodicity of Evaluation:</b></p> <ol style="list-style-type: none"> <li>(i) Weekly, bi-weekly, monthly, quarterly, etc.</li> <li>(ii) Terminal tests</li> <li>(iii) Random tests</li> </ol> <p><b>IV. Coverage: All students</b></p>
<p><b>B. Intelligence</b></p>	<p><b>I. Evaluation Techniques:</b></p> <ol style="list-style-type: none"> <li>(i) Performance tests</li> <li>(ii) Paper-pencil tests</li> </ol> <p><b>II. Tools of Evaluation: Standardized tests of intelligence and performance</b></p> <p><b>III. Periodicity of Evaluation: Yearly, at the beginning of the academic year.</b></p> <p><b>IV. Coverage: All students</b></p>
NON-SCHOLASTIC AREAS	
<p><b>A. Personal and Social Qualities:</b></p> <ol style="list-style-type: none"> <li>1. Regularity</li> <li>2. Punctuality</li> <li>3. Discipline</li> <li>4. Cleanliness</li> <li>5. Emotional stability</li> <li>6. Initiative</li> <li>7. Cooperation and coordination</li> <li>8. Sense of responsibility</li> <li>9. Hard-working</li> <li>10. Civic sense</li> <li>11. Spirit of social service</li> <li>12. Tense or relaxed</li> <li>13. Patient or impatient</li> <li>14. Achievement orientation</li> <li>15. Domineering</li> </ol>	<p><b>I. Techniques of Evaluation: Observation (Direct and Indirect)</b></p> <p><b>II. Tools of Evaluation:</b></p> <ol style="list-style-type: none"> <li>(i) Anecdotal records</li> <li>(ii) Rating scales</li> <li>(iii) Observation schedule</li> <li>(iv) Checklist</li> </ol> <p><b>III. Periodicity of Evaluation:</b></p> <ol style="list-style-type: none"> <li>(i) Regularly (Continuous evaluation)</li> <li>(ii) Grading once in each term based on continuous evaluation</li> </ol> <p><b>IV. Coverage: All students</b></p>

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NON-SCHOLASTIC AREAS	
<p><b>B. Interests:</b></p> <ol style="list-style-type: none"> <li>Literary</li> <li>Scientific</li> <li>Musical</li> <li>Artistic</li> <li>Social service</li> </ol> <p><b>C. Attitudes:</b></p> <ol style="list-style-type: none"> <li>Towards teachers</li> <li>Towards parents and society</li> <li>Towards studies</li> <li>Towards class/schoolmates</li> <li>Towards school activities</li> <li>Towards school assets</li> <li>Towards nature and environment</li> </ol> <p><b>D. Physical Health:</b></p> <ol style="list-style-type: none"> <li>Height</li> <li>Weight</li> <li>BMI (Body Mass Index)</li> <li>Chest expansion</li> <li>Physical defects (if any)</li> <li>Eye defects</li> <li>Hearing capacity</li> <li>Teeth</li> <li>History of disease (if any)</li> </ol>	<p>These interests and attitudes should be graded on 5-7-9 point scales. If neither positive nor negative aspect is observed in a student for any particular personal or social qualities, interests and attitudes, then the student should be given the average grade or middle value.</p> <p><b>I. Techniques of Evaluation:</b></p> <ol style="list-style-type: none"> <li>Medical check up by doctor</li> <li>Observation by teachers (Class teacher as well as physical education teacher)</li> </ol> <p><b>II. Tools of Evaluation:</b></p> <ol style="list-style-type: none"> <li>Rating scales</li> <li>Observation schedule</li> <li>Medical instruments to be used by the medical specialist/doctor</li> </ol> <p><b>III. Periodicity of Evaluation:</b> Once every six months or as fixed by the higher authority</p> <p><b>IV. Coverage:</b> All students</p>
OTHER AREAS (Educational, Sports, Cultural Activities etc.)	
<p><b>A. Literary and Scientific</b></p> <ol style="list-style-type: none"> <li>Library work</li> <li>Debate</li> <li>Recitation</li> <li>Creative writing</li> <li>Talks</li> <li>Clubs</li> <li>Museums</li> </ol> <p><b>B. Cultural</b></p> <ol style="list-style-type: none"> <li>Drawing and painting</li> <li>Drama</li> <li>Music</li> <li>Dance</li> <li>Sculpture</li> <li>Artistic embroidery</li> </ol> <p><b>C. Outdoor Activities</b></p> <ol style="list-style-type: none"> <li>Games and sports</li> <li>Swimming</li> <li>Gymnastics</li> <li>N.C.C.</li> <li>N.S.S.</li> <li>Scouting</li> <li>First aid</li> <li>Junior Red Cross</li> <li>Community surveys and services</li> <li>Community-based craft</li> </ol>	<p><b>I. Techniques of Evaluation:</b></p> <ol style="list-style-type: none"> <li>Observation</li> </ol> <p><b>II. Tools of Evaluation:</b></p> <ol style="list-style-type: none"> <li>Observation schedule</li> <li>Rating scale</li> <li>Anecdotal records</li> </ol> <p><b>III. Periodicity of Evaluation:</b> At least once every month</p> <p><b>IV. Coverage:</b> Library work for all students and minimum one of the remaining literary, scientific and cultural activities for each student</p> <p><b>I. Techniques of Evaluation:</b></p> <ol style="list-style-type: none"> <li>Proficiency test</li> <li>Observation</li> </ol> <p><b>II. Tools of Evaluation:</b></p> <ol style="list-style-type: none"> <li>Observation schedule</li> <li>Anecdotal record</li> <li>Rating scales</li> <li>Performance test</li> </ol> <p><b>III. Periodicity of Evaluation:</b> Monthly</p> <p><b>IV. Coverage:</b> Games and sports for all students and minimum one of the remaining activities for each student</p>

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Other elements that make up the system of continuous and comprehensive evaluation are assignments, periodic tests, progress report and cumulative records. Let us study each of these in detail.

**(a) Assignments:** According to Chambers 21st Century Dictionary, 'assignment' means 'a task or duty that has been selected for someone to do' or an 'an exercise that is set for students'. It is used as a teaching method in all subjects at secondary and senior secondary levels. Considering the subject of study, nature of content, and the time available, the subject teacher determines the number of assignments for the academic calendar. While designing assignments, the subject teacher takes care of the abilities, interests, and levels of the class and the group who has to work on the assignment.

An assignment combines the merits of lecture-cum-demonstration method and the individual laboratory method. The success and the effectiveness of this method totally depends on proper development and planning of the assignments.

The assignment given to students to work at secondary and senior secondary levels may be classified into the following two categories:

**1. Home assignment**

This is the assignment given to the student to complete at home and includes writing of answers to questions, problem solution, reading text, etc. These assignments are given by teachers. Along with the assignment, the teacher also gives references from different sources concerning the topic so that the students can take help from them. Learners go through the textbooks, reading materials and other sources referred by the teacher, and grasp the idea of the assignment. They may consult libraries, seniors, and other sources available to them. They prepare the answers to the questions or solve the problem given to them by the teacher. They bring the assignment file to the school and hand it over to the concerned teacher for evaluation. The teacher evaluates the answers, gives grades or marks as per the provision, and tries to find out discrepancy (if any) therein. The teacher also gives feedback to the students for improvement in future. The feedback may include:

- Further reading required by the student
- Any textbook which should have been consulted by the student
- Suggestion whether the answers were up to the mark or needed improvement
- Advice on what special matter could have been added in the answers
- Suggestion about the presentation of ideas/answers
- Any other suggestion that may have been considered by the teacher or the examiner

**2. School assignment**

It is the assignment which is prepared or planned at home and performed or conducted in the school or laboratory. Assignment of this category includes performing experiments in the laboratory and preparing answers of the questions that have been put up by the teacher. School assignments can be divided into the following two parts:

- Preparatory part:** In this part, the teacher demonstrates experiments to the class. He/she conducts those experiments in front of students which are difficult, complex, and carry some risk, or those experiments which require costly apparatus to be used with precautions. Students observe the demonstration and participate in the discussion with the teacher. Those experiments which are simple in nature,

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- Chances of copying are much higher in this method of teaching.
- It hinders in timely completion of the syllabus.
- It requires well-equipped library and laboratory, and resourceful teachers, which are rarely available to the students.
- All of the content area cannot be taught through this method. It has its own limitation.

### Practical suggestions for making assignment method a success

Through the following suggestions, the assignment method can be made successful:

- Apply this method in secondary and senior secondary classes because students at this level are mature enough to work on assignments.
- The teacher must plan well and select the relevant topics which may be completed through assignments. While selecting topics for assignments, students' interest, intelligence, age, aptitude, creativity, and resource availability must be kept in mind.
- Teacher should be satisfied with the preparatory work of the students before giving them permission for carrying out practicals in the lab or field work.
- Progress of the students in the assignments must be checked by the teacher on regular basis.
- Teacher should be available to the students at all time for any kind of help they may need. It makes students confident and ensures proper help and guidance in the hour of need.

**(b) Periodical and annual tests:** The tests which are conducted on regular intervals are referred to as periodical tests. These tests are very important as far as the continuous and comprehensive evaluation is concerned. Some of the important types of periodical tests are as follows:

1. **Weekly test:** It is conducted every week on a particular day fixed by the teacher.
  2. **Unit test:** It is conducted at the end of every unit. In general practice, this test is conducted on any one day of the week on a regular basis. Students generally call it by the names of the day on which it is conducted like 'Monday Test', 'Tuesday Test', etc. Generally, weekly tests and unit tests are the same.
  3. **Monthly test:** This test is conducted on monthly basis. The content of this test covers that part of the syllabus which has been covered during the month.
  4. **Quarterly test:** This test is conducted in every three months. The syllabus of the test covers that part of the syllabus which has been completed during the three months' period.
  5. **Half-yearly test:** This test is conducted in every six months and it constitutes that part of the syllabus which is prescribed for the six months.
  6. **Annual test:** This is the final test or summative test for the whole academic year. It covers the entire syllabus and is conducted to judge the overall achievement of the students. Results are declared on the basis of this test.
- The periodical tests are very important as far as the achievements of the students are concerned. Teachers as well as students work very hard throughout the year for

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achieving the objectives of education in that particular academic year. Periodical tests expect regular hard work on the students' part and provide them motivation and encouragement for learning. They reduce the loss of time and energy of the students.

**(c) Progress reports:** A progress report is very important as it shows the progress of a student in his or her areas of study and various activities related to the curriculum or course. It is important due to the following reasons:

- It provides the students with a kind of motivation, satisfaction, and makes them aware about the level of their performance.
- It gives feedback to the students about their efforts in learning.
- It makes students aware about the weak areas so that they can work on them properly.
- Parents get an opportunity to be acquainted about the progress of their wards.
- With the help of a progress report, parents can arrange the necessary study support for their sons and daughters.
- The school administration gets to know about the performance of its students as well as its teachers in various subjects.
- Remedial classes may be arranged by the schools for weak students as per the records brought out by the progress report of the students.

**(d) Cumulative records:** A student's 'cumulative record' is the record of all the personal and social qualities, values, attitudes, co-curricular activities and his or her behaviour in the classroom. This kind of record helps in the overall development of a student.

The following are the important features of the cumulative records:

- A cumulative record helps in appreciation of each student's academic and behavioural performance in the class.
- After constant observation and complete evaluation, every student can be categorized into special groups in the classroom on the basis of his or her interests and abilities.
- Cumulative records can contain a wealth of information for teachers and other staff to help the students in implementing various effective instructions and strategies to support them in their academic and social development in and beyond the classroom.
- The record includes the recording of all the activities, special interests, hobbies, and personality traits of a student in a systematic order.
- It is important for teachers to have a complete understanding of the learning abilities of every student to maintain his or her cumulative record.
- It is an effective current and future guide in tracking the progress of a student as it serves as an additional information base for providing vocational and academic guidance to the student.
- Special areas of academic or behavioural weaknesses can be identified in the student's cumulative record and the teacher can design a programme to include corrective actions in order to minimize the various weaknesses.
- The cumulative record helps teachers to adopt different teaching methods or strategies according to the measured skill levels of students.

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- The cumulative record also helps teachers to adopt suitable, remedial teaching measures, and curriculum modification in addressing student's learning difficulties.
- A student's cumulative records can provide information for the effective execution of behaviour modification strategies in a class.

## 7.5 SUMMARY

- When used in the context of learning, measurement would refer to applying a standard scale or measuring device to an object, series of objects, events or conditions, according to practices accepted by those who are skilled in the use of the device or scale.
- Evaluation is an act or process that assigns 'value' to a measure. When we are evaluating, we are making a judgment as to the suitability, desirability or value of a thing. In the teaching-learning situation, evaluation is a continuous process and is concerned with more than the formal academic achievement of students.
- In order to know how far the students have previous learning, to get the knowledge of the effectiveness of instructional objectives, and to diagnose the problems on the way of achievement of students, the teachers use four types of evaluation.
- Choice Based Credit System (CBCS) is the system which is implemented in most of the universities of North America and Europe, is considered a fundamental tool for transforming the orthodox and outdated system of higher education in India. CBCS functions on a modular pattern based on module/units called 'credits'.
- The term Continuous and Comprehensive Evaluation (CCE) refers to the two important and essential conditions of evaluation. These are: (i) continuous evaluation and (ii) comprehensive evaluation. The meaning of continuous evaluation is that the evaluation of learners at levels of schools should be done on continuous basis, i.e., throughout the year or session, rather than only at the end of a session, course or class.
- The other aspect is comprehensive evaluation which means that the evaluation process should cover all aspects of personality development of the students, i.e., scholastic as well as non-scholastic areas.

## 7.6 KEY TERMS

- **Quantification:** It indicates to what extent a particular attribute is present in a particular object.
- **Reliability:** It refers to the consistency of a measuring instrument.
- **Psychomotor:** It relates to the origination of movement in conscious mental activity.
- **Periodical tests:** These are the tests that are conducted on regular intervals in the classes or labs.

## Check Your Progress

6. What led to colleges becoming autonomous in 1978?
7. Define continuous evaluation.
8. Who wrote the book *Comprehensive Evaluation in Schools*?
9. How are cumulative records helpful?

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## 7.7 ANSWERS TO 'CHECK YOUR PROGRESS'

1. Physical measurement is the measurement of the object which has absolute existence. For example, we measure height of individuals, the weight of rice, etc. Here, we directly measure the height or weight of an individual and all the measuring tools of physical measurement start from zero. Physical measurement is always accurate and quantitative, and there are some set of tools for physical measurement all over the world.
2. The application of the principles of measurement in the field of education is known as educational measurement.
3. To develop competency among the teachers in educational measurement, Ebel has suggested the following measures:
  - (a) Know how to interpret test scores correctly and fully, but with recognition of their limitations.
  - (b) Know how to select a standardized test that will be effective in a particular situation.
  - (c) Know how to plan a test and write the test questions, to be included in it.
  - (d) Know the educational uses as well as the limitations of educational tests.
4. Evaluation takes place with the help of test and measurement. In the classroom situation, the teachers first use classroom tests to evaluate the students according to their different traits. After getting the answer papers, the teachers now provide some numerals to the answer papers, this step is known as measurement. After the measurement step, now the teachers arrange the students as first, second, third etc., according to their achievements. This step is evaluation.
5. The steps involved in an evaluation process take place in a hierarchy. These steps are:
  - (a) Evaluating
  - (b) Planning of appropriate learning experiences
  - (c) Selecting appropriate teaching points
  - (d) Specification of desired student behaviour
  - (e) Identification and definition of specific objectives
  - (f) Identification and definition of general objectives
6. The Kothari Commission report in 1966 and an ensued debate on college autonomy lead to a few colleges becoming autonomous in 1978.
7. The meaning of 'continuous evaluation' is that the evaluation of learners at levels of schools should be done on a continuous basis that is, throughout the year or session rather than only at the end of a session, course, or class.
8. H. S. Srivastava, ex-professor and head of NCERT's department of educational measurement and evaluation, is the author of *Comprehensive Evaluation in Schools*.
9. A student's 'cumulative record' is the record of all the personal and social qualities, values, attitudes, co-curricular activities and his or her behaviour in the classroom. This kind of record helps in the overall development of a student.



## 7.8 QUESTIONS AND EXERCISES

### Short-Answer Questions

1. Give the various definitions of measurement.
2. Write a short note on the concept of evaluation.
3. List the importance of a progress report.

### Long-Answer Questions

1. Explain the characteristics of good measurement tool.
2. Discuss the types of educational procedures.
3. Evaluate the concept and importance of assignments in evaluating a student.

## 7.9 FURTHER READING

- Linn, R.L. and Gronlund, N.E. 2005. *Measurement and Assessment in Teaching*, 8th edition. New Delhi: Pearson Education Pvt. Ltd.
- Singh, Raj. 1994. *Techniques of Measurement and Evaluation*, 1st edition. New Delhi: Commonwealth Publishers.
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- Annastasi, A. 1976. *Psychological Testing*, 4th Ed. New York: McMillan Publishing Co.
- Block, J. H and Anderson, L. W. 1975. *Mastery Learning in Classroom Instruction*. New York: McMillan Camp.
- Ebel, R.L. 1972. *Essentials of Educational Measurement*. New Jersey: Englewood Cliff.
- Grunlund, N. E. 1970. *Stating Behavioural Objectives for Classroom Instruction*. New York: McMillan.

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## UNIT 8 EDUCATIONAL OBJECTIVES OF TEACHING

NOTES

### Structure

- 8.0 Introduction
- 8.1 Unit Objectives
- 8.2 Teaching Objectives
- 8.3 General and Specific Objectives of Teaching
- 8.4 Cognitive, Affective and Psychomotor Objectives
  - 8.4.1 Taxonomy of Objectives in Cognitive Domain
  - 8.4.2 Taxonomy of Teaching Objectives in the Affective Domain
- 8.5 Summary
- 8.6 Key Terms
- 8.7 Answers to 'Check Your Progress'
- 8.8 Questions and Exercises
- 8.9 Further Reading

### 8.0 INTRODUCTION

The tasks and functions one performs in life are always aimed at the attainment of one or another objective. All life's tasks are guided by objectives. In accordance to the goal we want to achieve, we adopt suitable methods. The objectives are determined keeping in mind the limits of achieving them. The success of our life depends on objectives to a great extent. Due to this reason, educationists have imagined such a form of education by which maximum success in life can be attained. This success should not be limited to any specific field of life, but includes all fields. So, the primary objective of education is considered to be the all-round development of human life. There are different subjects under education. The teaching of different subjects has different objectives. In this unit, you will study the taxonomy of educational objectives. In addition to this, you will also study general and specific objectives of teaching along with cognitive, affective and psychomotor objectives.

### 8.1 UNIT OBJECTIVES

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

- Discuss the aims and objectives of teaching
- Discuss the different types of educational objectives
- Determine the criteria for teaching objectives at the school level
- Explain the taxonomy of educational objectives in cognitive, affective and psychomotor domains

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## 8.2 TEACHING OBJECTIVES

Teaching objectives are the basis and final aim of educational process. This objective is kept in view while constructing the curriculum and teaching methods. The characteristics of teaching objective are:

1. Provide direction
2. Help in curriculum construction
3. Plan teaching experiences
4. Provide basis for evaluation
5. Establish coordination among different factors of teaching

### Bases of Objectives Determination

- a. **Necessity of students:** Teaching objectives are determined according to the concepts about which qualities have to be developed in the students, which habits have to be formed in them, etc.
- b. **Necessity of society:** A child has to adjust in society. So suitable qualities should be developed in the child according to the need of society.
- c. **Nature of subject and development of knowledge:** The nature of the subject and the opinion of subject specialists are helpful in determining teaching objectives. The teaching points are determined on the basis of the objective to be achieved through the subject.

### Need for Educational Objectives

Teaching objectives are needed for the following causes:

1. Teaching objectives guide and direct.
2. They help in curriculum construction.
3. They help in planning the teaching experiences.
4. They provide a basis for evaluation.
5. They establish coordination among different levels.

### Teaching Objectives at the School Level

Like other subjects, the teaching of sciences is arranged in schools with the objective of optimum behavioural changes with a view to their development and progress. These behavioural changes are brought about in all three aspects—cognitive, affective and conative (psychophysical).

While determining the objectives of teaching, the desirable changes have to be analyzed as related to the three aspects of behaviour, which can be attained by the teaching of any subject. When we analyze the teaching objectives in relation to the behavioural changes, we also classify them into certain groups, as cognitive, affective, experimental, skill-related, interest, viewpoint and aesthetic objectives. The determination of teaching objectives at the school level is generally done as follows:

1. **Knowledge or cognitive objectives:** By the study of science, the students gain knowledge about their terms, facts, concepts, definitions, laws, theories and processes.

The students have to attain the knowledge of the following:

- a. Technical terminology and knowledge of the facts of sciences
- b. The knowledge of fundamental theories and processes of sciences
- c. The knowledge of natural processes
- d. The knowledge and mutual dependence of animals and plants
- e. The knowledge of biology and its similarity to the functional system of human body

2. **Understanding or affective objectives:** By the study of sciences, the students understand the knowledge they have gained about the related terms, facts, concepts, definitions, laws, theories and process.

Different biological facts are mutually related. On the basis of the available facts, the students generalize and propound theories, such as:

- a. Plants make food in the presence of carbon dioxide gas, water, light and chlorophyll
- b. There are several similarities among animals and plants of different species
- c. Plants release oxygen gas into the atmosphere by the photosynthesis process

3. **Application or conative objectives:** Having attained knowledge of sciences, the students use the knowledge of related facts, laws, theories and process and their understanding in the following things:

- a. In day-to-day activities
- b. In acquiring related experiences in other fields and professions
- c. In gaining higher knowledge and understanding in biological sciences
- d. In confronting new and unknown situations/problems on the basis of old and known ones

4. **Skill objectives:** In modern times, the teaching of biological sciences is chiefly aimed at developing different skills in the students by which they can resolve the problems in their daily lives. Different skills are as follows:

- a. Solving problems
- b. Learning skills for use of terms of scientific methods
- c. Attainment of ability of generalization on the basis of different facts.
- d. Attainment of skill in observation
- e. Attainment of skill in experiments for the verification of different facts
- f. Attainment of skill for drawing diagrams

5. **Development of various abilities:** Ability to identify different animals and plants and their classification, ability to dissect different animals and plants, ability to plant home garden, etc.

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By the study of biological sciences, the students will be able to acquire the following types of skills and proficiencies:

- a. **Manipulative skills:** They acquire manipulative skills. The students acquire capability and ability related to different types of practical, action-oriented and project-related task and tools.
  - b. **Diagram:** The students acquire different skills related to designing of different types of diagrams, figures, shapes, copies, graphs, etc.
  - c. **Inference:** The students acquire the ability to draw suitable inferences and generalize from different types of experiments and testing.
  - d. **Minute observations:** The students acquire different skills related to dissection and minute observation, such as:
    - i. Selection of specimens for dissection or minute observation
    - ii. Fixing of specimens for definite objective
    - iii. Selection and skilful use of suitable tools for dissection or minute observation of selected specimens
    - iv. Separation of parts or limbs without causing any damage to the specimens for study
    - v. Display of the parts of specimens cleanly and suitably for demonstration
    - vi. Maintaining record of the facts gathered from the dissection and observation, and draw inferences and generalize
  - e. **Gathering:** They acquire ability to gather and safe-keep the genetic materials of different types.
  - f. **Mathematical skill:** They acquire the mathematical skills for resolving numerical problems related to biological sciences.
6. **Objectives related to interest:** The study of sciences beget in the students respect for the biological word. This study enables the students to develop attraction and interests in them. Their interest in the type of the biological world can be measured from the following types of behaviours:
- a. To take interest in books and literature related to biological sciences.
  - b. To ask questions during teaching and related discussions of biological sciences
  - c. To cooperate suitably in the setting up of aquariums, and like projects
  - d. To cooperate in the setting up of biological science gardens or parks
  - e. To attempt to know about the biologists and their contribution, and to study the literature related to it
  - f. To show an interest in tourism related to biological sciences so that practical knowledge can be acquired
  - g. To display interest in the collection, preservation and maintenance of study material related to biological sciences
  - h. To take interest in performing different hobbies as related to biological sciences
- Development in scientific interest provides assistance in the following activates:
- a. Study of literature and articles related to biological sciences
  - b. Love for nature

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- c. Observation of animals and plants
  - d. Study of life sketches of biologists and scientific discoveries
  - e. Organization of biological clubs, scientific fairs, different programmes on different problems, etc.
7. **Attitude or aptitude objectives:** The study of science assists in the development of the following types of aptitudes in the students:
- a. Adoption of a positive attitude toward the study and use of biological sciences
  - b. Development of scientific attitude and aptitude for acquiring knowledge and skills in order to face the realities of life
- A student armed with scientific attitude has the qualities of curiosity, truthfulness, change of prejudices on the basis of available results, not being orthodox, objectivity, etc. it is possible to make efforts for the development of these qualities continuously.
8. **Appreciation objectives:** The study of biological sciences encourages the production of aesthetic and encouraging feelings in the students. The evidence of this can be got from the behavioural display of the students of the following types:
- a. To admire the contribution of biological sciences in the progress and development of the individual and society
  - b. To admire the great inventions and discoveries and related contributions done by biologists
  - c. To admire the role of biological sciences in making the human life healthy and happy
  - d. To acquire and admire the knowledge of the following types:
    - i. Mutual dependence between the plant and animal world and admire them
    - ii. Functioning of nature
    - iii. Balance present among different components of nature
    - iv. Micro-organism and their significance in our life

**Determining Teaching Objectives**

Generally the following norms which are illustrated in Figure 8.1, should be adopted for the determination of teaching objectives:

1. **Usefulness:** The teaching objectives should be such as to be useful for the present and future life of students.
2. **Contemporariness:** The teaching objectives should not be based upon past knowledge and beliefs, but on the contemporary values and needs.
3. **Suitability/fitness:** The teaching objectives should be in proper sequence.
4. **Appropriateness:** The determination following teaching objectives should be in conformity with the level, need and maturity of the students.
5. **Practicability:** The teaching objectives should be such so as to make necessary experiences attainable and possible.

Besides the above, some other norms are as follows:

- a. Educational philosophy
- b. Educational psychology

- c. Need of the student
- d. Need of the society
- e. Nature of the subject matter

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It is evident from the above discussion that the teaching objectives of biological sciences should be based on social, psychological and philosophical background.

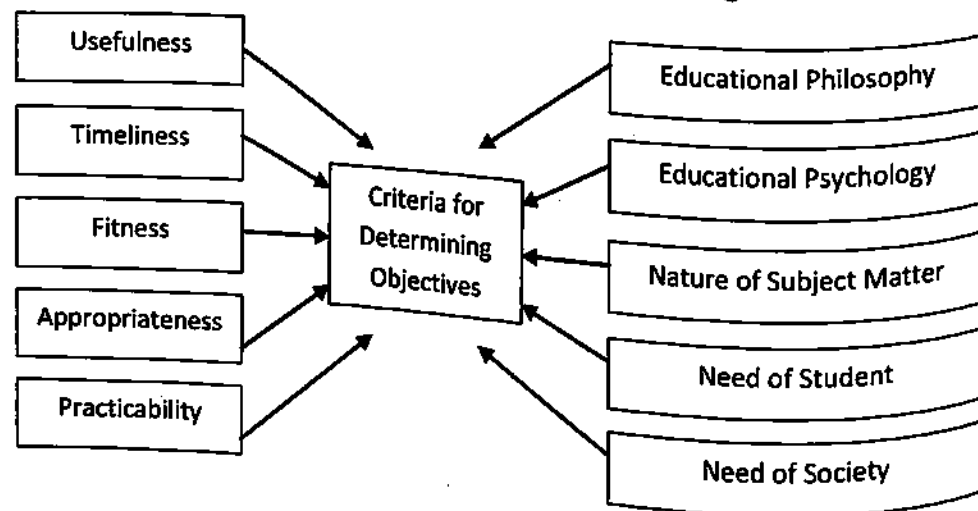


Fig. 8.1 Criteria for Determining Objectives

### 8.3 GENERAL AND SPECIFIC OBJECTIVES OF TEACHING

Taxonomy means, 'a system of classification' and in this sense taxonomy presents a system of classification of the objectives in similar way as Dewey's decimal system tends to classify a number of books in a library. By 'taxonomy' is meant a method or system of classification. Dewey is given the credit of classifying different books and scriptures of library with the decimal system.

In the same way, Dr. Benjamin S. Bloom (of Chicago University) is given the credit of categorizing the teaching objectives into the cognitive aspect in 1956. Bloom's taxonomy first appeared in 1956 when Benjamin Bloom, an educational psychologist, presented the model in *Taxonomy of Educational Objectives*. He provided a basis to educational evaluation and curriculum change.

Krathwohl and Masia analyzed the affective aspect of teaching objectives in 1964. In India, the Bloom taxonomy was taken as the basis for presenting the enriched form of teaching objectives by the Regional College of Education, Mysore, which is called the RCEM System. Bloom's Taxonomy, although rooted in education, is also useful in a business context, in that it helps you assess how much training and coaching people need to perform effectively in their roles.

Bloom has classified the teaching objectives on this basis that the teaching-learning process is an attempt to bring about a behavioural change in the students with the help of textbook or learning experiences. Several attempts were made for classification of teaching objectives or formulation of taxonomy of instructional objectives, as a result of which they were classified into two classes:

**Check Your Progress**

1. What do you mean by teaching objectives?
2. What are the causes or need of teaching objectives?
3. Name the different domains of teaching objectives.
4. Name any five norms which should be adopted for the determination of teaching objectives.

1. **General objectives:** A general objective is one which is related completely to the teaching process. For example, problem-solving in mathematics, critical thinking and creativity.
2. **Specific objectives:** Generally, the specific objectives are limited to the concepts and theories of subject matter, for example, area, ratio, Pythagoras calculation, etc.

**NOTES**

The teachers have approved of general objectives as desirable aims, but their vagueness has not provided much help in their use in teaching. In order to do away with this shortcoming, a group of psychologists, in 1948, made an attempt to classify similar factors of human behaviour.

This group constructed a taxonomy the basis of which was 'from concrete to abstract' and 'from simple to complex'. The taxonomy of educational objectives has been worked out on the assumption that the teaching-learning process may be conceived as an attempt to change the behaviour of the pupils with respect to some subject matter or learning experiences. Behaviour is divided into three domains - cognitive, affective or psychomotor. The taxonomy of educational and instructional objectives has also been considered to be belonging to three domains mentioned below:

- Activities related to head - cognitive domain
  - Activates related to heart - affective domain
  - Activates related to hand - psycho-motor domain
- a. First, classification of the cognitive aspect was presented by Bloom and others in 1956.
  - b. Secondly, the classification of the affective aspect was done by Bloom and his associates Krathwohl and Masia in 1964.
  - c. Thirdly, the classification of the psychomotor aspect was presented by Simpson in 1966 and Harrow in 1992.

Below we find the classification of all aspects in brief.

- a. **Cognitive domain:** This aspect includes objectives related to thinking, knowing and problem-solving. According to B.S. Bloom, memorizing or identifying knowledge and development of mental abilities and skills are included in the cognitive domain.

There are six chief classes in the cognitive aspect:

- (i) Knowledge
- (ii) Comprehension
- (iii) Application
- (iv) Analysis
- (v) Synthesis
- (vi) Evaluation

- b. **Affective domain:** This aspect is related to aptitude, values, interests and aesthetic sense.

In the affective domain are included the educational objectives of interest, aptitude, change in value, development of aesthetic sense and coordination. This aspect has been classified into the following five classes:

- (i) Receiving
- (ii) Responding



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- (iii) Valuing
- (iv) Organization
- (v) Characterization by a value or value condition

**c. Psycho-motor domain:** In this aspect are included the teaching objectives related to manual and motor skills. Simpson and Kibler have attempted to classify the objectives of psycho-motor domain. According to Dr. R.H. Dubey, the following are the objectives of this field:

- (i) Initiation
- (ii) Manipulation
- (iii) Precision
- (iv) Articulation
- (v) Naturalization

Taking these three aspects as the basis, Bloom and his associates classified the teaching objectives and allotted six objectives for each of them.

RCEM System (Regional College of Education, Mysore) has considered analysis, synthesis and evaluation to be under creativity which is a chief objective.

The teachers generally need only focus on the cognitive domain in the determination of teaching objectives. The cognitive aspect has been well classified. Table 8.1 describes the three domains of taxonomy of educational objectives.

Table 8.1 Three Domains of the Taxonomy of Educational Objectives

Cognitive Domain B.S. Bloom, 1956	Affective Domain Bloom, Krathwohl, Massiah, 1964	Psycho-motor Domain Simpson, 1969
It is related to the gathering of information.	It is related to the heart and internal feelings and experiences.	It is related to practical work and exercise.
1. Knowledge	1. Receiving	1. Impulsion
2. Understanding	2. Responding	2. Manipulation
3. Application	3. Valuing	3. Control
4. Analysis	4. Considering	4. Coordination
5. Synthesis	5. Organization	5. Naturalization
6. Evaluation	6. Characterization	6. Habit formation

### 8.4 COGNITIVE, AFFECTIVE AND PSYCHOMOTOR OBJECTIVES

It is essential to write the teaching objectives in their practical form in order to make the learning experiences comprehensible and make evaluation definite. The practical form of objectives makes the teaching process orderly and organized. It helps the teacher in the selection of the teaching method, strategy and audio-visual aids.

**Check Your Progress**

- 5. What is the name of Bloom's book on taxonomy?
- 6. On what basis has Bloom classified teaching objectives?
- 7. What are the three domains of behaviour?

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Different psychologists have done commendable work in this field. The efforts of Bloom, Robert Mager and Robert Miller have been significant.

**1. B.S. Bloom theory (Bloom's taxonomy):** Bloom and his associates have done important work in the direction of determination of teaching objectives. Bloom has clarified objectives from the evolution viewpoint. He has clarified that from the evaluation viewpoint, the construction of achievement tests should take into consideration the measurement and evaluation of different educational objectives in place of subject matter.

Bloom emphasized not to make the achievement test subject matter centred, but objective centred. He stressed that each and every question should be related to the evaluation of one or the other teaching objective. For it, he attempted to write the teaching objectives in a practical form. Bloom has classified all teaching objectives into three chief parts:

- a. Cognitive objectives
- b. Affective objectives
- c. Psychomotor objectives

Bloom and his associates classified cognitive and affective objectives from a lower to higher level classifying them into six subparts. They did not present any plan for the writing of psychomotor objectives.

Whenever we learn something new, we start at the lowest level of understanding. The more we learn about the subject, the more we 'move up' to the next level in skill and complexity, and the more we're able to do with this information. At the start, we simply know about a topic – but when we reach the highest levels of understanding, we're able to make educated judgments and form well-rounded arguments to support our theories.

This can be neatly summarized in a pyramid diagram as shown in Figure 8.2. Here, the most basic levels of understanding are wider than the higher levels, because many more people will have basic knowledge of a subject than have higher-level knowledge.

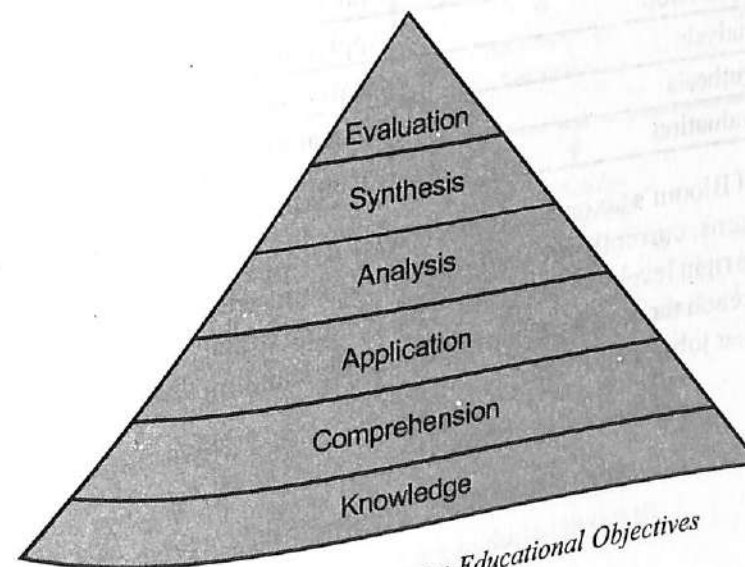


Fig. 8.2 Bloom's Taxonomy on Educational Objectives

The six levels of Bloom's taxonomy relate to 'cognitive' functions – i.e. functions associated with knowledge, comprehension and application. Let's look at each level in greater detail, starting at the lowest:

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- i. **Knowledge:** This is learning on its most basic level. People at this level can remember specifics such as terminology and dates, and they can remember facts and figures to answer basic questions. The knowledge objectives mainly call for the recall and recognition level of one's memory and therefore their evaluation is primarily made through a simple recall or multiple choice type questions.
- ii. **Comprehension:** Comprehension means that individuals can derive meaning from their knowledge by organizing, comparing, and interpreting the information.
- iii. **Application:** When people can apply their knowledge, they can use the information in a new or different way to solve problems.
- iv. **Analysis:** At this level, individuals can break the information down into parts, and then examine those parts individually. The team can see how each piece relates to the whole, understanding things like cause and effect as well as relationships.
- v. **Synthesis:** Synthesis means that people can make educated judgments about the information, and they can propose new solutions.
- vi. **Evaluation:** This last level means that individuals can put together all of the elements to form a whole.

The pyramid representation is a later interpretation of Bloom's work, developed by Lorin Anderson, a former student of Bloom. Anderson worked with a group of educators and psychologists to update the taxonomy. Published in 2000 as *A Taxonomy for Learning, Teaching, and Assessing*, the other big difference was that they changed the name for each level from a noun to a verb (see Table 8.2).

Table 8.2 Comparison between Bloom's Original and Anderson's Revised Work

Blooms Original Level	Revised Level
Knowledge	Remembering
Comprehension	Understanding
Application	Applying
Analysis	Analyzing
Synthesis	Evaluating
Evaluation	Creating

The benefit of Bloom's taxonomy is that it helps us identify where we, and individuals within our teams, currently are on the pyramid. Thus, we can ensure that people are learning at the right level. We can also use the pyramid to help guide our people through the levels to reach the levels of learning and understanding that they need to reach in order to do their jobs effectively.

On the basis of Bloom's taxonomy, Table 8.3 gives a brief description of objectives pertaining to cognitive and affective aspects.

Table 8.3 Cognitive Objectives

Class	Achievement
Knowledge	Fact, terminology, theory, tradition, order, result, norm, method, class, standard, generalization, etc.
Understanding	Understanding without any material (generalization theory construction)
Application	Use of generalization in other situations
Analysis	Classify material into sub-parts. Analysis of facts, relationship and organizational theories.
Synthesis	Form a new structure. Transfer resources and acquiring of feelings.
Evaluation	Evaluation of material with specific objectives, and their field (internal means and external norms)

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8.4.1 Taxonomy of Objectives in Cognitive Domain

Let us analyse the taxonomy of objectives in cognitive domain.

1. **Knowledge (the lowest level):** Knowledge functions at the memory level of teaching. It is related with the pre-learning material. Under it are included two mental activities-recall and recognition-of a pre-learning material from one fact to the whole theory.

The classification of knowledge is given Figure 8.3.

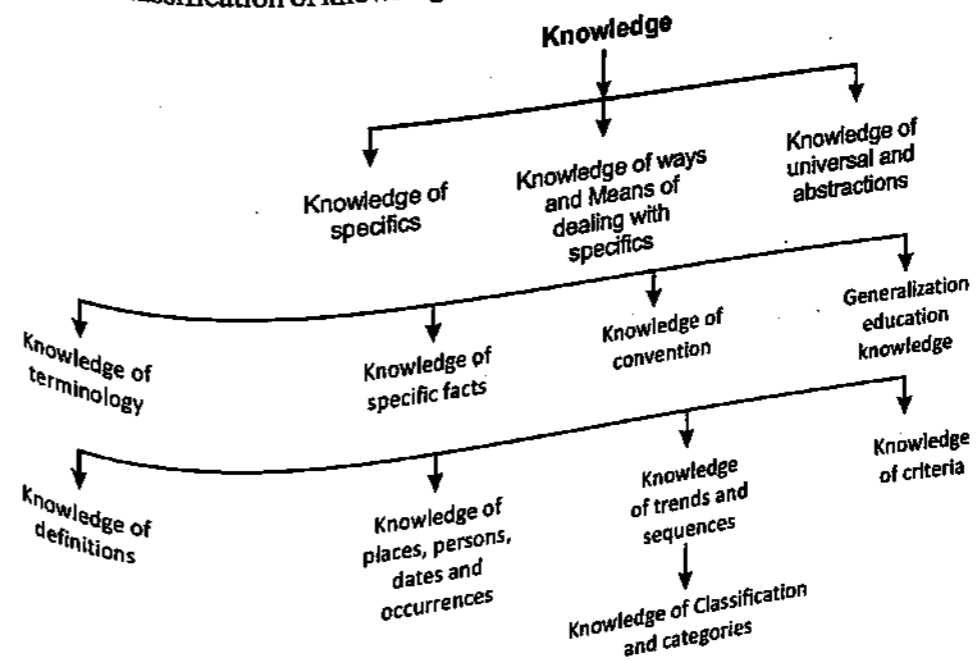


Fig. 8.3 Classification of Knowledge

Thus, under cognitive aspect, the following knowledge is imparted:

- (a) **Knowledge of specifics:** The following are included under it:
  - i. Knowledge of terminology
  - ii. Knowledge of specific facts

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**(b) Knowledge of ways and means of dealing with specifics:** The following come under this:

- i. Knowledge of conventions
- ii. Knowledge of trends and sequences
- iii. Knowledge of classification and categories
- iv. Knowledge of criteria
- v. Knowledge of methodology

**(c) Knowledge of universals and abstractions in a field of learning:** The following comes under this:

- i. Knowledge of principles and generalizations

Thus, we see that under this objective, the students gain knowledge about the facts, principles, relationships, ideas, processes, axioms, postulates, definitions, hypotheses and historical order of subject matter, etc.

**2. Comprehension (the second low level after knowledge):** The capacity to understand the meaning of a thing is called comprehension. It includes the following:

- a. Acquiring communication correctly.
- b. Changing it from one form to another and re-organising in without change in its central concept.

It can be clarified into three stages as shown in Table 8.4.

Table 8.4 Stages of Comprehension

Translation			Interpretation	Extrapolation
Of the concrete from one form to another.	Of the abstract from one level to another.	Of the oral from one form to another.		
			For testing of comprehension.	It includes all levels from the presentation of the problem to its solution

**3. Application (the third low level):** This objective, as illustrated in Figure 8.4, can be attained after having attained the objectives of knowledge and comprehension. Development of using the knowledge imparted to the students under new circumstances

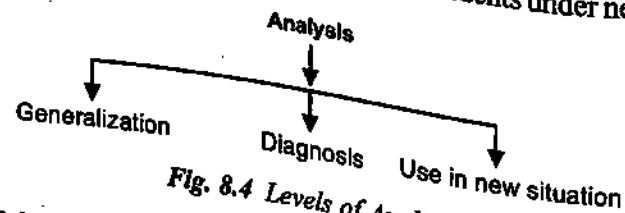


Fig. 8.4 Levels of Application

**4. Analysis (high level):** This objective can be attained after the above three objectives. The whole subject matter is divided into its inherent parts to establish their mutual relationship. It also has three levels as shown in Figure 8.5.

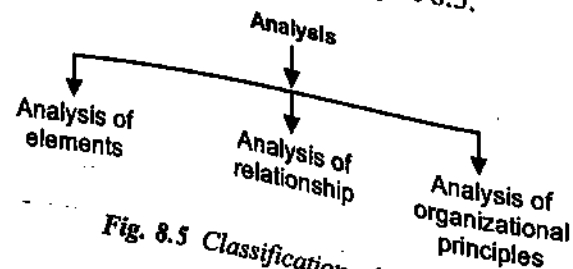


Fig. 8.5 Classification of Analysis

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**5. Synthesis (higher level):** This indicates the capacity of forming new wholes after having gathered different facts. It also includes the origin of unique coordination. It also has three levels as can be seen in Figure 8.6:

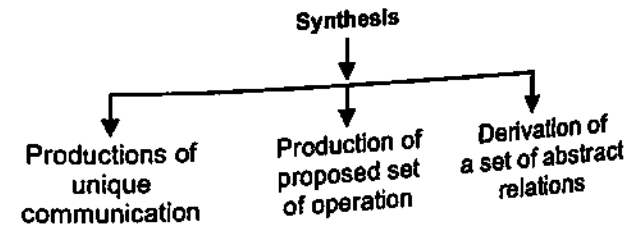


Fig. 8.6 Levels of Synthesis

**6. Evaluation (highest level):** Under it a critical attitude is adopted towards a thing, incident, fact, etc. to take a decision regarding its benefits and usefulness. It is under a norm or standard in order to know the purity, effect and satisfaction of capacity of a thing. This inference can be qualitative or quantitative.

The following are included under it:

- a. Judgmental terms of internal evidence
- b. Judgment in terms of external criteria

**Taxonomy of cognitive domain as presented by bloom-classification**

We can clarify the above classification of Bloom regarding the cognitive aspect:

**1. Knowledge:** The following are included under knowledge:

- a. Attempt to develop recognition and recall of specific facts terms, conventions, use, criteria, methods, classes, laws principles, generalizations and structures of subject matter to the students.
- b. To create proper circumstances in the classroom.

**2. Comprehension:** The following are included under it:

- a. Comprehension of the facts, terms, classes, conventions, law, etc. included under the cognitive aspect so that the students are able to translate the acquired knowledge into their own words
- b. The students are able to interpret and extrapolate.

**3. Application:** This task is possible only after knowledge and comprehension of a thing:

- a. Generalise the facts, laws and principles related to the thing
- b. Diagnose its weaknesses or shortcomings
- c. Use the subject matter

Only under this situation, would the students be able to use that knowledge in their individual circumstances as per their ability. Thus, knowledge and comprehension function as the basis for application.

**4. Analysis:** The students perform the following tasks under this:

- a. Analysis of facts, laws, principles, etc
- b. Analyze their relationships
- c. Analyze them into organized principles

It is clear that the above objectives of knowledge, comprehension and application are necessary for separating and establishing their mutual relationship.

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5. **Synthesis:** The students attain this ability after having obtained the objectives of the above four classes, by which they are in the position to form a new concept, plan or draft on the basis of the learned subject matter for its facts, laws and principles.
6. **Evaluation:** The basis of teaching work is the ability of students to take decision whether the learning that they have acquired is useful or useless from the viewpoint of value. Thus, it is clear that a decision-making plan is developed on the basis of evidence and external as related to facts, to facts, principles and laws.

It is clear from the above discussion that an effort should be made to develop the cognitive aspect with the help of facts, principles, etc. for objectives from knowledge to evaluation.

**8.4.2 Taxonomy of Teaching Objectives in the Affective Domain**

Bloom and his associates (Krathwohl and Maria, 1964) presented the classification of objectives of the affective domain from a lower level to a higher level. For it, they made development of interest, aptitude, value aestheticism and coordination. It is a difficult task to give a description of the behaviours of this aspect. They are generally not much used in the mathematics subject.

1. **Receiving or attending:** Receiving is the desire to receive something or sensitivity towards a stimulus. It has three levels as shown in Figure 8.7.

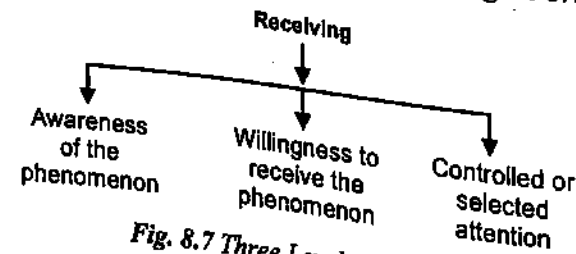


Fig. 8.7 Three Levels of Receiving

2. **Responding:** Active expression towards a stimulus is responding. It is somewhat similar to interest. It has the levels as shown in Figure 8.8.

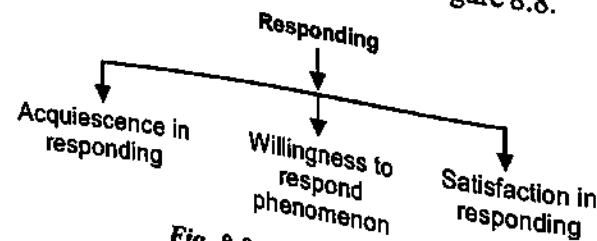


Fig. 8.8 Levels of Responding

3. **Valuing:** It includes student's behaviour by which he expresses his feelings towards an object, fact, incident, good behaviour, values and qualities. It is related with dedication to values. So it includes approval, favourableness and loyalty towards specific values. Naturally it has three steps as shown in Figure 8.9.

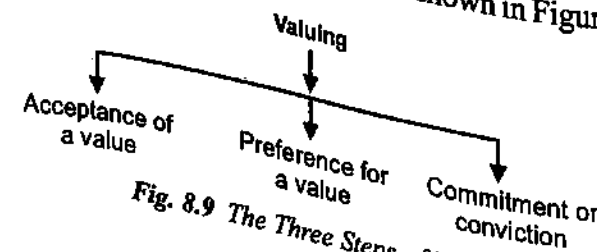


Fig. 8.9 The Three Steps of Valuing

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4. **Conceptualization:** The basis of construction of concepts or thinking is similarity or dissimilarity. When the students construct concepts on the basis of similarity, difference and relationship in the above constructed values. Their behaviour is included under this objective. Due to the diversity of values, the concept formation for problem-solving is included under it.
5. **Organization:** Orderly adjustment of selected values for concept formation is included under it. Organization is the construction of value norms after having ordered the constructed concepts on the basis of suitable selected values. It has the following steps under it:
  - a. Conceptualization of a value
  - b. Organization of a value system
6. **Characterization:** Specification of controlled values, concepts and loyalties in the relation to human behaviour are included under it. It includes the behaviour of the students by which they constructed value norms. It has the following steps under it:
  - a. Generalized set
  - b. Characterization

Thus, we see that Bloom and his associates have classified the educational objectives of affective domain into five classes, which has been clarified in Table 8.5.

Table 8.5 Affective Objectives

Class	Achievement
Receiving	Awaking, desire, controlled attention
Responding	Approval of response, satisfaction and desire
Valuing	Approval, favourableness and organization in value condition
Organization	Conception of value and organization of value system
Characterization of value complex	General group, specification

They are analyzed as follows:

1. **Receiving or attending:** This process is as follows:
    - a. The human values have to be experienced first from the viewpoint of affective development
    - b. One of the other types of stimulus needs to be experienced
    - c. It is necessary for the students to be attracted to this stimulus
    - d. The students must have the desire to respond to it
- The teacher's functions in this regard are as follows:
- To attract the students towards the presented subject matter sufficiently



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- To motivate the students in a manner that the students are sufficiently motivated to receiving human values
- The condition of arousal of desire and attention should last for a suitable time and suitable effort should be made toward it

**2. Responding:** The relationship of the second level of affective development is with the proper response of the students. The above mentioned level functions as the basis of receiving for this class. The response made by the students is identified from the following situation:

- When the students have sufficiently aroused the desire to receive the value properly
- When they start to take part in the educational activities with interest

The following functions must be performed in order to make responding proper:

- The students must be prepared for responding
- Desire should be aroused in them for responding
- In order to let the students feel sufficient satisfaction in responding, necessary efforts should be made in this direction.

It is clear from the above discussion that this class helps the students in the development of self-expression, self-development and the satisfaction derived from it.

**3. Valuing:** The activities of this class are based on the activities of the two classes and their result. After having attracted a student towards an object or concept to make him respond to it; the value of the object or concept is as much as the students think sufficient or the concept is also evaluated.

Thus the concerned behaviour of the students is affected by the viewpoint of realization of the individual and social values. At this level, the teacher makes planned efforts to make the students receive and follow it.

**4. Organization:** The student, while keeping in view the value of object or concept, learn to make responses as related to his behaviour, also receives individual or social values. Sometimes it appears that the values are mutually contradictory. In the above situation, there are two necessities:

- First, to prevent their confrontation
- Second, to impart knowledge about the form and concept of values for being received well

After this knowledge, they are systematized and organized. For it, the teacher ought to make efforts in the following direction:

- To suitably coordinate, keeping in view the individual and social welfare of different values, that are the social values realizes while being in conformity with individual welfare.
- Having understood the mutual relationship of values, organize them into such a system by which the strong character of the students is formed.

It is clear that the achievement of this level is possible only after the achievement of the above three objectives.

**5. Characterization of value complex:** By this level of affective domain development the objectives of the prior four classes have been achieved. Having

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reached this level, the student has formed a specific value system or character that has originated from the coordination of the student's individual and social values. Now, the role of that value system or character is attempted to give a specific form.

This character related level is extremely important. This level is permanent and an individual form on the basis of which the personality of an individual is identified. Thus, the individual assimilates different values within himself to achieve a high level of affective development. This is the reason that characterization or specification is considered to be the highest among all objectives of the affective domain.

**Taxonomy of Teaching Objectives in Conative or Psychomotor Domain**

It is essential that conative or psychomotor development should be effected by the students for their suitable adjustment in the biological and social environment.

The first attempt to classify the objectives of the conative or psychomotor domain was made by Simpson (1966). Later, Harrow (1972) developed it. Harrow has classified these objectives into the following six classes:

**1. Reflex movements:** This is the low level of psychomotor domain of behaviour. These activities start to occur by themselves in this domain of behaviour when they come into contact with an object. This is because these activities are guided and controlled by the automatic nervous system and brain. These activities do not stop developing from birth to death. Life is impossible in their absence, e.g., when a person's hand is pressed he draws his hand back. Thus, the basis of all human activities are these reflex movements.

**2. Basic body movements:** On the basis of the reflex movements of the first class, the child develops natural, basic body movements. When a child is instructed, he starts to make body movement accordingly: for example, jumping or running. He cannot control these movements for a long time. It is essential to train an individual for him to have strong and energetic body movements in the future.

**3. Physical abilities:** Physical abilities are developed from proper body movements. Body ability helps in body movement. So the purpose of this class is to make attempts to bring about maturity and develop ability and strength for body movements. With the help of ability and strength, the child is able to face different problems of life beside adjust with the environment. So it is essential that the child is trained in physical activities.

**4. Perceptual abilities:** The above muscular and body activates function as the basis of attaining these abilities. The perceptual ability of a child depends on the coordination of his body and sense organs. The child tries to acquire these abilities voluntarily. The significance of these skills is inherent in the fact that the child learns the following abilities through them:

- While identifying and understanding the present stimuli in the environment, to succeed in making adjustments to them.
- To gain ability to distinguish on the basis of knowledge acquired by the five sense organs; for example, to identify and distinguish by touching, by seeing,



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by hearing or by smelling. These abilities are immensely important. They help in the development of higher muscular activities with the passage of time.

**5. Skilful movements:** On the basis of the acquired abilities and activates under the above four classes, the skilful body movements develop. For it, the child has to be trained. In that situation, he can perform complex body movements. The following are the levels of learning it:

- First, he has to knowingly learn or make efforts to learn these activities.
- Secondly, he has to practice them.
- Thirdly, the child is able to display these activities skilfully without any specific effort after having been trained in them.

For example, the skill to dissect the genetic specimens, their minute observation, etc.

**6. Non-verbal communication:** Non-verbal communication is behaviour by which a student is able to skilfully express is meant that behaviour by which a student is able to skilfully express himself without the use of words.

Psycho-muscular activities provide the necessary basis for this function. Thus, after the student has acquired complete proficiency, he becomes able to communicate by the use of normal face expressions and acting.

It includes different types of skills. It begins with mental perception to include skills of complex overt behaviour. It is because no skill is possible without the coordination of mind and body. This is the reason that it is called psychomotor.

Psycho = mind

Motor = muscle

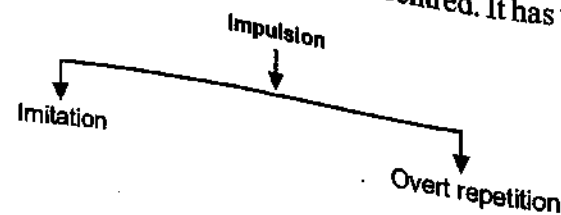
Generally the following skills are included in the teaching of biological sciences:

- Drawing skill
- Computation skill
- Construction skill
- Observational skill
- Problem-solving skill
- Dissection skill

**Stages**

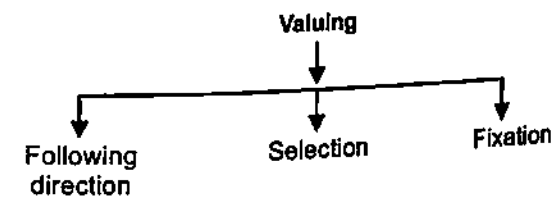
The following are the stages in the classification of the psychomotor domain:

- Impulsion:** This is the first step and is need-centred. It has two levels:

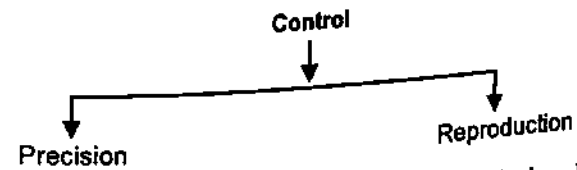


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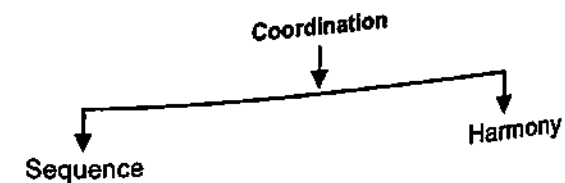
- Manipulation:** It includes the ordering of different factors inherent in a skill. It has three levels:



- Control:** It includes the relative corresponding weightage of the included factors. It has two levels:



- Coordination:** Coordination is the mutual inter-relationship, which is of the following types:



E.J. Simpson has described the following

- Perception
- Set
- Guided response
- Mechanism
- Complex over response

**Bases for development of learning experiences**

The following are the chief bases of developing learning experiences:

- Identifying terminal behaviours:** For evidence, collection of achievement of objectives, the terminal behaviours should be identified first to give them a specific form.
- Clear definitions:** The desirable behaviour should be clearly defined so that vague and misleading terminology is not used.
- Circumstances:** The circumstance should be identified for achievement.
- Knowledge of change:** The standards should be specified and compared in order to know the change.

**Action Verbs**

To write the objective practically, the action verbs are used (see Table 8.6). B.S. Bloom and the RCEM system have named them as mental abilities or specifications.

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Table 8.6 Action Verbs

Objective	Action Verbs
<b>Knowledge</b>	<b>Cognitive domain</b> (a) To recall (b) To recognize (c) To define (d) To state (e) To write (f) To list (g) To select
<b>Understanding</b>	(a) To explain (b) To indicate (c) To formulate (d) To present (e) To judge (f) To classify (g) To select (h) To translate
<b>Application</b>	(a) To compute (b) To assess (c) To demonstrate (d) To construct (e) To use (f) To predict
<b>Analysis</b>	(a) To divide (b) To conclude (c) To discriminate (d) To separate (e) To justify
<b>Synthesis</b>	(a) To argue (b) To discuss (c) To generalize (d) To summarize (e) To establish relationship
<b>Evaluation</b>	(a) To decide (b) To identify (c) To criticize (d) To defend (e) To avoid (f) To detect error

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<b>Receiving</b>	<b>Affective Domain</b> (a) To listen (b) To accept (c) To perceive (d) To prefer
<b>Responding</b>	(a) To answer (b) To develop (c) To list (d) To select
<b>Valuing</b>	(a) To accept (b) To influence (c) To participate (d) To recognize (e) To indicate (f) To decide (g) To increase
<b>Conceptualization</b>	(a) To differentiate (b) To relate (c) To demonstrate (d) To analyze (e) To compare
<b>Organization</b>	(a) To correlate (b) To judge (c) To determine (d) To form
<b>Characterization</b>	(a) To revise (b) To change (c) To accept (d) To integrate
	<b>Psycho-motor Domain</b>
<b>Perception</b>	(a) To construct (b) To sketch
<b>Set</b>	(a) To design (b) To make
<b>Guided response</b>	(a) To identify (b) To fix
<b>Mechanism</b>	(a) To mend (b) To drill
<b>Complex overt response</b>	(a) To connect (b) To create (c) To change (d) To locate

8.5 SUMMARY

- Teaching objectives are the basis and final aim of educational process. This objective is kept in view while constructing the curriculum and teaching methods.
- Teaching objectives are determined according to the concepts about which qualities have to be developed in the students, which habits have to be formed in them, etc.
- Teaching objectives are needed for some causes i.e., they guide and direct, they help in curriculum construction, they help in planning the teaching experiences, they provide a basis for evaluation and they establish coordination among different levels.

Check Your Progress

8. What is the main difference between Bloom's original work and Andersen's revised work on taxonomy?
9. What type of knowledge is imparted under cognitive aspect?
10. What are the three levels of analysis?
11. Mention the six classes of learning objectives in cognitive or psychomotor domain.

## NOTES

- While determining the objectives of teaching, the desirable changes have to be analyzed as related to the three aspects of behaviour, which can be attained by the teaching of any subject.
- By the study of science, the students gain knowledge about their terms, facts, concepts, definitions, laws, theories and processes.
- By the study of sciences, the students understand the knowledge they have gained about the related terms, facts, concepts, definitions, laws, theories and process
- In modern times, the teaching of biological sciences is chiefly aimed at developing different skills in the students by which they can resolve the problems in their daily lives.
- Generally some norms which are adopted for the determination of teaching objectives, such as usefulness, contemporariness, suitability/ fitness, appropriateness, and practicability.
- Taxonomy means, 'a system of classification' and in this sense taxonomy presents a system of classification of the objectives in similar way as Dewey's decimal method or system of classification. Dewey is given the credit of classifying different books and scriptures of library with the decimal system.
- A general objective is one which is related fully to the teaching process. For example, problem-solving in mathematics, critical thinking and creativity.
- The specific objectives are limited to the concepts and theories of subject matter, for example, area, ratio, Pythagoras calculation, etc.
- Behaviour is divided into three domains - cognitive, affective and psychomotor. The taxonomy of educational and instructional objectives has also been considered to be belonging to three domains: • Activities related to head - cognitive domain • Activates related to heart - affective domain • Activates related to hand - psycho-motor domain.
- Cognitive domain includes objectives related to thinking, knowing and problem-solving. According to B.S. Bloom, memorizing or identifying knowledge and development of mental abilities and skills are included in the cognitive domain.
- Affective domain is related to aptitude, values, interests and aesthetic sense. In the affective domain are included the educational objectives of interest, aptitude, change in value, development of aesthetic sense and coordination.
- The psycho-motor domain includes the teaching objectives related to manual and motor skills. Simpson and Kibler have attempted to classify the objectives of psycho-motor domain.
- Bloom and his associates have done important work in the direction of determination of teaching objectives. Bloom emphasized not to make the achievement test subject matter centred, but objective centred. He stressed that each and every question should be related to the evaluation of one or the other teaching objective.
- The six levels of Bloom's taxonomy relate to 'cognitive' functions - i.e. functions associated with knowledge, comprehension and application.
- The benefit of Bloom's taxonomy is that it helps us identify where we, and individuals within our teams, currently are on the pyramid. Thus, we can ensure that people are learning at the right level. We can also use the pyramid to help

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- guide our people through the levels to reach the levels of learning and understanding that they need to reach in order to do their jobs effectively.
- Knowledge functions at the memory level of teaching. It is related with the pre-learning material. Under it are included two mental activities-recall and recognition-of a pre-learning material from one fact to the whole theory.
  - Bloom and his associates (Krathwohl and Maria, 1964) presented the classification of objectives of the affective domain from a lower level to a higher level.
  - The relationship of the second level of affective development is with the proper response of the students. The above mentioned level functions as the basis of receiving for this class.
  - The first attempt to classify the objectives of the conative or psychomotor domain was made by Simpson (1966). Later, Harrow (1972) developed it.
  - Non-verbal communication is behaviour by which a student is able to skilfully express is meant that behaviour by which a student is able to skilfully express himself without the use of words.
  - Psycho-muscular activities provide the necessary basis for this function. Thus, after the student has acquired complete proficiency, he becomes able to communicate by the use of normal face expressions and acting.
  - Some of the skills that are included in the teaching of biological sciences are drawing skill, computation skill, construction skill, observational skill, problem-solving skill and dissection skill.

### 8.6 KEY TERMS

- **Taxonomy:** It refers to the process of naming and classifying things such as animals and plants into groups within a larger system, according to their similarities and differences.
- **Affective Domain:** It is one of the three domains in Bloom's Taxonomy. It includes the manner in which we deal with things emotionally, such as feelings, values, appreciation, enthusiasms, motivations, and attitudes.
- **Psychomotor Domain:** This domain includes physical movement, coordination, and use of the motor-skill areas.

### 8.7 ANSWERS TO 'CHECK YOUR PROGRESS'

1. Teaching objectives are the basis and final aim of educational process. This objective should always be considered while constructing the curriculum and teaching methods.
2. Teaching objectives are required for the following causes:
  - (a) Teaching objectives guide and direct.
  - (b) They help in curriculum construction.
  - (c) They help in planning the teaching experiences.
  - (d) They provide a basis for evaluation.
  - (e) They establish coordination among different levels.

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3. Teaching objectives can be classified into different domains and groups such as cognitive, affective, experimental, skill-related, interest, viewpoint and aesthetic objectives.
4. The five norms that should be adopted for the determination of teaching objectives include usefulness, contemporariness, suitability, appropriateness, and practicability.
5. Bloom's book on taxonomy is named as *Taxonomy of Educational Objectives*.
6. Bloom has classified the teaching objectives on this basis that the teaching-learning process is an attempt to bring about a behavioural change in the students with the help of textbook or learning experiences.
7. The three domains of behaviour are – cognitive, affective and psychomotor.
8. The main difference between Bloom's original work and Andersen's revised work on taxonomy was that they changed the name for each level from a noun to a verb.
9. The types of knowledge imparted under cognitive aspect includes, the knowledge of specifics, knowledge of ways and means of dealing with specifics, and knowledge of universal and abstractions.
10. The three levels of analysis comprise of analysis of elements, analysis of relationship, and analysis of organizational principles.
11. The first attempt to classify the objectives of the cognitive or psychomotor domain was made by Simpson (1966). Later, it was developed by Harrow in 1972. Harrow has classified these objectives into the following six classes:
  - (a) Reflex movements
  - (b) Basic body movements
  - (c) Physical abilities
  - (d) Perceptual abilities
  - (e) Skilful movements
  - (f) Non-verbal communication

### 8.8 QUESTIONS AND EXERCISES

#### Short-Answer Questions

1. What are the bases of teaching objectives determination?
2. What types of skills and proficiencies will students acquire by the study of biological sciences?
3. Briefly discuss the norms used for the determination of teaching objectives.
4. Give a short comparison between Bloom's original and Anderson's revised work.
5. How has Harrow classified the objectives in the psychomotor domain?

#### Long-Answer Questions

1. Discuss in detail the teaching objectives at the school level.
2. Write a detailed note on Bloom's theory of taxonomy.
3. Describe how knowledge is classified under the taxonomy of objectives.
4. Elaborate on the three stages of comprehension.

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### 8.9 FURTHER READING

- Ornstein, Allan C. and Hunkins, Francis P. 2004. *Curriculum—Foundations, Principles, and Issues*. Boston: Allyn and Bacon.
- Taba, Hilda. 1962. *Curriculum Development: Theory and Practice*. San Diego: Harcourt, Brace & World.
- Bhatt, B. D. and Sharma, Sita Ram. 1992. *Principles of Curriculum Construction*. New Delhi: Kanishka Publishing House.
- Chauhan, S. S. 2009. *Innovations in Teaching Learning Process, 1E*. New Delhi: Vikas Publishing House Pvt. Ltd.
- Dewey, John. 2010. *The Child and the Curriculum: Including the School and Society*. New York: Cosimo, Inc.

#### Website

<http://www.unesco.org/new/en/education/themes/strengthening-education-systems/quality-framework/technical-notes/different-meaning-of-curriculum/>

# UNIT 9 TOOLS AND TECHNIQUES OF EVALUATION

## NOTES

### Structure

- 9.0 Introduction
- 9.1 Unit Objectives
- 9.2 Meaning of Educational Tests
  - 9.2.1 Characteristics of a Good Tool of Evaluation
  - 9.2.2 Different Types of Tests
- 9.3 Principles of Test Construction
- 9.4 Construction of Achievement Test and its Standardization
- 9.5 Questionnaire, Observation and Interview
- 9.6 Summary
- 9.7 Key Terms
- 9.8 Answers to 'Check Your Progress'
- 9.9 Questions and Exercises
- 9.10 Further Reading

## 9.0 INTRODUCTION

A 'test' is a particular type of assessment that typically consists of a set of questions to be answered and administered under reasonably comparable conditions for all students. In other words, it is a systematic procedure for assessing a sample of behaviour by asking a set of questions in a uniform manner. Psychological and educational tests are a standardized procedure to measure quantitatively or qualitatively one or more than one aspect or trait by means of a sample of verbal or non-verbal behaviour. A test consists of a standard set of questions to be answered or tasks to be performed. Items of a test are placed in increasing order of difficulty and its procedure of administration is standardized to ensure maximum objectivity. In the teaching-learning situation, psychological and educational tests are used to know the level of achievement of students.

In this unit, we will discuss in detail the meaning and types of educational tests and standardization of tests and also how to analyse and select test items. In addition to this, you will also study about the principles of test construction. Also, a special coverage on various norms and their usage has also been made.

## 9.1 UNIT OBJECTIVES

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

- Determine the meaning, characteristics and types of tests
- Classify the principles and methods of test construction
- Understand the standardization of tests
- Discuss the evaluation techniques like questionnaire, observation and interview



## 9.2 MEANING OF EDUCATIONAL TESTS

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An educational test is not just a test that measures achievement in subjects of study, but is also a psychological test that leads to an assessment of the overall development of a student. According to Anastasi, 'psychological test is essentially an objective and standardized measure of a sample of behaviours'. For Freeman, it 'is a standardized instrument designed to measure objectively one or more aspects of a total personality by means of samples of verbal or non-verbal responses, or by means of other behaviours'.

Test is a stimulus selected and organized to elicit responses which can reveal certain psychological traits in the person who deals with them. The diagnostic or predictive value of psychological test depends upon the degree to which it serves as an indicator of a relatively broad and significant area of response. It is obvious that a psychological test is the quantitative and qualitative measurement of the various aspects of behaviour of an individual for making generalized statements about his/her total performances.

### 9.2.1 Characteristics of a Good Tool of Evaluation

The aspects which affect the characteristics of a good test are as follows:

- Validity of the test
- Reliability of the test
- Objectivity of the test
- Usability of the test
- Comprehensive and preciseness of the test
- Administration of the test
- Test from economic viewpoint
- Availability of the test
- Appearance of the test
- Standardization of the test
- Norms of the test

Some of the important characteristics of a test are analysed below.

**Validity:** Validity of a test refers to its truthfulness; it refers to the extent to which a test measures what it intends to measure. Standardization of a test requires the important characteristic viz., validity. If the objectives of a test are fulfilled, we can say that the test is a valid one. The validity of a test is determined by measuring the extent to which it matches with a given criterion. Let us take an example, suppose we want to know whether an 'achievement test in mathematics' is valid. If it really measures the achievement of students in mathematics, the test is said to be valid, or else not. So 'validity' refers to the very important purpose of a test and hence it is the most important characteristic of a good test. A test may have other merits, but if it lacks validity, it is valueless.

Freeman states, 'an index of validity shows the degree to which a test measures what it is supposed to measure when compared with the accepted criteria'. Lee J. Cronback held the view that validity 'is the extent to which a test measures what it purports to measure'.

**Reliability:** Reliability refers to consistency of scores obtained by some individuals when re-tested with the test on different sets of equivalent items or under other variable

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examining conditions. It refers to the consistency of scores obtained by the same individuals when they are re-examined with the same test on different occasions or with different sets of equivalent items or under different examining conditions. Reliability paves the way for consistency that makes validity possible and identifies the degree to which various kinds of generalizations are justifiable. It refers to the consistency of measurement i.e., how stable test scores or other assessment results are from one measurement to another.

Reliability refers to the extent to which a measuring device yields consistent results upon testing and retesting. If a measuring device measures consistently, it is reliable. The reliability of a test refers to the degree to which the test result obtained is free from error of measurement or chance errors. For instance, we administer an achievement test in mathematics for students of class IX. In this test, Paresh scores 52. After a few days, we administer the same test. If Paresh scores 52 marks again, we consider the test to be reliable, because we feel that this test accurately measures Paresh's ability in mathematics. H.E. Garrett stated, 'the reliability of test or any measuring instrument depends upon the consistency with which it gauges the ability to whom it is applied'. The reliability of a test can also be defined as 'the correlation between two or more sets of scores on equivalent tests from the same group of individuals'.

**Objectivity:** Objectivity is an important characteristic of a good test. Without objectivity, the reliability and validity of a test is a matter of question. It is a pre-requisite for both validity and reliability. Objectivity of a test indicates two things—Item objectivity and Scoring objectivity.

'Item objectivity' refers to the item that must call for a definite single answer. In an objective-type question, a definite answer is expected from the test-takers. While framing the questions, some points to be kept in mind are: ambiguous questions, lack of proper direction, double barrelled questions, questions with double negatives, etc. These concepts affect the objectivity of a test. Let us take an example of an objective item. Suppose we ask students to write about Gandhi. This question does not have objectivity. Because, here the answers will have different perceptions for different individuals and also the evaluation. If we ask the students 'what was Gandhi's father's name', this obviously will have only one answer and even the biasness of the evaluator will not affect the scoring. So all the items of a test should be objective.

Objectivity of scoring refers to the fact that the subjectivity or personal judgment or biasness of the scorer should not affect the scores. The essay-type questions are subjective and the scores are affected by a number of factors like mood of the examiner, his language, his biasness, etc. Essay-type questions can have objectivity if the scoring key and proper directions for scoring are provided.

**Usability:** Usability of a test refers to the practicability of a test. It refers to the degree to which the test can be successfully used by the teachers/evaluators. Usability of a test depends on certain aspects which are expressed in the following manner:

- (a) **Comprehensibility:** The test items should be free from ambiguity and the direction to the test items and other directions to the test must be clear and understandable. The directions for scoring and the interpretation of scores must be within the comprehension of the user.

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- (b) *Ease of administration*: If the directions for administration are complicated or if they need more time and labour, the users may lag behind to use such tests. The directions for administration must be clear and concise. The test paper should be constructed according to the availability of time. Lengthy tests involving more time may not be preferred for use.
- (c) *Availability*: If a test is not available at the time of necessity, it lacks its usability. Most of the standardized tests are of high validity and reliability, but their availability is very less. So it is desirable that in order to be reliable, the tests must be readily and easily available.
- (d) *Cost of the test*: The cost of the test must be cheap, so that the schools and teachers can afford to purchase and use them. If it will be costly, then every school cannot avail it. So a good test should be of reasonable price.
- (e) *Ease of interpretation*: A test is considered to be good if the test scores obtained can be easily interpreted. For this, the test manual should provide age norms, grade norms, percentile norms and standard score norms like standard scores, T-scores, Z-scores etc. So 'interpretability' of test refers to how readily the raw scores of test can be derived and understood.
- (f) *Ease of scoring*: A test in order to be usable must ensure ease of scoring. The scoring procedure must be a simple one.

All the directions for scoring and the scoring key should be available, to make the scoring an objective one. The examiner's biasness, the handwriting of the examinee should not affect the scoring of a test.

### 9.2.2 Different Types of Tests

Tests are divided into different types taking into consideration their content, objective, administration system, scoring style, etc. According to mode of administration, tests are of two types:

- (i) *Individual test*: When a psychological test is administered upon an individual at a particular time, it is known as 'individual test'.
- (ii) *Group test*: When a test is administered upon a group of individuals at a particular time, it is known as 'group test'. It is mostly applicable on adult literates.

According to the ability of the student, tests are of two types:

- (i) *Speed test*: This type of test is applicable upon the individuals to know the mental speediness. Here, the time is limited and the number of questions is more and all the questions are equal in difficulty level. Railway examinations, banking examinations are the examples of speed test.
- (ii) *Power test*: This type of test is applicable upon the individuals to know the mental power or the ability. Here, time limit is not there and the individuals are expected to answer the question within as much time they like. All the questions of this test are arranged according to difficulty level and discriminating power. The essay competitions by the media are the bright examples of power test.

According to the type of items involved in the test, it can be of three types:

- (i) *Essay-type test*: Essay-type tests are otherwise known as open-ended tests. The essay question is especially useful for measuring those aspects of complex achievement that cannot be measured well by more objective means. These include:
  - (a) the ability to supply rather than merely identify interpretations and application

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of data, and (b) the ability to organize, integrate and express ideas in a general attack on a problem. Outcomes of the first type are measured by restricted-response questions and outcomes of the second type by extended-response questions. For example, 'discuss the educational philosophy of M.K. Gandhi'.

- (ii) *Short-answer type test*: This type of test requires to be written in a short-cut manner regarding a concept. It is suitable for measuring a wide variety of relatively simple learning outcomes, and it is used almost exclusively to measure the recall of memorized information. For example: 'What is measurement? Write within 50 words.'
- (iii) *Objective-type test*: In objective-type questions, the individual is expected to answer the question with the help of a word, a phrase, a number or a symbol. The test with multiple-choice items, true-false items, matching type items, fill-in-the-blanks items, one-word substitution are the examples of objective type test.

According to the method of scoring, tests are of two types:

- (i) *Machine-scored test*: The tests which are scored or assessed by the machines like computer are known as 'machine-scored test'. The Bank P.O. examination is an example of machine-scored test.
- (ii) *Hand-scored test*: The tests which are assessed by the human beings are known as 'hand-scored tests'. The classroom achievement tests is an example of hand-scored tests.

According to the principle of test construction, tests are of two types:

- (i) *Teacher-made test*: Generally 'teacher-made tests' are prepared by classroom teachers to assess pupils' growth. It is related to action research. Teacher-made tests serve different purposes viz., to measure pupil's achievement, to know how far the specific objectives have been fulfilled, to diagnose the learning difficulties, and to arrange specific remedial measures to award grades etc. This type of test only follows two steps—planning and preparation.
- (ii) *Standardized test*: Standardized tests measure the common objectives of a wide variety of schools. They have standard procedures for administration and scoring, and provide norms for interpreting the scores. A test manual and other necessary material are typically provided to aid in the administration of the test and the interpretation and use of the results. The test items are generally of high quality because they have been prepared by specialists, subject experts, pre-tested and selected on the basis of their effectiveness and their relevance to a rigid set of specification. They are specially useful for measuring general educational development, determining student's progress from one year to the next, grouping students, analysing learning difficulties, and comparing achievement with learning ability.

Standardized test and teacher-made test have been discussed later in this unit in detail.

According to the nature of the test, they are classified as:

- (i) *Oral test*: It is a kind of verbal test. In oral test, the individual is expected to answer orally. This type of tests is mostly applicable to illiterates or small children. In the public survey, the people are asked to speak something regarding the issue. In the interview board, the interviewers ask questions to the interviewee and the interviewee answers orally. This type of test is known as 'oral test'.

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- (ii) **Written test:** Here, the individual has to respond the questions in writing form. So the respondent should have the writing ability. It is only applicable upon the literates. All the written examinations are the examples of written test. It is a kind of verbal test.
- (iii) **Performance test:** This type of test is also known as 'non-verbal test'. The respondent is not expected to respond verbally. He has to perform the task. The running competition, jumping competition held by physical examination are the examples of performance test.

According to Robert Glaser, test are of two types:

- (i) **Norm-referenced test:** It is a test, or type of assessment, designed to provide a measure of performance interpretable in terms of an individual's relative standing in some known group. For example, Ram types better than 80 per cent of the class members. Norm-referenced interpretations depend on a comparison of a student's performance to that of other students whose performance defines the norms. The norms might be based on a local, state or national group, depending on the use to be made of the result. The norm-reference interpretation indicates the student's relative standing in a norm group by noting the percentage of students in the group who obtain the same or a lower score (called percentile score). An identifying feature of norm-referenced test is the selection of items of average difficulty and the elimination of items that all students are likely to answer correctly. This is useful for decisions based on relative achievement such as selection, grouping and relative grading.
- (ii) **Criterion-referenced test:** It is a test, or type of assessment, designed to provide a measure of performance interpretable in terms of a clearly defined and delineated domain of learning tasks. For example, Prakash types 80 words per minute without error. When interpretations are confined to the attainment of a specific objective, they are called objective referenced, or criterion-referenced interpretation. Current standard based assessments provide major example of criterion-referenced interpretations. The criterion-referenced interpretation focuses on the percentage of items answered correctly (called percentage on the correct score). Criterion-referenced tests include items that are directly relevant to the learning outcomes to be measured, without regard to whether the items can be used to discriminate among students. No attempt is made to eliminate easy items or alter their difficulty. The goal of the criterion-referenced test is to obtain a description of the specific knowledge and skills each student can demonstrate.

### 9.3 PRINCIPLES OF TEST CONSTRUCTION

There are many procedures of construction of achievement test but the most widely used procedure is the procedure given by Stanley and Ross. They are four basic steps used by them in the construction of achievement test. These four steps are as follows:

- Planning the test
- Preparing the test items
- Selecting the items of the test or trying out
- Evaluating the test

**Step 1 - Planning the test:** Planning is the first and most important step of standardization.

**Check Your Progress**

1. What is an educational test?
2. List some of the important characteristics of a test.
3. What does validity of a test mean?
4. Define objectivity.

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**Step 2 - Preparing Blueprint of the test:** Blueprint is a chart, (Table 6.1) which is prepared to show the distribution of items to be included in the test. This table indicates all content areas covered in the test, all objectives being tested, and all types of items from all content areas and all the objectives. This chart or table is also known as table of specification as it specifies the objectives, content and items of the test. It serves as a guideline or frame of reference for the test developer in the construction of the test.

**Step 3 - Selecting the items or Trying out:** At this stage suitable items are selected, which have been constructed by the test developer at the previous stage following the blueprint. This is the stage of seeing the constructed items in terms of its language suitability, words suitability, reliability and validity. Among the items, which have been constructed some may require to be rejected, modified or changed. Due to this fact some more items are constructed by the test developer to meet the needs at this stage, if the need arises. This process involves three distinct but different tasks to meet the above needs. The process of selection of suitable items for the test is done through a procedure called as 'try out.'

**Step 4 - Evaluation of the test and preparing final draft of the paper:** On the basis of the findings of the final try-out, the final draft of the test paper is prepared. Test manual is prepared, which includes instructions for test administration and scoring, scoring key, reliability the and validity. Instructions for the testers are also determined. Item analysis of all the items is done to find out the item workability. If any change is required, it is brought out and the final draft of the paper is ready for printing.

#### Selection of Subject Matter

During the preparation of a criterion-referenced test, the test constructor is required to take the following steps:

#### Step 1: Identifying the purpose of the test

First of all, the objectives of the test are finalized. The test developer must know the purpose of the test. He should be well informed and well aware of the purpose of the test for which it is going to be prepared.

#### Step 2: Planning the test

This step requires the following work to be done by the test constructor:

- (i) **Content analysis:** The test developer analyses the content of the test. It involves the selection of contents, i.e., the testing areas and its peripherals. He also decides the key areas of the content from where more questions are to be developed.
- (ii) **Types of items:** The decisions regarding the type of items are taken at this stage. In case of subjective type, it may be essay type, short-answer type and very short-answer type. In case of objective type, it may be multiple choice question, fill in the blanks, true or false type, sentence completion type, one word answer type, etc.,. If the test is of mixed type, then questions are developed accordingly. But it is planned at this stage what will be the proportion of objective and subjective type items in terms of marks.
- (iii) **No of items:** Total number of questions of each type which is to be included in the test is decided.
- (iv) **Weightage:** It is very important to decide the weightage of each type of items and each content area. It depends upon the level of the student being tested. As

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we move from lower to higher level, the percentage of knowledge domain items decreases and higher order thinking abilities, such as understanding, application and skill, increases. The test developer also decides the weightage of each of the content areas being included in the test considering its relevance.

- (v) **Duration of the test:** With consideration to the total number of questions in the test, the level of examinees, difficulty levels of the test items and the duration of the test are decided.
- (vi) **Mechanical aspects:** It includes the quality of paper, ink, diagrams, typesetting, font size and printing of the test papers.
- (vii) **Development of key for objective scoring:** To bring objectivity in the process of evaluation, it becomes essential to achieve interpersonal agreement among the examiners with regard to the meaning of the test items and their scoring. For this purpose, a 'key' is prepared for each paper and given to all examiners while scoring the test. They are supposed to score the test following the key.
- (viii) **Instructions for the test:** The test developer also prepares instructions for its administration, and scoring and evaluation procedure 'test manual'. It shows the whole procedure of testing. It acts as a guide to the individuals involved in testing test.

### Step 3: Preparing blueprint of the test

Blueprint is a specification chart which shows the details of the test items to be prepared. It shows all the content areas and the number and type of questions from those areas. It also reflects the objectives to be tested. The blueprint describes the weightage given to various content areas, objectives, types of items and all other details of the test. It serves as a guideline or frame of reference for the person constructing the test.

### Step 4: Construction of test items

According to the blueprint all questions are constructed, covering all the content areas, all the objectives or abilities and all types of items. Questions may be objective or subjective type as mentioned in the blueprint.

Examples of objective-based and objective-type questions:

#### 1. Multiple choice questions

- (i) Which of the following metal is present in blood?  
(a) Cobalt (b) Iron (c) Calcium (d) Sulpher
- (ii) Which of the following is not associated with photosynthesis?  
(a) Dark reaction (b) Light reaction (c) Calcium (d) Chlorophyll
- (iii) Which of the following is a port city?  
(a) Patna (b) Ahmadabad (c) Calcutta (d) Durgapur
- (iv) The capital of India was transferred from Calcutta to Delhi in the year:  
(a) 1911 (b) 1905 (c) 1912 (d) 1906

#### 2. State true or false

- (i) Pacemaker is related to lungs.
- (ii) Evaluation is a quantitative process.

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(iii) Man is mortal.

(iv) Privatization and globalization are the same concept.

The questions prepared above are objective in nature as all of them have only one correct answer. The students will get either full mark (for correct response) or no marks (for wrong response). The experience, feelings and other academic, personal or social factors of the examiners or scorers will not influence the marking of these types of questions. We can say that, no subjectivity is possible in scoring these types of tests. Hence, these are called objective type and objective-based tests.

### Step 5: Selecting the items for the test

Items have already been constructed as per the guideline of the blue print. It may be that some items are not suitable or up to the mark. To avoid this fact, generally some more questions are prepared so that if any question is rejected at any stage, it might be able to be replaced immediately. The following steps are followed to select the right item for the test. This process of selection is done through a process known as 'try out'. The process of try out involves the following steps:

(i) **Sampling of subjects:** As per the size of population for which the test is being prepared, a workable sample, say around 150 subjects, is selected on random basis. This is the sample on which the prepared items are tested for its functionality, workability and effectiveness.

(ii) **Pre-try out:** It is also known as preliminary try-out. The prepared items are administered on a sample of around ten subjects taken from the sample. The answer sheets are checked, evaluated and discussed with the candidates for any kind of problems they would have faced during the test. It is probable that they might have faced the language difficulty, words ambiguity and some other problems of this kind. These problems are sorted out. The items having these problems are rewritten or rephrased to improve and modify the language difficulties and ambiguity of the items. At the end of the pre try- out, the initial draft of the test is prepared.

(iii) **Proper try-out:** At this stage, around fifty candidates are selected from the sample and the initial draft of the test is administered on them. Answer sheets are scored and item analysis is done. Difficulty value and discrimination power of each item are calculated. The items which come within the acceptable range of difficulty value and discrimination power are selected for the test and others are rejected.

(iv) **Final try-out:** The final try-out is done on a comparatively large sample. The sample size may be more than 100 or even more, depending upon the size of population. After administration and scoring of the test, reliability and validity of the test are measured. If it is proved to be reliable and valid, it gets green signal.

### Step 6: Evaluating the test and preparing final draft of the paper

For establishing quality, an index test manual is prepared which informs about the test's norms, scoring key, reliability and validity. The final draft of the test paper is prepared. Instructions for the examinees as well as for the test administration are determined. Item analysis is performed to find out the item workability for the test. The required changes are done and final draft of the paper is ready for printing.



## 9.4 CONSTRUCTION OF ACHIEVEMENT TEST AND ITS STANDARDIZATION

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An achievement test is an instrument designed to measure relative achievement of students. It is an indispensable instrument in the teaching-learning process. The following definitions given by experts enable us to have a comprehensive view of an achievement test. According to Gronland, achievement test is 'a systematic procedure for determining the amount a student has learned through instruction'. According to Popham, 'the achievement test focuses upon an examinee's attainments at a given point in time'.

This most common technique for measuring cognitive development is supposed to yield the intended evidences about students' learning and indirectly the instructional effectiveness. Since most of the judgments about the students' achievement and teaching papers are well designed and prepared scientifically, it is necessary that the question in general and paper-setters in particular are thoroughly made conversant with the following concepts and steps for developing a good question paper (achievement test):

- (i) Knowledge of criteria of a good achievement test.
- (ii) Preparation of design of question paper.
- (iii) Development of blueprint based on the design provided or developed.
- (iv) Framing of different types of questions in accordance with the blueprint.
- (v) Development of key, model answers and marking schemes.
- (vi) Consolidation of questions and formatting the question papers.
- (vii) Preparation of question-wise analysis.
- (viii) Final editing and review of the question paper.
- (ix) Moderating of the question paper.

### Practical uses of achievement tests

Achievement test can be used for various purposes in teaching-learning process. The value of such tests is directly proportional to the extent to which the results from its use are translated into improved instructional, guidance and administrative practices in the school. The instructional uses of achievement tests are:

- For class analysis and diagnosis
- For individual pupil diagnosis
- Guidance use of achievement tests
- Alternative uses
- Administrative uses
- Aid to the parents

We know that the three basic criteria of a good question paper are: (i) validity, (ii) reliability, and (iii) usability or practicability that makes question paper must understand. Evidences collected are to be judged against these criteria, which the paper-setter

### Usability of achievement test

A question paper is usable or practicable if it is easy to construct, administer, score and interpret. It should be manageable with the funds provided. To enhance the usability of a test or question paper, the following steps are relevant:

- (i) Format of question paper should be functional.
- (ii) Include appropriate number of questions that make it time efficient.
- (iii) Include only those variety of questions with which students are familiar.
- (iv) Facilitate scoring, recording, tabulation and summarization of results.
- (v) Minimize the chances of malpractice through in-built mechanism.
- (vi) Include relevant adequate instructions, mechanism of distribution and collection of papers, time frame etc., for smooth conduct of examination.

### Reliability of achievement test

Reliability means how accurately and consistently the question paper measures the achievement from time to time, whatever it measures. It must function similarly with the similar group. Achievement test should rate the same candidates at the same score, even if it is examined by the same or the different examiners at the same or the different times. A test may be more reliable if:

- (i) Items in the test are homogenous.
- (ii) Items have median difficulty levels.
- (iii) Items are of multiple choice type.
- (iv) Test is long, i.e., more number of items are included.
- (v) Sample of population is heterogeneous.
- (vi) Items are based on higher objectives and not on memory.
- (vii) Instructions given are relevant and adequate.
- (viii) Time allowed is sufficient.
- (ix) Testing conditions are favourable.

### Validity of achievement test

It is the most significant criteria of a good question paper. Validity refers to the extent to which a test measures what it intends to measure. The validity can further be of four types: (a) content validity, (b) curricular validity, (c) empirical validity and (d) predictive validity. Important steps that ensure reasonable validity are:

- (i) Pinpoint the assessment objectives for testing.
- (ii) Give proportional weightage to each assessment objectives.
- (iii) Divide examination syllabus into content units of teaching.
- (iv) Put questions on each content unit.
- (v) Questions under (iv) are set on assessment objectives under (i).
- (vi) Avoid free option (e.g., any 6 out of 9 type) for better comparison.
- (vii) Provide internal option (e.g., This OR This type), which is balanced.

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**Designing of question paper in achievement test**

Construction of achievement test is not a simple task and requires the complete understanding and practice of all process involved in it.

**Predisposing factors**

Several factors are kept in mind while framing the question paper such as number of the paper, total time, scheme of sections, scheme of option, medium of testing, and coverage of syllabus.

**Coverage of assessment object**

In a written test, there are four major objectives: (i) knowledge, (ii) understanding, (iii) application, and (iv) skill. These objectives are also tested in terms of proportionate weightage given for the purpose of paper-setting. These weightage may vary depending on curriculum prescription, instructional strategies in vogue, and the performance standard of students over the years. The weightages would differ from unit to unit, depending on the nature and scope of content elements in each unit.

**Use of different forms of questions**

Background of student, needed objectivity, extent of acceptability, reliability, nature of subject, and the total time and the marks stipulated do limit the scope of various types of question for inclusion in a question paper. In the discussed question paper, objective types of questions were used. Following type of objectives type questions were used: MCQs, Match the Following, True/False, and Label the Diagram.

**Difficulty level of questions**

Provision must be made in the design to include questions that cater to all the ability levels of student in heterogeneous group of student. Difficulty level can be estimated on the basis of the previous experience and expert judgment and should be based on the objectives to be tested.

**Developing the blueprint of the question paper**

In order to facilitate the distribution of items under particular behaviour and content, it is always advisable to prepare a chart. A blueprint is an architectural plan of the paper-setter developed within the framework of the prescribed design of the question paper, forming the basis for framing question by translating the requirement of the design into an action plan. It provides the needed basis for maintaining validity and reliability of the evaluation tool. A blueprint is the three-dimensional chart, showing distribution of question reflecting numerical weightages in terms of emphasis to be given to: (i) different units of topic or syllabus, (ii) assessment objectives, and (iii) forms of question.

This weightage is reflected strictly in conformity with the prescribed weightage in the design. It can further reflect the scheme of option and nature of section or parts of the paper. If a blueprint is prepared with care, it reveals the complete horoscope of the 'question paper to be', indicating the various 'nuts and bolts' of the question paper. Developing a blueprint requires academic acumen and insight into the teaching of the subject.

Setting of good question paper is not everybody's cup of tea. It requires a long consistent practice of writing, criticizing, editing and improving the items. It demands

## NOTES

thorough knowledge of the criteria of a good question paper, i.e., the technical qualities like validity, reliability and usability, which makes an evaluation instrument dependable for ranking, selecting, certification of student's achievement.

**Question-wise analysis and review**

Questions are to be grouped in a manner to give a particular format that facilitates administration, scoring, analysing and interpreting the scores. It may include the following:

- Arranging question objective-wise and content-wise within each form of question, depending on the intended mode of analysis of result.
- Preparing general instructions for examinees, indicating the number of question to be attempted, mode of attempting MCQs and other relevant instruction. All instructions must be relevant, adequate, unambiguous and precisely worded.
- Ensure that within time limit the examinees are able to attempt maximum number of question to score maximum marks.
- Follow the question form, most familiar forms to less familiar forms, lower level content elements to higher content elements.

**Number of question and marks**

The purpose of numbering the question and marks is to facilitate examinees to attempt question in sequential order and the examiners to indicate marks more easily on the title cover of the answer book and Performa provided. For allocation of marks, each question has to be given marks against it if differential marks are given for various questions. If marks in asset or subset are same, common direction for marks may be given or total marks of that set can be given.

**Preparing general instruction**

Adequate instruction for the whole paper should be given at the onset. They should be clear, unambiguous, comprehensive and worded properly. Specific Instructions for the question can be given alongside.

**Administering the test**

After preparing of the test, it is administered to the students. The following points were kept in view while it was administered:

- The normal conditions were ensured such as seating arrangement, lighting etc.
- The time allowance was reasonable.
- Clear instructions with regard to recording answers, the credit given to each question and the scoring procedure to be used were given to the student.

**Scoring the test**

Scoring procedure should be simple. The scoring may be in the form of percentage marking, letter grading, description or point award. Answer keys should be prepared.

**Standardization of achievement test**

Any programme of standardization demands additional requirement like:

- More critical analysis of subject matter
- More careful formulation of test material

- More exacting refinement of test items
- More critical standards of test norms and equality of test items
- More rigid and statistical analysis than the usual test

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**Item analysis**

In order to know, whether the test item has difficulty value or not, the test item should be analysed. This can be finding out by arranging the scores of students from highest to lowest. Then take the paper of 1/3<sup>rd</sup> of students who got the highest scores and 1/3<sup>rd</sup> from the good student or not. Usually the test item should have 50 per cent difficulty for the item has good discriminating value and is worth retaining, find out the number of student who attempted the item correctly in 27 per cent high group and 27 per cent low group. This can be calculated by the following formula:

$$W_L - W_H$$

Where,  $W_L$  = Number of wrong responses in low group.

$W_H$  = Number of wrong response in high group.

If the difference between the  $W_L$  and  $W_H$  is positive, the item is the best item and should be retained.

**Difficulty value:** Determination of optimum difficulty level is as serious problem, on which the experts do not agree. However, consensus is that test as a whole should have about 50 per cent difficulty for average pupil. The modern practice of arranging the item is to cover wide range of difficulty in ascending order from easy to difficult. Thus, gradual, continuous difficulty of items if made the basis of scaling of items in the test helps the less-able and the brighter students to score the maximum. The difficulty of each choice is simply the percentage of students of students responding to that choice.

The difficulty value is calculated by using the formula:  $Dv = (RH + RL)/N$  in Table 9.1 where,

RH- Number of students attempting the item correctly from the higher group.

RL- Number of students attempting the item correctly from the lower group.

N- Number of students in the high or low group.

**Table 9.1 Calculation of Difficulty Value**

Q. No.	RHG	RLG	D.V. = $\frac{(RHG + RLG) \times 100}{N}$	INTERPRETATION	D.P. = $\frac{(RH-RL) \times 100}{N/2}$	INTERPRETATION
1	5	3	67 per cent	Selected	33 per cent	Able to discriminate
2	6	2	67 per cent	Selected	67 per cent	Able to discriminate
3	5	1	50 per cent	Selected	67 per cent	Able to discriminate
4	5	3	67 per cent	Selected	67 per cent	Able to discriminate
5	6	6	92 per cent	Rejected	53 per cent	Able to discriminate
6	5	2	58 per cent	Selected	0 per cent	Not able to discriminate
7	5	3	67 per cent	Selected	50 per cent	Able to discriminate
8	2	1	17 per cent	Rejected	33 per cent	Able to discriminate
9	6	3	75 per cent	Selected	17 per cent	Not able to discriminate
					50 per cent	Able to discriminate

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10	6	2	67 per cent	Selected	67 per cent	Able to discriminate
11	5	2	58 per cent	Selected	50 per cent	Able to discriminate
12	4	2	50 per cent	Selected	33 per cent	Able to discriminate
13	6	2	67 per cent	Selected	67 per cent	Able to discriminate
14	4	1	42 per cent	Selected	50 per cent	Able to discriminate
15	6	4	83 per cent	Rejected	33 per cent	Not able to discriminate
16	5	2	58 per cent	Selected	50 per cent	Able to discriminate
17	5	3	67 per cent	Selected	33 per cent	Able to discriminate
18	6	2	67 per cent	Selected	67 per cent	Able to discriminate
19	5	1	50 per cent	Selected	67 per cent	Able to discriminate
20	5	3	67 per cent	Selected	53 per cent	Able to discriminate
21	6	6	92 per cent	Rejected	0 per cent	Not able to discriminate
22	5	2	58 per cent	Selected	50 per cent	Able to discriminate
23	5	3	67 per cent	Selected	33 per cent	Able to discriminate
24	2	1	17 per cent	Rejected	17 per cent	Not able to discriminate
25	6	3	75 per cent	Selected	50 per cent	Able to discriminate
26	6	2	67 per cent	Selected	67 per cent	Able to discriminate
27	5	2	58 per cent	Selected	50 per cent	Able to discriminate
28	4	2	50 per cent	Selected	33 per cent	Able to discriminate
29	6	2	67 per cent	Selected	67 per cent	Able to discriminate
30	4	1	42 per cent	Selected	50 per cent	Able to discriminate
31	6	4	83 per cent	Rejected	33 per cent	Not able to discriminate
32	5	2	58 per cent	Selected	50 per cent	Able to discriminate

The difficulty value of all the test items has been calculated and tabulated in Table 9.1. Interpretation has been done according to Table 9.2.

**Table 9.2 Interpretation of Difficulty Value**

Difficulty Value	Item Analysis
0-20 per cent	Quite difficult
21-45 per cent	Difficult
46-65 per cent	Good
66-75 per cent	Average
75-80 per cent	Easy
80-100 per cent	Very easy

**Analysis**

Table 9.2 gives the difficulty value of all the items in the test. The questions which have the difficulty value within the range of 21 per cent to 80 per cent are accepted and the others falling outside the range on the both sides are rejected. According to the table, following questions should be rejected 5, 8, 15, 21, 24, 31.



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**Acceptable discriminating power**

'Discriminating power of test item' refers to the quality or magnitude of response that may be expected from individuals along a defined scale in accordance with difference in their achievement due to varying degrees of abilities. In other words, superior-ability pupils should answer the item correctly more often than those with inferior-ability. This suggests a method by which the power of a test item to discriminate between groups of pupils may be determined. For calculating the discriminate index, Kelley used the method of grouping pupils on the basis of scores into three grades. Upper group of 27 per cent making the highest scores, lower group 27 per cent making the lowest scores, and middle group of 46 per cent which are not considered for calculating D.I. The next step is the count of all test in the test. The 'discrimination index' refers to the degree to which the item discriminates between students in the high group and students in the low group.

$$D.I. = (R_H - R_L) / N$$

Where,

$R_H$  = Number of students attempting the item correctly from higher group.

$R_L$  = Number of students attempting the item correctly from lower group.

$N$  = Number of students in the high or low group.

The discriminating power of different question has been interpreted according to the Table 9.3.

**Table 9.3 Discriminating Power of Different Questions**

Discriminating Power	Item Analysis
0-20 per cent	Very less D.P.
20-40 per cent	Less D.P.
40-60 per cent	Average D.P.
60-80 per cent	High D.P.
80-100 per cent	Very high D.P.

**Analysis**

Table 9.3 depicts that 14 items have an average discriminating power, 8 items have high discriminating power. The discriminating power helps to understand the power of questions to discriminate between a bright student and a dull student, or in better words, a high scorer.

**Interpretation**

On the basis of the item analysis done by calculating discriminating value, difficulty value, and discriminating power, one gets an idea of the questions and patterns in the question paper. Standardization has its own advantages and limitations. Any programme of standardization demands additional requirement like more critical analysis of subject matter and more exacting refinement of test items.

**Reliability of the test**

Items of the present test were arranged in odd and even order to calculate the reliability. To solve this problem, Spearman-Brown formula was used. In this way, the reliability of

the present test was calculated and found to be .82, which shows that test is quite reliable.

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**DESIGN OF AN ACHIEVEMENT TEST**

Class ETE

Educational Psychology

Max. Mark: 60

Time: 2.00 hrs

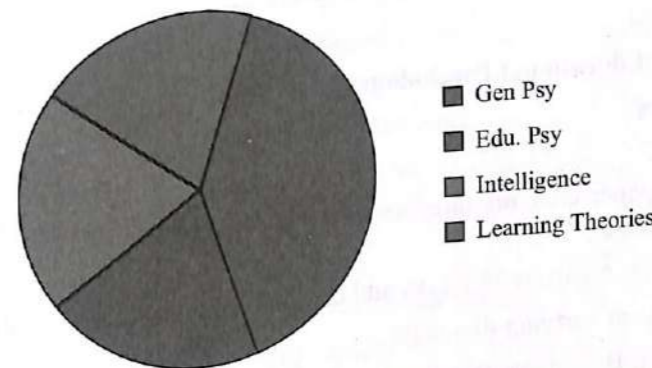
The weightage or the distribution of marks over different dimensions of the question paper shall be as follows:

1. Weight age to Components

S. No.	Learning Outcomes	Marks
1.	Knowledge	25
2.	Understanding	15
3.	Application	20
Total Marks		60

Weightage to Units/Marks

S. No.	Units/ Topics	Marks
1.	Gen Psy	26
2.	Edu. Psy	12
3.	Intelligence	10
4.	Learning Theories	12



Objectives	No. of Questions					Total
	1-2	3-4	5-6	7-8	Other	
Chapters	1-2	3-4	5-6	7-8	Other	25
Knowledge	5(1)	5(1)	5(1)	5(1)	5(1)	15
Understanding	1(3)	1(3)	1(3)	1(3)	1(3)	20
Application	-	1(10)		1(10)		60
Total	8	18	8	18	8	

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Weightage of Content

S. No.	Content	Marks	Per cent
1.	General Psychology	26	43.33
2.	Educational Psychology	12	20.00
3.	Intelligence	10	16.67
4.	Learning theories	12	20.00

Weightage to be Objective

S. No.	Content	Marks	Per cent
1.	Knowledge	25	41
2.	Understanding	15	25
3.	Application	20	34

Weightage on Types of Question

S. no.	Question	Marks	Per cent
1	Objective	25	41
2	Short-Answer	15	25
3	Long-Answer	20	34

Course Title: Educational Psychology

Time: 2.00 hrs

Class ETE

Max.Marks: 60

Note:

- 1) This paper contains three sections A, B and C. You have to answer all the questions.
- 2) Section-A carries 25 marks and contains 25 questions of multiple choice type each carrying one mark.
- 3) Section-B contains five questions and each question carries 3 marks.
- 4) Section-C contains two questions and each question carries 10 marks.

Section A

1. The principle that properties such as mass, volume and number remain the same despite changes in the form of objects 1 × 25 = 25 marks
- (a) Conservation  
(b) Conversation  
(c) Reflexive  
(d) All above

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2. The biological unfolding of the individual according to a plan contained in the genes is termed as
  - (a) Learning
  - (b) Maturation
  - (c) Pre-natal period
  - (d) Post-natal period
3. What is the variable manipulated by the experimenter at his will called?
  - (a) Dependent variable
  - (b) Independent Variable
  - (c) Intervening Variable
  - (d) Extraneous Variable
4. In this stage mode of thinking is illogical and it is neither deductive nor inductive but rather transductive, this stage is called
  - (a) Intuitive phase
  - (b) Pre-operational stage
  - (c) Concrete Operational phase
  - (d) None of these
5. Kohlberg's moral reasoning depends on thought changes in terms of
  - (a) Qualitative
  - (b) Quantitative
  - (c) Both
  - (d) None
6. The individual at this stage begins to think in rational terms, valuing the rights of human beings and the welfare of the society.
  - (a) Law and Order (Stage 4)
  - (b) Universal Principles (Stage 6)
  - (c) Interpersonal Harmony (Stage 3)
  - (d) None
7. It treats mankind to be selfish, pleasure seeking and animal like rather than social and human.
  - (a) Sexual stages
  - (b) Psychoanalysis
  - (c) Id
  - (d) Unconsciousness
8. At this stage, children are unable to distinguish between living and non-living objects.
  - (a) Concrete stage
  - (b) Pre-conceptual stage
  - (c) Intuitive phase
  - (d) Sensory motor stage
9. In the very beginning, psychology was defined as a study of:
  - (a) Behaviour
  - (b) Consciousness
  - (c) Mind
  - (d) Soul
10. The method enables the researcher to watch behaviour that occurs naturally
  - (a) Experimental method
  - (b) Correlation method
  - (c) Naturalistic method
  - (d) Case study method
11. Which area of psychology explores the relationship between body and mind?
  - (a) Cognitive psychology
  - (b) Health psychology
  - (c) Educational psychology
  - (d) Social psychology
12. Which field of psychology studies unusual behaviour of man?
  - (a) Para psychology
  - (b) Social psychology
  - (c) Space psychology
  - (d) Abnormal psychology
13. If you want to know the opinion of Indian people in a week or a day about their future plans, which method you will choose?
  - (a) Survey
  - (b) Experimental
  - (c) Case study
  - (d) Observation



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14. If you want to see the effect of counselling on the student's performance in the exam, the exam performance would be:
  - (a) Independent variable
  - (b) Dependent variable
  - (c) Control group
  - (d) None
15. X is the husband of Y. They have some dispute with each other which is at initial stage. So they should go to the
  - (a) President
  - (b) Court
  - (c) Judge
  - (d) Counsellor
16. By using the method of experimentation, we
  - (a) Manipulate dependent variable
  - (b) Do not control any variable
  - (c) Try to find out the causes of low achievement
  - (d) Try to find out the causes of high achievement
17. Psychology is considered as a science, because
  - (a) It is a systematic
  - (b) It is empirical
  - (c) It can measure the human behaviour
  - (d) All above
18. Psychology studies
  - (a) Human behaviour
  - (b) Animal behaviour
  - (c) A and B both
  - (d) None
19. If two variables go in opposite directions, then the correlation will be
  - (a)  $r = -1.00$
  - (b)  $r = 1.00$
  - (c) 'a' and 'b' both are correct
  - (d) None of these
20. There is a psycho-testing in a psycho-lab, but psychologist finds that noise outside the lab is a disturbance cause. Now he can control the variable by:
  - (a) Scolding the students who are making noise
  - (b) Calling the police
  - (c) Ringing the bell in the lab
  - (d) None of these
21. The social psychology attempts to study:
  - (a) Aptitude formation
  - (b) Attitude formation
  - (c) Changes in behaviour
  - (d) Personality
22. In African countries, psychologists want to study the impact of various health programmes on the physical health of its citizens. Which of the following is true?
  - (a) Health programme is dependant variable
  - (b) Physical health is dependent variable
  - (c) Health programme is independent variable
  - (d) None of these
23. Which is primary element of perception?
  - (a) Responding
  - (b) Selecting
  - (c) Searching
  - (d) Recalling

NOTES

24. The tendency to perceive the object as a whole is
  - (a) Inborn quality
  - (b) Perceived quality
  - (c) Acquired quality
  - (d) Observational quality
25. Housewife sees the stranger at the door as a salesman, although he is simply a new neighbour paying a social visit. State the factor that might have influenced her perception:
  - (a) Set
  - (b) Experience
  - (c) Attention
  - (d) Illusion

Section B

3 × 5 = 15 marks

26. Explain the relevance of understanding the developmental characteristics and individual difference for teachers.
27. Explain 'libido' and what are its functions in latency and genital period.
28. 'Growth and Development is based on certain principles'. Discuss the roles of these principles.
29. Explain the stages of growth and development. During early childhood, why chances of accidental injuries increase?
30. What do you know about 'experimental method'? Discuss its merits and demerits.

Section C

10 × 2 = 20 marks

31. Discuss the levels and stages of Kohlberg's theory along with its practical applications of moral development in your classroom.
32. Being a prospective teacher in what way you will apply the various principles of educational psychology in the real classroom situation?

## 9.5 QUESTIONNAIRE, OBSERVATION AND INTERVIEW

Let us study in brief about questionnaires, observation and interviews.

**Questionnaires:** An evaluation technique which consists of a number of questions related to the evaluation of a particular performance of behaviour. The questions may take the form of a simple check list (multiple options) or responded with a yes or no. These may also be open ended providing a greater scope and freedom for the student's response. The following is an example:

The laboratory work in biology makes me feel:

- (a) Bored
- (b) Confident
- (c) Anxious
- (d) Interested

Some other statements could be as follows:

- I like to draw various diagrams to illustrate the concept and processes of biology. Yes/ No
- After asking to verify a fact through laboratory work by my teacher

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**Interview:** The interview as an evaluation technique consists of a face-to-face dialogue and interaction between the examiner and examinee. The student facing the interview is required to answer or demonstrate his performance in response to questions asked by the interviewer or interview panel. In this evaluation technique, there is little or almost no time given for thinking before responding. The interviewers may ask a set of pre-developed questions or use spontaneous questions depending upon the reactions and responses of the interviewee.

**Observation:** Observation is an evaluation technique which consists of observing and taking notes of the observed behaviour by the examiner or group of examiners. This technique can be used to assess how much and in what way changes have occurred in the learning behaviour. Observation may be performed in many ways. It can be conducted quite secretly by not telling the students that they are being observed. For this purpose the examiner may hide his presence or even merge into the group. Another way is to have a controlled and formal observation, such as observing the students while they are engaged in practical work, doing sums in class or having discussions and conversation, etc.

The above explanations attempt to clarify some of the commonly employed evaluation instruments which can be used for exercising control over the process of teaching-learning.

9.6 SUMMARY

- An educational test is not just a test that measures achievement in subjects of study, but is also a psychological test that leads to an assessment of the overall development of a student.
- Test is a stimulus selected and organized to elicit responses which can reveal certain psychological traits in the person who deals with them. The diagnostic or predictive value of psychological test depends upon the degree to which it serves as an indicator of a relatively broad and significant area of response.
- Validity of a test refers to its truthfulness; it refers to the extent to which a test measures what it intends to measure. Standardization of a test requires the important characteristic viz., validity. If the objectives of a test are fulfilled, we can say that the test is a valid one. The validity of a test is determined by measuring the extent to which it matches with a given criterion.
- Reliability refers to consistency of scores obtained by some individuals when re-tested with the test on different sets of equivalent items or under other variable examining conditions. It refers to the consistency of scores obtained by the same individuals when they are re-examined with the same test on different occasions or with different sets of equivalent items or under different examining conditions.
- Objectivity is an important characteristic of a good test. Without objectivity, the reliability and validity of a test is a matter of question. It is a pre-requisite for both validity and reliability. Objectivity of a test indicates two things— Item objectivity and Scoring objectivity.
- Objectivity of scoring refers to by whosoever checked the test paper would fetch the same score. It refers to that the subjectivity or personal judgment or biasness of the scorer should not affect the scores.

- Usability of a test refers to the practicability of a test. It refers to the degree to which the test can be successfully used by the teachers/evaluators.
- Usability of a test depends on certain aspects such as comprehensibility, ease of administration, availability, cost of the test, ease of interpretation, and ease of scoring.
- Tests are divided into different types taking into consideration their content, objective, administration system, scoring style etc. According to mode of administration, tests are of two types, namely individual test and group test.
- Speed test is applicable upon the individuals to know the mental speediness.
- Power test is applicable upon the individuals to know the mental power or the ability.
- Essay-type tests are otherwise known as open-ended tests. The essay question is especially useful for measuring those aspects of complex achievement that cannot be measured well by more objective means.
- Short-answer type test requires to be written in a short-cut manner regarding a concept. It is suitable for measuring a wide variety of relatively simple learning outcomes, and it is used almost exclusively to measure the recall of memorized information.
- In objective-type questions, the individual is expected to answer the question with the help of a word, a phrase, a number or a symbol.
- The tests which are scored or assessed by the machines like computer are known as 'machine-scored test'.
- The tests which are assessed by the human beings are known as 'hand-scored tests'. The classroom achievement tests is an example of hand-scored tests.
- Generally 'teacher-made tests' are prepared by classroom teachers to assess pupils' growth. It is related to action research. Teacher-made tests serve different purposes viz., to measure pupil's achievement, to know how far the specific objectives have been fulfilled, to diagnose the learning difficulties, and to arrange specific remedial measures to award grades etc.
- Standardized tests measure the common objectives of a wide variety of schools. They have standard procedures for administration and scoring, and provide norms for interpreting the scores.
- Norm-referenced test is a type of assessment, designed to provide a measure of performance interpretable in terms of an individual's relative standing in some known group.
- Criterion-referenced test is a type of assessment, designed to provide a measure of performance interpretable in terms of a clearly defined and delineated domain of learning tasks.
- There are many procedures of construction of achievement test but the most widely used procedure is the procedure given by Stanley and Ross. They are four basic steps used by them in the construction of achievement test. These four steps are: planning the test, preparing the test items, selecting the items of the test or trying out, and evaluating the test.
- An achievement test is an instrument designed to measure relative achievement of students. It is indispensable instrument in the teaching-learning process. The

Check Your Progress

5. What are the four basic steps in formulating an achievement test?
6. List the steps involved in the selection of subject matter.
7. What is an achievement test?
8. What are the three basic criteria of a good question paper?
9. What do you mean by the blueprint of the question paper?
10. What is discrimination index?
11. What is observation as an evaluation technique?

NOTES

following definitions given by experts enable us to have a comprehensive view of an achievement test.

- Achievement test can be used for various purposes in teaching-learning process. The value of such tests is directly proportional to the extent to which the results from its use are translated into improved instructional, guidance and administrative practices in the school.
- Achievement test should rate the same candidates at the same score, even if it is examined by the same or the different examiners at the same or the different times.
- Validity refers to the extent to which a test measures what it intends to measure. The validity can further be of four types: (a) content validity, (b) curricular validity, (c) empirical validity and (d) predictive validity.
- 'Discriminating power of test item' refers to the quality or magnitude of response that may be expected from individuals along a defined scale in accordance with difference in their achievement due to varying degrees of abilities.
- Questions are to be grouped in a manner to give a particular format that facilitates administration, scoring, analysing and interpreting the scores.
- Questionnaire is an evaluation technique which consists of a number of questions related to the evaluation of a particular performance of behaviour. The questions may take the form of a simple check list (multiple options) or responded with a yes or no.
- The interview as an evaluation technique consists of a face-to-face dialogue and interaction between the examiner and examinee. The student facing the interview is required to answer or demonstrate his performance in response to questions asked by the interviewer or interview panel.
- Observation is an evaluation technique which consists of observing and taking notes of the observed behaviour by the examiner or group of examiners. This technique can be used to assess how much and in what way changes have occurred in the learning behaviour.

9.7 KEY TERMS

- **Educational Test:** It refers to a test that measures achievement in subjects of study.
- **Standardized Test:** It refers to a test that is administered and scored in a consistent or standard manner.
- **Norm-referenced Test:** It refers to a type of test, assessment, or evaluation which yields an estimate of the position of the tested individual in a predefined population, with respect to the trait being measured.
- **Achievement Test:** It refers to a test of developed skill or knowledge. The most common type of achievement test is a standardized test developed to measure skills and knowledge learned in a given grade level, usually through planned instruction, such as training or classroom instruction.

NOTES

9.8 ANSWERS TO 'CHECK YOUR PROGRESS'

1. An educational test is not just a test that measures achievement in subjects of study, but is also a psychological test that leads to an assessment of the overall development of a student.
2. Some of the important characteristics of a test are validity, reliability, objectivity, and usability.
3. Validity of a test refers to its truthfulness; it refers to the extent to which a test measures what it intends to measure.
4. Objectivity is an important characteristic of a good test. Without objectivity, the reliability and validity of a test is a matter of question.
5. The four basic steps in formulating an achievement test are as follows:
  - (a) Planning the test
  - (b) Preparing the test items
  - (c) Selecting the items of the test or trying out
  - (d) Evaluating the test
6. The following steps are involved in the selection of subject matter:
  - Step 1: Identifying the purpose of the test
  - Step 2: Planning the test
  - Step 3: Preparing blueprint of the test
  - Step 4: Construction of test items
  - Step 5: Selecting the items for the test
  - Step 6: Evaluating the test and preparing final draft of the paper
7. An achievement test is an instrument designed to measure relative achievement of students. It is indispensable instrument in the teaching-learning process.
8. The three basic criteria of a good question paper are validity, reliability, and usability or practicability.
9. A blueprint is the three-dimensional chart, showing distribution of question reflecting numerical weightages in terms of emphasis to be given to: (i) different units of topics or syllabus, (ii) assessment objectives, and (iii) forms of question.
10. Discrimination index refers to the degree to which the item discriminates between students in the high group and students in the low group.
11. Observations is an evaluation technique which consists of observing and taking notes of the observed behaviour by the examiner or group of examiners.

9.9 QUESTIONS AND EXERCISES

Short-Answer Questions

1. Mention the aspects that affect the characteristic of a good test.
2. What is usability testing and how is it performed?
3. What is the purpose of standardized test?

## NOTES

4. What were the assessment tests introduced by Robert Glaser?
5. List the instructional uses of achievement tests.
6. How can an achievement test be more reliable?
7. What are the four types of validity?

### Long-Answer Questions

1. Analyse the important characteristics of an educational test.
2. Discuss the different types of tests as per their content, objective, administration system and scoring style.
3. Describe the principles of test construction.
4. Explain the different types of evaluation techniques.

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## 9.10 FURTHER READING

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### Website

<http://www.unesco.org/new/en/education/themes/strengthening-education-systems/quality-framework/technical-notes/different-meaning-of-curriculum/>