

DIPLOMA IN ELEMENTARY EDUCATION (D.El.Ed.)

Pedagogic Processes in Elementary Schools

Block -3 Emerging Issues in Classroom Learning



NATIONAL INSTITUTE OF OPEN SCHOOLING

A - 24/25, Institutional Area, Sector – 62, NOIDA

Gautam Buddha Nagar, UP – 201309

Website: www.nios.ac.in

EXPERT COMMITTEE		
Dr. Sitansu S. Jena Chairman, NIOS, NOIDA Sh. B.K. Tripathi IAS, Principal Secretary, HRD, Govt. of Jharkhand, Ranchi Prof. A.K. Sharma Former Director, NCERT, New Delhi Prof. S.V.S. Chaudhary Former Vice Chairperson, NCTE, New Delhi Prof.C. B. Sharma School of Education, IGNOU, New Delhi Prof. S.C. Agarkar Professor, Homi Bhabha Centre for Science Education , Mumbai	Prof.C. S. Nagaraju Former Principal, RIE (NCERT),Mysore Prof. K. Doraisami Former Head, Department of Teacher Education and Extension, NCERT,New Delhi Prof.B. Phalachandra, Former Head, Dept of Education & Dean of Instruction, RIE (NCERT),Mysore Prof.K.K.Vashist Former Head, DEE, NCERT, New Delhi Prof. Vasudha Kamat Vice Chancellor, SNDT Women's University, Mumbai	Dr. Huma Masood Education Specialist, UNESCO, New Delhi Prof. Pawan Sudhir Head, Deptt. of Art & Aesthetic Education, NCERT,New Delhi Sh. Binay Pattanayak Education Specialist, UNICEF, Ranchi Dr. Kuldeep Agarwal Director(Academic), NIOS, NOIDA Prof. S.C. Panda Sr. Consultant (Academic),NIOS, NOIDA Dr. Kanchan Bala Executive Officer(Academic), NIOS, NOIDA
COURSE COORDINATOR AND EDITOR		
Prof. M.M. Mohanty , Former Director SIEMAT, Odisha		
LESSON WRITERS		
Dr. Mohit Mohan Mohanty Director (Retd.) SIEMAT, Odisha Dr. Parsuram Raisingh, Reader in Education (Retd.) N.D.W. College of Teacher Education, Bhubaneswar Sri Sudarshan Santara Senior Teacher Educator, District Resource Center, Sonapur Sri Tapas Kumar Nayak Senior Teacher Educator, Directorate of Teacher Education and SCERT, Odisha, Bhubaneswar Ms. Snehaprava Mohapatra Senior Teacher Educator, DIET, Cuttak, Narasinghpur	Dr. G.C.Nanda HOD Education, B.J.B.Autonomous College, Bhubaneswar Sri Kartikeswar Behera Senior Teacher Educator(Retd.), DIET, Koraput, Jeypur Ms. Lipika Sahu Senior Teacher Educator, DIET, Nayagarh, Rajsunakhala Sri Purna Chandra Brahma Senior Teacher Educator, District Resource Center, Boudh Dr. Rajendra Kumar Nayak, Lecturer, Department of Education, Ravenshaw University, Cuttack	Ms. Chandrika Nayak, Senior Teacher Educator, DIET, Nayagarh, Rajsunakhala Dr.(Ms) Susandhya Mohanty Principal, DIET, Angul, Chhendipada Sri Prasanta Kumar Rath Principal, DIET, Puri Dr. Durga Charan Rana Reader in Education (Retd.) Bhadrak Autonomous College, Bhadrak Sri Ananta Kishore Swain Program Manager, Center for Youth and Social Development (CYSD), Bhubaneswar
CONTENT EDITOR	LANGUAGE EDITOR	
Dr. Sushmita Mitra, Former Director, SSS, NIOS,NOIDA	Dr. A.D. Tiwari Associate Professor, Deptt. of Educational Survey Division, NCERT, New Delhi	
PROGRAMME COORDINATOR		
Dr. Kuldeep Agarwal, Director(Academic), NIOS, NOIDA	Prof.S.C.Panda, Sr. Consultant (Teacher Education), Academic Department, NIOS, NOIDA	Dr. Kanchan Bala, Executive Officer (Teacher Education), Academic Department, NIOS, NOIDA
COVER CONCEPTUALISATION & DESIGNING	TYPESETTING	SECRETARIAL ASSISTANCE
Mr. D.N. Upreti, Publication Officer, Printing, NIOS, NOIDA Mr. Dhramanand Joshi, Executive Assistant, Printing, NIOS NOIDA	M/S Shivam Graphics, 431, Rishi Nagar, Delhi-34	Ms. Sushma, Junior Assistant, Academic Department, NIOS, NOIDA

The Chairman's Message

WELCOME TO NIOS

Dear Learner

The National Institute of Open Schooling (NIOS) is an autonomous organization under the Government of India, Ministry of Human Resource Development(MHRD). It is the largest open schooling system in the world with around 2.02 million learners currently on roll at the secondary and senior secondary level. NIOS has national and international network with more than 15 Regional Centres, 2 Sub-Centres and about 5,000 study centres for its Academic and Vocational Programme within and outside the country. It provides access to learner centric quality education, skill up-gradation and training through open and distance learning mode. The delivery of its programmes is through printed material coupled with face to face tutoring (Personal Contact Programmes), supplemented by use of Information and Communication Technology- Audio/Video Cassettes, Radio Broadcast and Telecast etc.

NIOS has been vested with the authority to train the untrained teachers at Elementary Level. The training package for D.El.Ed. Programme has been developed by the NIOS in collaboration with other agencies working in field. The Institute offers a very innovative and challenging Two-year Diploma in Elementary Education Programme for in-service untrained teachers in different states according to RTE 2009.

I take the pleasure of welcoming you all to this Diploma Course in Elementary Education Programme of National Institute of Open Schooling (NIOS). I appreciate your contribution in elementary schooling of the children of your state. As per RTE Act 2009, it becomes essential for all school teachers to be professionally trained. We understand that your experience as a teacher has already given you requisite skills needed to be a good teacher. Since it is now mandatory by law, you will have to complete this course. I am sure your knowledge and experience, so far accumulated by you, will certainly help you in this Programme.

This D.El.Ed. Programme is through Open Distance Learning (ODL) mode and provides you ample opportunity to be professionally trained without being disturbed from your regular working as a teacher.

The self-instructional materials developed specifically for your use would be helpful in creating understanding and help you in becoming a good teacher apart from becoming qualified for your job.

Best of luck in this great endeavour!!

Dr. S.S. Jena
Chairman (NIOS)

Credit Points (8=6+2)

Block	Unit	Name of Unit	Theory Study Hours		Practical Study
			Content	Activity	
Block-1: Learning and Teaching Process	U1	Learning and Teaching during Early Schooling	6	4	Identification of the role of a teacher as facilitator from your own experience
	U2	Approaches to Learning and Teaching	8	5	Identification of the characteristics of child centred approach from the behaviour of your colleagues
	U3	Methods of Learning and Teaching	7	4	Differentiation amongst different methods (as mentioned) in the process of learning and teaching
	U4	Learning and Learner Centred Approaches and Methods	9	7	Seminar on classroom managerial problems in using different approaches mentioned in the unit
Block-2: Management of Learning-Teaching Process	U5	Management of Classroom Processes	6	3	Identification of material and demotivating actions taken in the classroom by teacher-colleagues
	U6	Teaching and Learning Materials	7	3	Separation of TLM in various concepts from different subject areas
	U7	Management of Multi-Grade and Multi-Level Situations	8	5	Development of activities in different subject areas in multigrade classes
	U8	Planning Learning Activities	5	3	Development of Annual calendar of scholastic & co-scholastic activities, lesson plan & lesson note
Block 3: Emerging Issues in Classroom Learning	U9	Integrated Learning-Teaching Process	5	2	Development of activities integrating concepts from different subject areas.
	U10	Contextualizing Learning Processes and Materials	5	2	Collection of folk-materials and its use in teaching-learning process

	U11	ICT in Learning	6	3	Development of ICT tools for transacting lessons
	U12	Computer-assisted Learning	6	3	Computerised analysis of learners' achievement in different subjects
Block-4: Learning Assessment	U13	Basics of Assessment and Evaluation	7	3	Conducting CCE in any one of the subject area
	U14	Tools and Strategies of Assessment	8	5	
	U15	Using the results of assessment for improving learning	7	3	Development unit test in different subject areas
	U16	Learning and Assessment	7	3	Analysis of question paper on different subject areas Study of different ways of sharing result of student performance with various stakeholders
		Tutoring	15		
		Total	122	58	60
Grand Total			122+58+60=240 hrs.		

Block 3

Emerging Issues in Classroom Learning

Block Unit

Unit 9 Integrated Learning-Teaching Process

*Unit 10 Contextualizing Learning Processes and
Materials*

Unit 11 ICT in Learning

Unit 12 Computer-assisted Learning

BLOCK INTRODUCTION

Block Introduction-3

You as a learner will study block 3 : Emerging Issues in Classroom Learning. This block consist four units related to issues emerging in classroom learning. Every unit is divided into sections and subsections. In block 1 you have studied about learning and teaching process and its various aspects. In block 2, you have studied about management of learning and teaching process including management of teaching learning material and planning of learning activities.

Unit-9 : This unit will provide the exposure about concept of integrated learning, its basic characteristics and different types of integration i.e. within subject areas, between subject area and beyond subject areas. It will help in planning for integrating learning experiences and provide the understanding about integrated textbooks and materials.

Unit-10 : You will be able to understand the socio-cultural context of learning and its importance for facilitating learning of different categories of disadvantaged learners in the classroom. A separate focus on education of girls, education of children of minority groups and education of children with special needs is to be given in this unit. A considerable importance is given to education of tribal children. These children are disadvantaged in two ways because not only they have extreme forms socio-economic backwardness but have different forms of cultural and linguistic traditions which are distinctly different from others social groups. Their problems need to be given proper attention by properly understanding the socio-cultural components and planning multilingual classroom.

Unit-11 : This unit will empower you to understand the Meaning of Information Communication Technology (ICT), different tools of ICT and finally ways of integration of ICT in the classroom learning and Assessment process. ICT can assist in promoting more learner centred and interactive learning.

Unit-12 : This unit will help you to understand the importance of computer in learning. A detailed understanding of computer, its functional units, its major components, basic operation is given in this unit. Computer is more than an electronic gadget and considered as a source of learning as it provides the internet based learning also. The computer assisted learning is treated as more learner centered. The teacher should know how to plan for computer assisted learning.

CONTENTS

<i>Sr. No.</i>	<i>Unit Name</i>	<i>Page No.</i>
1.	Unit 9: Integrated Learning-Teaching Process	1
2.	Unit 10: Contextualizing Learning Processes and Materials	22
3.	Unit 11: ICT in Learning	61
4.	Unit 12: Computer-assisted Learning	75



UNIT 9 INTEGRATED LEARNING AND TEACHING PROCESSES

STRUCTURE

- 9.0 *Introduction*
- 9.1 *Learning Objectives*
- 9.2 *Concept of Integrated Learning*
- 9.3 *Process and Types of Integration*
 - 9.3.1 *within subject areas*
 - 9.3.2 *between subject areas*
 - 9.3.3 *beyond subject areas*
- 9.4 *Planning for integrating learning competencies/experiences*
- 9.5 *Integrated textbook and materials*
- 9.6 *Let us sum up*
- 9.8 *Model Answers to Check Your Progress*
- 9.9 *Suggested Readings and References*
- 9.7 *Unit- End Exercises*

9.0 INTRODUCTION

We all are familiar with the time table of classroom teaching activities. The total school working hours on a working day are divided into 6 or 7 periods of nearly equal duration, about 40 or 50 minutes each. In each period topic from a subject is taught or discussed. For example, Language is taught in the first period, Mathematics in the second period followed by Science, Social Studies in the subsequent periods. The allotment of subject for each period of a day is decided by the teachers while framing the routine of activities. Once the time table is decided for a class it remains unchanged for quite a long period, at least for six months and the classroom transactions of subjects are strictly as per the time table except on very special occasions.

Normally, each subject in a particular class is allotted to a particular teacher to teach. That means in each period the students of a class would be taught by a different teacher teaching different subject/topic. Exceptions are also there. When



Notes

there are less than the required numbers of teachers, a teacher has to take more than one period in a class on any given day. As you know, in many primary schools in our country only one teacher is assigned to one class for one academic year. He/she has to take care of the students in that class throughout the day teaching all the subjects of the curriculum meant for the class without disturbing the time table. Here is a situation to visualize.

Situation 1: *Ms. Sarah teaches children in class IV of a rural school. She was taking a class on 'Drinking Water'. Instead of teaching them directly, she took the students to the place in the school where drinking water system was placed. She had the following conversations with the students.*

Ms.Sarah: "Well students, observe carefully and describe the materials used for getting drinking water."

Students: "A big pot with cover on a wooden stand, a bucket, a ladle with a long handle, four stainless steel glasses, a soap and a brush for cleaning the pot and the glasses."

Ms.Sarah: "We are going to fill the pot with safe drinking water for today's use in the school. Tell me what shall we be doing?"

Students: "Clean the pot and the bucket, bring water from the nearby tube well or the well, fill up the pot by filtering it with a clean piece of cloth and then cover the pot."

The children were very enthusiastic with the answer, as they knew what was involved in using the system every day in the school. Sarah continued.

Ms.Sarah: "Why do you clean the pot and the bucket?"

Students: "Water in clean pots is free of germs which cause disease."

Ms.Sarah: "What else should you do to keep the drinking water germ free in the pot?"

Students: "Filter the water from the well and keep it covered."

Sarah went on discussing with the students how to keep the surrounding of the drinking water site clean. Then she shifted her discussion to carrying water from the tube well and filling the water pot. Since, buckets were of large size which were difficult for the students to carry when filled with water, Ms.Sarah brought four cans of equal size which would be easier for students to carry. She wanted the students to make some simple estimate. She told them that the pot can be completely filled with full five buckets of water and the students should tell her how many cans of water would fill the pot. The students were hence challenged with a thought provoking question.



Mr. Kahnu suggested filling the pot with the cans and counting the number of cans full with water required to fill the pot. Ms. Uma told that at a time four students with one can each could fill the pot and if it would be possible to count the number of times it took the four students to fill the pot completely, then the result could be arrived at by multiplying the number of times with four. Mr. Kartar thought for a while and told that if it could be known as to the number of cans required to fill a bucket, then multiplying this number by five would give the required result.

While the children were busy in cleaning and filling the pot, Ms. Meena and Ms. Shahana began singing “Pani re pani....” and others joined the chorus. At the end of the class, Sarah could give the following three tasks:

- *What are the ways of collecting clean water for drinking?*
- *If it takes 20 minutes for four students to fill the water pot, how many minutes would five students take to fill up the same pot, filling at the same rate?*
- *Describe within 25 sentences, the efforts made by the class to collect and store drinking water.*

You will agree that unlike the subject based classroom activities, Ms. Sarah was relying more on the real life experiences for learning and teaching. She took the drinking water as the basic theme which is quite meaningful and familiar in the real life for all children in the class. Based on this concrete real life experience, she introduced the concepts from different subject areas which were more contextual to the main theme and hence meaningful for the learners. This is a simple example of a situation where integrated learning is taking place. Such integrated approach of learning and teaching is considered more contextual and meaningful for learners especially for young children in the primary schools than the subject based approaches that are usually followed.

In this unit, let us know the basic characteristics and different types of integrated learning which will enable you to adopt appropriate approach of integrated learning in your classes.

To complete and comprehend different concepts in this unit, you will need 07 hours of study.

9.1 LEARNING OBJECTIVES

After completing this unit you will be able to:

- explain the concept of integrated learning, its needs and relevance.
- describe different types of integration and their use in meaningful learning.



Notes

- use the techniques to integrate learning experiences within one subject and integrating different subjects.
- identify the characteristics of integrated text books and learning materials

9.2 CONCEPT OF INTEGRATED LEARNING

Let us consider a situation given below.

Situation 2: Ms. Sushma teaches Science while Sophia teaches Language in the same class VI. While Ms. Sushma was teaching the characteristics of different parts of a plant, Sophia was trying to develop appreciation of beauty in nature through a poem in the text. One day both of them decided to take the class together combining Science and Poetry. The topic they chose was 'Flowers'. They planned the lesson in detail where in Ms. Sushma was to deal with different types of flowers and the parts of a hermaphrodite flower (a complete flower) and Ms. Sophia was to recite and develop appreciation for beauty of different types of flowers. But due to some accident Ms. Sophia had to remain absent in that class. Ms. Sushma carried on teaching with the plan both of them prepared together.

This may sound absurd but what Ms. Sushma was using is integrated teaching-learning process.

There are several related terms used in the context of integrated learning and teaching like 'integrated curriculum', 'interdisciplinary teaching', 'multi-disciplinary teaching', 'thematic teaching', and 'synergistic teaching'. Let us examine some of the definitions offered by researchers working on integrated learning and integrated curriculum:

- *"An integrated study is one in which children broadly explore knowledge in various subjects related to certain aspects of their environment" (Humphreys, Post, and Ellis, 1981 p.11).*
- *Integrated learning refers to "education that is organized in such a way that it cuts across subject-matter lines, bringing together various aspects of the curriculum into meaningful association to focus upon broad areas of study. It views learning and teaching in a holistic way and reflects the real world, which is interactive." (Shoemaker, 1989, p. 5)*
- *Jacobs defines integrated or interdisciplinary as "a knowledge view and curricular approach that consciously applies methodology and language from more than one discipline to examine a central theme, issue, problem, topic, or experience" (1989, p. 8).*
- *"Integrated curriculum is a way to teach students that attempts to break*



down barriers between subjects and make learning more meaningful to students. The idea is to teach around themes or 'organizing centers' that students can identify with, such as 'The Environment,' 'Life in School,' or more traditional areas like 'Myths and Legends.'; (Beane, 1977, pp. 13 - 14).

In general, all the definitions of integrated curriculum or integrated teaching include the following:

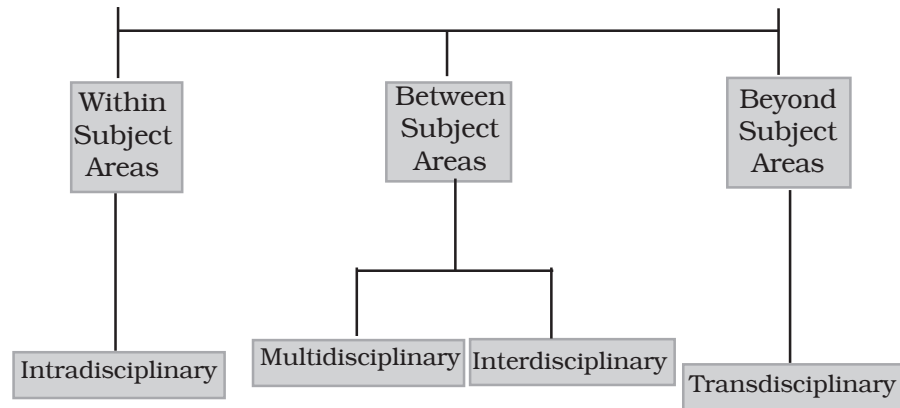
- *A combination of subjects:* More than one curricular subject area are combined together to evolve a natural continuum of contents and activities which is related to the earlier experiences and relates to the real life issues of the learners.
- *Sources that go beyond textbooks:* Since the integrated materials relate to the direct and real world experiences of the learners, the transaction goes beyond the contrived, abstract and unfamiliar textbook materials.
- *Relationships among concepts:* The concepts selected from different subject for preparing an integrated lesson are interrelated with each other so as constitute a meaningful whole for the learner. Holistic meaning is more important than fragmented unrelated concepts which carry very little learning for the learners.
- *Thematic units as organizing principles:* The integration of the related concepts is invariably around a theme familiar to the learners like 'Water', 'Fire', 'Environment', 'Election'
- *An emphasis on projects:* A project relates to a social issue concerning the learner which is carried to completion in its natural setting. In order to complete a project, the learners, preferably work in groups, are required to combine all their knowledge and experience relating to different disciplines in order to solve a real life problem.
- *Flexible schedules:* The integrated teaching- learning cannot be confined to any fixed period within the classroom time table. Enough of freedom has to be given both in terms of time and space for effective transaction of integration of concepts.
- *Flexible student groupings:* In order that the integrated learning to be meaningful and effective for the learners, flexibility in grouping, preferably heterogeneous grouping with students' interest and choice, need to be adopted. Heterogeneous grouping helps in building a natural setting and peer learning.

E1. State at least three differences of an integrated teaching from the traditional subject-based teaching.



9.3 PROCESS AND TYPES OF INTEGRATION

Integration may be classified in four different ways as shown in Fig. 1.



9.3.1 INTEGRATION WITHIN SUBJECT AREA

Integration within one subject area or Intra-disciplinary Integration is a process of integration where the knowledge and skills of same subject are connected together during the teaching learning process. In other words, it is a process of combining different concepts of several topics within the same subject during the process of classroom transaction.

For example:

- In language teaching, we can combine reading, writing and oral communication skills through story telling.
- In environmental studies in class II, different topics like 'Family', 'Neighbourhood', 'Festival', 'Occupation' etc. can be linked together in the context of personal and social relevance of discussing 'Life in Our Village'
- In Mathematics the concepts of percentage, decimal fractions, calculation of interests can be combined to learn profit and loss.

9.3.2. INTEGRATION BETWEEN SUBJECT AREAS

The process of integrating the knowledge and skills of two or more different subjects during the teaching- learning process may be of two types: Multidisciplinary and Interdisciplinary.

Multidisciplinary Integration: In multidisciplinary integration the subject area outcomes remain distinct, but due to some meaningful linkages they are connected together during the process of transaction. Fig 9.2 given bellow shows the relationship of different subjects to each other and a common theme i.e. WATER.

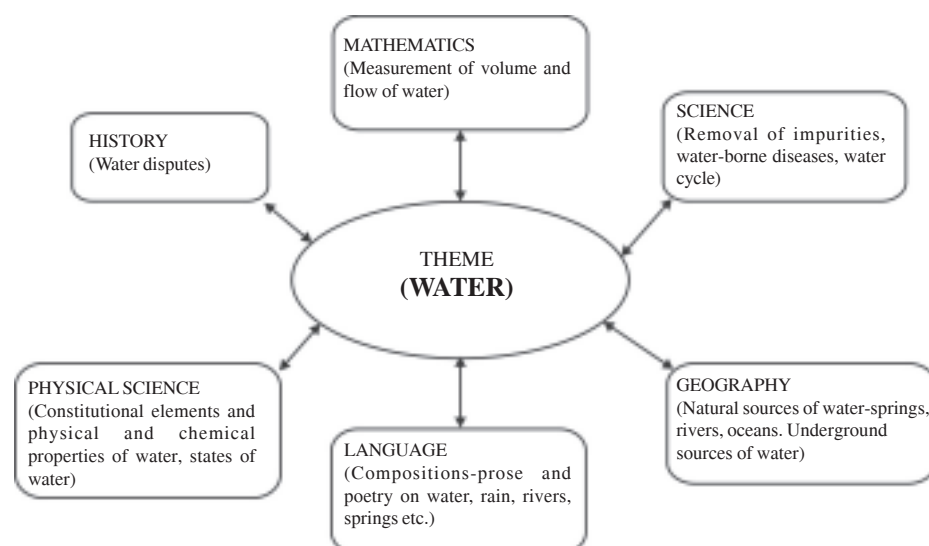


Fig. 2: Example of Multidisciplinary Integration

Interdisciplinary Integration: Interdisciplinary integration is a process of integrating the interdependent or common knowledge and skills from more than one subject areas during transaction process. For example, concepts of mathematics and science are acquired by integrating to singing, sculpting, and painting and dancing.

9.3.3 INTEGRATION BEYOND SUBJECT AREAS

Integration beyond Subject Areas or Trans-disciplinary integration is a process where the students' day to day experiences are connected to the different subject areas to acquire knowledge and skills. In other words interdisciplinary and disciplinary skills in a real life context are focused in Trans-disciplinary integration. For example, Project based learning and teaching. In a project based learning students tackle a local problem and learn the concepts and skills through the process of exploring and solving projects.

9.3.4 COMPARING AND CONTRASTING THE THREE APPROACHES TO INTEGRATION

Given below in Table 1 the comparison and contrast are some aspects of comparison between the three approaches of integration.

Table 1- Comparison of Three Types of Integration

	Multidisciplinary	Interdisciplinary	Trans-disciplinary
Organizing Center	<ul style="list-style-type: none"> Standards of the disciplines organized around a theme 	<ul style="list-style-type: none"> Interdisciplinary skills and concepts embedded in disciplinary standards 	<ul style="list-style-type: none"> Real-life context Student questions
Conception of Knowledge	<ul style="list-style-type: none"> Knowledge best learned through the structure of the disciplines A right answer One truth 	<ul style="list-style-type: none"> Disciplines connected by common concepts and skills Knowledge considered to be socially constructed Many right answers 	<ul style="list-style-type: none"> All knowledge interconnected and interdependent Many right answers Knowledge considered to be indeterminate and ambiguous
Role of Disciplines	<ul style="list-style-type: none"> Procedures of discipline considered most important Distinct skills and concepts of discipline taught 	<ul style="list-style-type: none"> Interdisciplinary skills and concepts stressed 	<ul style="list-style-type: none"> Disciplines identified if desired, but real-life context emphasized
Role of Teacher	<ul style="list-style-type: none"> Facilitator Specialist 	<ul style="list-style-type: none"> Facilitator Specialist/generalist 	<ul style="list-style-type: none"> Co-planner Co-learner
Starting Place	<ul style="list-style-type: none"> Disciplinary standards and- procedures 	<ul style="list-style-type: none"> Interdisciplinary bridge KNOW/DO/BE 	<ul style="list-style-type: none"> Student questions and concerns Real-world context
Degree of Integration	<ul style="list-style-type: none"> Moderate 	<ul style="list-style-type: none"> Medium/intense 	<ul style="list-style-type: none"> Paradigm shift
Assessment	<ul style="list-style-type: none"> Discipline-based 	<ul style="list-style-type: none"> Interdisciplinary skills/ concepts stressed 	<ul style="list-style-type: none"> Interdisciplinary skills/ concepts stressed

(Source: Drake & Burns (2004))

E2. Write down at least two differences between multidisciplinary integration and trans-disciplinary integration

9.4 PLANNING FOR INTEGRATED LEARNING

The ideas of lesson plan and unit plan has been discussed in Unit -8 of Block –II to a great extent. In this section let us understand the ideas of integrated planning in the subject, among the subjects and beyond the subjects.



9.4.1 INTEGRATION WITHIN SUBJECT AREAS

Have you ever thought of combining or integrating different concepts related to a topic while teaching a particular subject in a class?

Normally, we do not think of the possibility of integration within a subject area and we strictly go by the order of presentation of the concepts in the textbooks. Suppose you are teaching 'Living and Non-living beings' in Science to class VI students. There are so many concepts which are related to the topic like differences between living and non-living on the basis of reproduction, movement, food and metabolism, etc. and other concepts such as ecological balance among different types of living beings, depletion and conservation of natural resources related to the growth in population of living beings etc. You can observe that the learning objectives of one topic may have some sort of relation with those of another topic of the same subject. If such related concepts could be regrouped, the learners can have more holistic and meaningful learning of the issue or topic that is being discussed in the class. To avoid repetition in learning and to make learning meaningful, it is better to link different competencies even in the same subject.

While preparing the integrated plan within a subject, following steps may be considered:

- Determine the distinctive nature of learning in each subject area.
- Determine the competencies/ outcomes of learning in each topic under the specific subject area.
- Identify knowledge and skills (competencies/outcomes of learning) connected to the topic that you are planning to teach.
- Plan learning experiences for the teaching of the topic which need to be connected closely to the real life experience of the student as far as possible.

For example, in the subject i.e. EVS of class-II the following steps and process have been illustrated in **Table 2** to indicate integration of concepts. The plan is a sample of integrated approach of planning process. Keeping intact the purpose of integration as a result of which the desired competencies can be attained, you plan the steps of integration as per your suitability.



Notes

Table 2- Integration in Class-II EVS

Topic	Competencies	Process of integrating the competencies
“Village Festival” (Integration of my family with my neighbourhood)	<ul style="list-style-type: none"> Identifying the work of different family members. Activities of the students to help the family. Identifying the importance of neighbourhood. Recognizing the different social institutions. 	<ul style="list-style-type: none"> What do you see in the village festival? Who organizes the work? Do all the members of village do same thing in the festival? State the name of family members and what they do in day time. Do they all do same or different work? If different, who does what? What do you do at home? Who helps you in doing your work? How do you help others at home? Describe the help you receive from outside your family. Name the persons, places or the organizations from which you get support. Discuss in group to name the places he/she has seen: market, hospital, post office etc. Discuss group wise about the functions of different places and institutions.

**ACTIVITY-1**

Develop a plan of integrating different competencies to teach ‘Profit and Loss’ in Mathematics to class V students.

9.4.2. INTEGRATING DIFFERENT SUBJECT AREAS (MULTIDISCIPLINARY INTEGRATION)

You will agree that in each class each subject is taught following separate and specific methods supposed to be appropriate to the nature of the subject. For example, induction is typically used only in Mathematics, storytelling in History,



and nature observation in Science and EVS. However, do you think that storytelling can also be used to make Mathematics teaching more interesting for students in early grades?

Using different methods with flexibility would help you not only in making the lesson more interesting for students, but also in integrating different subjects meaningfully. There are linkages among the different subjects regarding their competencies or learning outcomes. You need to link the topics of different subjects in a particular class for effective learning and to avoid repetition. Let us discuss some strategies of preparing integrated plan in which the following may be considered:

- Bring together topics, themes, issues or big ideas and learning outcomes from more than one subject area keeping the subject specific outcomes distinct;
- Knowledge and skills are learned through individual subject areas but at times connect to cross-curricular topics, themes, issues or big ideas;
- Determine the distinctive nature of learning and effective methods of learning in each subject area;
- Examine the possibilities of combining concepts from different subject areas through an integrating method of learning and/or teaching.
- The students are guided to see linkages between subject areas.

As an illustration, observe the outlines of an integrated plan for the subjects like language, environmental studies and mathematics of class-II given in Table 3.

Table 3- Integration of Concepts in Language, EVS and Mathematics (Class II)

Topic	Competencies	Process of integrating different subjects
The Story of Aaruni	<p><i>Language:</i></p> <ul style="list-style-type: none"> - Reading the story with correct pronunciation, - Make question to get the answer, - Read the picture and describe the story. <p><i>EVS:</i></p> <ul style="list-style-type: none"> - Describe about different season and specially rainy season, 	<ul style="list-style-type: none"> - Make students sit in a circle and tell the story following appropriate story telling method. - Make small size groups of students for them to prepare questions, inter group interaction and correction. - Make the students to arrange the pictures sequentially (supplying the situational pictures) to describe the story.



Notes

<ul style="list-style-type: none"> - Name the crops cultivated during rainy season, - Name the instruments used for cultivation, - Differentiate between the ground water and rain water, - Say the causes of water pollution and common diseases during rainy season. <p><i>Mathematics:</i></p> <ul style="list-style-type: none"> - Geometrical shapes of the crop fields - Measures (Non-standard unit) of water i.e. container - Subtraction through objects 	<ul style="list-style-type: none"> - Make the students to describe their feeling in rainy season. <p><i>Ask the students to</i></p> <ul style="list-style-type: none"> - describe the crops cultivated in this season. - list out the use of instruments for cultivation(Traditional and modern technology) - differentiate the quality of ground water and rain water. - discuss rain water pollution and common diseases. <p><i>Further ask the students to:</i></p> <ul style="list-style-type: none"> - discuss on geometrical shapes relating to the crop fields. - discuss about the different measures of water(both standard and non-standard measures). - draw freehand sketch of a map of different sizes of the crop fields. - List different types of non-standard units found to be used in their locality.
--	---

The integrated plan can be more effective if the activity based approach discussed earlier in Unit-4 of Block-1 is used in classroom transaction keeping the desired competencies in view.

9.4.3 INTER-DISCIPLINARY INTEGRATION (BETWEEN /AMONG THE SUBJECT AREAS)

Interdisciplinary integration is somewhat similar to multidisciplinary integration. In multidisciplinary integration some linkages among different subjects are identified and connected for integrated planning but in interdisciplinary integration interdependent or common knowledge and skills from different subjects are identified and integrated for planning and transaction purposes. The following steps may be followed for planning interdisciplinary integration:



- Topics, themes, issues or big ideas and learning outcomes are identified from more than one subject area.
- The common learning outcomes are identified.
- Knowledge and skills are learnt beyond the immediate lessons.
- The students are guided to acquire the curricular knowledge and skills through integrated approach of learning.

In the process of interdisciplinary integration, the concepts and skills from different subject areas/disciplines are combined for strengthening a core skill/competency. The learning outcome/skill/competency forms the core around which the relevant concepts from various subjects are arranged to strengthen it in a most natural way connected to the real life experiences of the student as far as possible.

A diagrammatic representation of the interdisciplinary integration is presented in Fig.9.3:

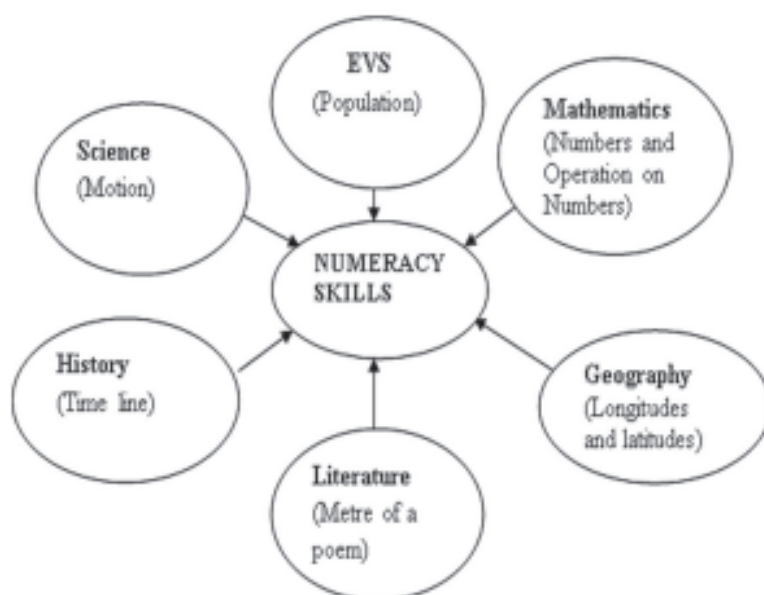


Fig 3: Numeracy Skills in Different Subject Area Competencies

Notice that the planning process of the interdisciplinary integration is similar to that of the multidisciplinary integration.

9.4.4 TRAN DISCIPLINARY INTEGRATION (BEYOND SUBJECT AREA)

Almost all the learning experiences provided in the classroom and school is based on the curricular subjects and textbooks on those subjects. But, as we all know, there is unlimited scope available in and out of the school for learning not



Notes

only the intended curricular outcomes but also much more than those. If we can expose our students to those experiences, their learning can be strengthened and enriched. There are innumerable ways of integrating those experiences in building a holistic plan for learning of children at different levels of schooling. Here are some suggestions as to how you can go about it:

- Have the list of competencies/learning outcomes of each subject of each class, normally available in the school, ready with you.
- Plan the co-scholastic activities with regular intervals. These should include participation in local festivities, observation of important social and cultural functions, visit to market and other important places/institutions in the locality, conducting various cultural activities in the school, witnessing games, sports and other entertaining events.
- Before the students join the events, list the skills/competencies/learning outcomes the students can acquire from the events. This list has to be finalized in consultation with the students and may contain the learning outcomes from more than one subject area. Here the skills and competencies are more important than the subjects.
- After the students come back from the events, have a discussion with the student regarding the new knowledge or experience they have acquired besides the earlier planned outcomes. On most occasions, you will find students have acquired much beyond the planned outcomes.
- After the discussion request the students to prepare a brief report of their experiences gained from the event. This would not only enhance their composition abilities, but would help them to reflect upon their gains and would further help them to sustain the gains.

In brief, trans-disciplinary integration helps in

- (i) making learning more meaningful while reinforcing the curricular learning outcomes,
- (ii) acquiring more skills and competencies than planned,
- (iii) making learning more contextual and real life related
- (iv) realizing that every situation, be in school or outside the school is a source of learning, and
- (v) strengthening the belief that learning is a continuous process not confined only to the confines of the school and curriculum.

Trans-disciplinary integration is one way to actualize the main guiding principle of the NCF 2005 i.e. *'connecting knowledge to life outside the school'*.

E3. State the steps of planning for trans-disciplinary integration.



9.5 INTEGRATED TEXT BOOK AND MATERIALS

We have so far discussed how curriculum and teaching learning processes can be integrated breaking the boundaries of subject specific categorization of concepts and experiences. Can the textbooks be integrated in the same manner?

We are mostly acquainted with textbooks that are subject-based for each class. The concepts in these books are arranged in a sequence as considered convenient for teaching rather than for convenience in learning. Most of the contents in these textbooks are theoretical, abstract and based on contrived experiences rarely relating them to the real experience of the learner. Thus there are advantages and limitations of a textbook which is illustrated in Table 4 below.

Table 4- Advantages and Limitations of Textbooks

Advantages	Limitations
<ul style="list-style-type: none"> • A textbook can be used as a syllabus. • Some learners need a textbook to focus. • A textbook serves as a time regulator. • Patterns (structure) in learning can help knowledge retention. • Textbooks provide ready-made learning materials. • Students can prepare for lessons ahead of time. • A class without a textbook may seem unprofessional to students. • Well-designed textbooks assure quality lesson plans. • A textbook provides support for inexperienced teachers 	<ul style="list-style-type: none"> • Topics in the textbook may not be relevant or interesting. • Textbooks may present idealized worldviews and distort real issues. • Textbooks may not suit students' individual learning styles. • Textbooks may inhibit teacher's creativity. • The teacher may not agree with the content, structure, or methodology of the textbook, but is forced to use it. • The textbook may contain inauthentic language.

Source: www.sendaiedu.com (2011)

When the teaching learning processes are becoming more and more learner-centric, it is becoming difficult to base classroom transaction on the traditional subject specific textbooks, especially in the classes of primary schools.

In Unit 4, while discussing activity based approach, you might have realized that learning activities are related to real life problems and situations. At the beginning stage of schooling, the learning activities replicate those with which the child is



Notes

familiar in his/her locality which makes the transition of the child from his/her home to school easier. Which activities of the child at his/her home is specific to any subject area? Can you recall?

When the child comes to the school for the first time, s/he has acquired a lot of experience like talking freely and expressing his/her thoughts using appropriate language, knows how to respect others, has developed habits of cleanliness, has simple ideas about the market, and several such other things. These knowledge or experiences are not learnt in any compartmentalized manner. If you analyse any activity of the child, you will find each one integrates several units of concepts/ experiences. From such analyses you can realize that integrated learning is very natural with children. Therefore, in the early grades, activity-based approach supported by integrated textbooks and materials provide facilitating conditions for learning.

**ACTIVITY-2**

List the characteristics of a textbook you consider to be an excellent. one.

Source: www.sendaiedu.com (2011)

Things to look for in a good textbook

- The textbook should fit the needs of your class, as well as the national requirements.
- The instructions should be clear and easy to follow.
- The textbook should utilize a variety of learning styles.
- The content should be relevant and useful to the present and future needs of the students.
- The textbook should contain a variety of interesting topics and tasks with appropriate visual aids.
- Objectives in the textbook should be clearly stated and implemented throughout it.
- The textbook should encourage students to form their own opinions and learning strategies.

9.5.1. CHARACTERISTICS OF INTEGRATED TEXTBOOKS

In subject or content- centred textbooks i.e. the textbooks with which we are familiar, the topics are arranged based on content topics and within each topic the concepts are sequentially arranged from simpler to complex concepts. The



arrangement of topics and concepts within the topics follow a definite logical order which is mainly based on convenience for teaching. At the end of each topic, some questions or exercises are usually given as assignments for students which require invariably written responses. The text material is also written in a serious tone. There is hardly any humour, cartoon or activity for students to do in these texts.

ACTIVITY-3

Take one topic each from the textbooks on Language, Mathematics and EVS of class V and analyse the structure of each topic in terms of the title, the length and nature of presentation of the text, the illustrations and pictures used and their relevance, the concepts in the text, the learner friendly elements in the text, the topic-end exercises and determine the differences, if any, in the structures of the three texts

Integrated textbooks, usually with integration between subject areas (either multidisciplinary or interdisciplinary in nature), are intended primarily for facilitating learning rather than teaching. Therefore, the major characteristics of such textbooks are:

- The concepts from different subject areas are arranged around a theme which is familiar and/or joyful to the student in his/her real life. The themes may be water, fire, market, any festivity, circus, a comic story, a cartoon, a puzzle, a popular poem and the like.
- The themes are based on contexts related to the real life situations and as such provide ample scope to the student for meaningful learning.
- Each lesson is profusely illustrated with pictures, diagrams, examples, etc. Each illustration is appropriate to the topic and there are provisions for utilizing these illustrations in learning activities.
- Each lesson has inbuilt provision of learning activities which have to be performed by the learner while going through the text. These activities are diverse in nature. Some of these activities are drawing, painting, composing creative passages, developing models, collecting materials and information, matching figures, words and events and the like. Integration without activity is absurd (Why??).
- There are interactive elements inbuilt within the text which enables a student to interact with others and also with him/her. Examples of such provisions in the text are “frame and ask questions”, “have dialogue with the teacher”, “participate in group work with peers”, “think for a while” etc.



Notes

- A variety of practice problems spread across the text (and not always placed at the end of the text) keeps the interest of the students on the lesson while ensuring understanding of the concepts embedded in the text. In a sense, the workbook is inbuilt in the textbook.
- Integrated textbooks are being used in the lower grades of the primary schools in several states of our country. The EVS course of classes I and II has been integrated in the textbooks of Language and Mathematics developed by the NCERT. The EVS textbook of classes IV and V integrates Science and Social Science.

E4. State at least two differences between integrated and non-integrated text books

We have already discussed the materials to be used in learning and teaching process in Unit-6. There is no material which is specific to integrated learning. It is how we use the material. You have to think how a particular material can be used to help the children in acquiring different learning outcomes in different subjects. Let us take an example.

The material is '*soap with its wrapper*' which can be used for different purposes of learning and teaching as follows:

- *Language:*
 - Explanation about the use of soap,
 - Formation of words.
 - Identification of letters.
- *Mathematics:*
 - The price written on the wrapper of the soap can be used for the purpose of addition, subtraction, multiplication and division,
 - The explanation of M.R.P.(minimum retail price): What are retail and wholesale prices? How can profit or loss be calculated with M.R.P? etc.,
 - The shape of the cover can be used to describe cuboid,cube etc.,
- *General Science:*
 - What are the contents used to prepare the soap.
 - Distinguish between hard water and soft water with respect to the use of 'soap'.
- *Social Science:*
 - Place of production of soap.
 - Raw materials used to prepare soap.
 - Route and process of transportation.

**ACTIVITY-4**

Select any TLM from your surrounding and list out ways you can use it for teaching and learning different subjects.

**Notes****E5. Which one characteristic of the integrated textbook you consider to be most important?**

Give reasons for your answer.

Since, all our real life experiences are not compartmentalized into separate curricular subject areas, integrated approach to learning and teaching is most logical and most likely to lead to meaningful and holistic learning. Whether there is any integrated textbook available or not, it is the integrated approach to teaching and learning in and out of the classroom that makes the difference in quality of learning especially at the early stage of school learning.

9.6 LET US SUM UP

- Integrated learning refers to education that is organized in a meaningful and holistic manner by association of several related concepts drawn from different subject areas focusing on a broad theme which has real life significance for the learner.
- Integrated curriculum is of three types: associating the concepts and skills within same subject (Interdisciplinary), of different subjects (multidisciplinary and interdisciplinary) and beyond the subjects (Trans-disciplinary).
- Integration within one subject area or Interdisciplinary Integration is a process of integration where the knowledge and skills of same subject are connected together during the teaching learning process.
- Multidisciplinary and interdisciplinary integrations are processes (with finer differences) of integrating the knowledge and skills of two or more different subjects during the teaching and learning process.
- Trans-disciplinary integration helps in making learning more meaningful, contextual and more real life oriented while reinforcing the curricular learning outcomes, through acquiring more skills and competencies than planned.
- Integrated textbooks have unique features for encouraging and enhancing learning by associating various elements and activities.



9.7 MODEL ANSWERS TO CHECK YOUR PROGRESS

E1. Any three of the following:

- Combining related concepts from different subject areas.
- Developing teaching-learning on real life themes going beyond the textbook experiences.
- Combining different methods like projects, observation etc.
- Flexibility in time schedules and grouping students.

E2. Any two points from the Table 9.2

E3. You can develop your plan in which you may follow the steps as stated below:

- Selecting the project relating to life context
- Identify the related learning concepts and skills
- Planning activities to link the identified concepts and skills.
- Preparing time schedule and group formations for the transaction of activities.

E4. Between non-integrated and integrated textbooks

- The former is based on subject specific contents whereas the latter is based on real life themes/context/situation.
- The former is based on given knowledge/skill and the latter is based on the explorative knowledge/skill.
- There is no scope for learning activities within the text of the former whereas the latter is filled with learning activities.
- There is hardly any interactive space in the former while there are interactive spaces for one-to-one and group interactions in the latter.

9.8 SUGGESTED READINGS AND REFERENCES

- (i) Beane, James A. (1977). Curriculum Integration: Designing the Core of Democratic Education. New York: Teachers College Press.
- (ii) Drake, Susan M., and Burns, Rebecca C. (2004). Meeting standards through integrated curriculum. Alexandria, VA: ASCD.



- (iii) Humphreys, A., Post, T. and Ellis, A. (1981). *Interdisciplinary Methods: A thematic approach*. Santa Monica, CA: Goodyear Publishing Company.
- (iv) Jacobs, H. H. (1989). "Design Options for an Integrated Curriculum." In H. H. Jacobs(ed.) *Interdisciplinary curriculum: Design and implementation*, (pp.13-24). Alexandria, VA: ASCD.
- (v) Shoemaker, B. (1989). "Integrative Education: A Curriculum for the Twenty-First Century." *Oregon School Study Council*, 33(2).

9.9 UNIT END EXERCISES

1. What are the need of integrated curriculum and integrated teaching-learning process in the early classes of primary schools?
2. Describe briefly the different types of integrating curriculum and teaching learning processes highlighting their respective utility in classroom processes.
3. What type of textbook is more preferable for the beginners at the elementary level? Why?



UNIT10 CONTEXTUALIZING LEARNING PROCESSES FOR DISADVANTAGED LEARNERS

STRUCTURE

- 10.0 *Introduction*
- 10.1 *Learning Objectives*
- 10.2 *Socio-cultural Context of Learning*
 - 10.2.1 *Socio-cultural context for Meaningful Learning*
 - 10.2.2 *Local Knowledge and Textbook Knowledge*
- 10.3 *Education of the Disadvantaged Children*
 - 10.3.1 *Education of the Girls*
 - 10.3.2 *Education of Children of Minority Groups*
 - 10.3.3 *Education of the Children with Special Needs (CWSN)*
- 10.4 *Education of Tribal Children in Socio-cultural Contexts*
 - 10.4.1 *The Issues*
 - 10.4.2 *Strategies for Resolving Pedagogic Issues*
 - 10.4.3 *Understanding the Socio-Cultural Components*
 - 10.4.4 *Planning and Managing Multilingual Classroom*
- 10.5 *Let us Sum up*
- 10.6 *Model Answers to Check Your Progress*
- 10.7 *Suggested Readings and References*
- 10.8 *Unit-End Exercises*

10.0 INTRODUCTION

As a teacher while teaching in any class, you must have noticed that at any time all students in the class are not equally attentive and responsive to the interactions going on in the class. Some students take active participation in classroom



interactions while some other students remain shy and quiet and unless continually persuaded they rarely participate in classroom activities nor do they respond willingly. Why is this?

Well there are individual differences and every student is unique in his/her personality and dispositions. That is why their attention span, their learning styles and the response patterns are different. But who are these students who prefer to remain silent and aloof in the classroom activities? Are they the ones who have a feeling of inferiority, of being neglected, or of being discriminated?

There are of two categories of students who come with some disadvantages – children of socially disadvantaged groups and children with special needs. Generally children belonging to Scheduled Castes, Scheduled Tribes and Minority Groups are considered as socially disadvantaged while children with some physical and learning difficulties are the children with special needs (CWSN). Besides these two categories of children, the girls in general are also victims of social discrimination and neglect. The children from these categories come to school with a disadvantaged tag with them and as a result they become easy prey to differential treatments by the teacher and the classmates.

It is noticed that children coming from tribal communities do not feel comfortable in the classroom environment because the socio-cultural climate in which they are born and brought up is totally different from that of the classroom/ school. Such mismatch between the home and school environment puts these children in utter disadvantaged conditions and those who cannot overcome the disparities very often become victim of drop-out of the school.

In this unit let us understand the socio-cultural context of learning and its importance for facilitating learning of different categories of disadvantaged learners in the classroom. However education of tribal children has been focussed because of two prominent reasons. Scheduled tribes constitute a substantial portion of country's population and inhabit in most remote and inaccessible terrains having least awareness for schooling. Secondly, these children have different cultural and linguistic traditions which are distinctly different from other social groups. Their problems need to be given proper attention by properly understanding the unique nature of their educational needs conforming to their socio-economic-cultural and linguistic conditions. As a teacher you need to be aware of the problems of such categories of children in your classroom and be well equipped to address their difficulties in learning. In this unit such issues are discussed with specific methods so that these children like others can participate actively in all classroom transactions.

For completing this unit you shall need at least *07(seven) study hours*.



Notes

10.1 LEARNING OBJECTIVES

After completing this unit, you will be able to:

- Identify different local specific socio-cultural contexts of learning.
- Identify and deal with different categories of disadvantaged children in the classroom situation.
- Specify the issues related to the education of children of tribal communities.
- Use different strategies of learning conducive to the socio-cultural-linguistic conditions of tribal students.

10.2 SOCIO-CULTURAL CONTEXTS OF LEARNING

In learner-centred pedagogy importance is given to children's experiences, their voices, and their active participation in the learning and teaching processes. Therefore what do you think of the following:

- Should we treat the child in the classroom like an object devoid of any prior experience or treat him/her like any other human being with a lot of experience and a frame of mind shaped by the socio-economic-cultural conditions of the family and community?
- Should we just pour in the contents without considering the relevance and meaningfulness for the child learner or should we facilitate the children to shape their own learning by constructing and reconstructing their vast experiences already acquired against the constraints they faced in their real life situations like the socio-economic adversities, cultural taboos etc.?

The answer to these questions will determine the course of action that you would take as a teacher in the classroom transactions.

We know learning is active and social in character.... it must hence be based on children's local context and experiences. The teaching- learning process must respond to physical, social, and cultural preferences of the children.

Consider the following two classroom situations:



Notes

Situation 1: Mr. Raghu Mahanta, a teacher in a Primary School has to teach about “food” to the students of class IV. He entered the class room, quite well prepared with notes made in consultation with the textbook and other reference materials. He was very serious and without any fuss started teaching. He told about the need of food for living, gave several examples of different types of food, and using adequate TLMs elaborated how different food materials are procured, stored and used. In between he supervised the class notes of the students and also gave some home tasks. At the end he asked some questions and directed a few who raised their hands to respond. As a whole he engaged the class with a lot of dictation, elaboration and explanation but focusing his attention on a few students who seemed to be active.

Situation 2: Anita, the teacher in another primary school also has to teach the same topic “food” to the same class. She entered the class, talked with the students informally like ‘How do you feel today?’, ‘What have you taken in your lunch?’, ‘What are the materials used to prepare your food items?’, ‘Where were the food materials procured from?’, ‘Who prepares lunch for you?’... etc. Then she asked the students to make a list of food they take every day. When the students gave the names of food one by one, she wrote these down on the blackboard. Then she asked “Why do you take food? The students sat silently for a while and started talking...” ‘We take food to live.’ ‘We get energy from food’.....so many answers came from the students. What Ms. Anita did was that she inspired each child to participate. Then she wrote a question on the blackboard... ‘What will happen if we do not take food?’ Everybody wrote their own answer in their notebook. At that time Ms. Anita supervised the students’ work, gave clues for answer, and corrected the answer where needed. She also asked the students to state their answers and wrote the same on the blackboard

Comparing the above two situations which one you think is a better learning situation? Why?

Well in the first situation Mr Mohanta focused on teaching the concept without considering the student’s experience related to the concepts. He tried to discharge the knowledge of the concept into the mind of the children. He was concentrating on a few active students and did not seem to take care of other students who remained mostly inactive. It is rather teacher-centric. On the other hand, in the second situation, Ms. Anita tried to involve the students by consistently considering the experiences of the student while facilitating their learning. It is evident from the questions she posed before students that she was always conscious of the local contexts of students and did not try to impose any knowledge on the students.



Notes

When the learning is related to experiences of students and the context in which they are placed, when it is a product of student's thinking, when it is self-directed, when the student does something with his/her learning experience, it becomes meaningful.

10.2.1 Socio-Cultural Context for Meaningful Learning

According to NCF (2005):

“The child's community and local environment form the primary context in which learning takes place and in which knowledge acquires its significance. It is in interaction with the environment that the child constructs knowledge and derives meaning.” (p.30)

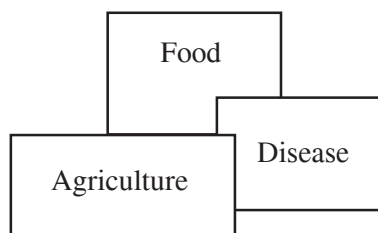
We cannot afford to neglect the conditions of family, locality and community in which the child is born and brought up for the following two essential reasons:

(i) the local environment provides facilitating conditions to the child to acquire immense experience, and (ii) constraints for education are created due to the socio-economic and cultural practices and beliefs of the family and the community.

Facilitating Conditions:

Children gather variety of experiences from the interactions with their socio-cultural environment. They learn from the trees around them, from the animals and birds they have seen, friends they have played with, family members with whom they live etc. That means their mind is not a clean slate when they enter the school. Basing on these experiences, we have to enhance their learning by linking their existing experiences with new knowledge given in the textbook.

Let us understand how meaningful learning takes place. See the diagram given below and think.



When a child learns about food, he/she links the concept “food” with his experiences on types of food he/she eats every day, process of food preparation. He/she also links with agriculture, health, diseases etc. Here the brain stores those experiences together. When one concept is recalled, the other concepts are



recalled simultaneously with his experiences. In other words, recalling the concept of ‘food’ activates the child’s brain for other concepts to be linked. In this case learning is meaningful because child gets a chance to use all his/her experiences acquired through the continuous interaction with the immediate environment. In that sense, the local environment provides facilitating contexts for learning.

Constraining Conditions:

The social, economic and cultural conditions prevailing in a community also create hindrances for the education of children. There are communities with affluent conditions who have extreme conservative notions for education of the girl child. Extreme form of poverty forces families to engage their children in earning livelihood rather than sending them to schools. Similarly, due to social and religious taboos, some communities do not like to send their girl children to co-education schools to study along with boys. In some societies where caste system is still rigidly followed, the families of the so called upper castes do not prefer their children to sit or interact with those from the Dalit families who are still considered untouchables in several regions of our country. Tribal children, notwithstanding their rich and diverse cultural heritage, are looked down upon for their abysmal poverty and difficulty in communication because of language. Such a list of constraints is endless.

However, here are some suggestions for facilitating meaningful learning taking into consideration the socio-cultural contexts of the child:

- **Use of child’s knowledge as the base for learning:** Suppose you have to teach ‘sources of water’. The text book tells that dug wells, tube wells, rivers are the different sources of water. In your area the pupils have not seen any of these sources of water. They have seen pond, stream, jheel, and/or canal etc. So you have to start your lesson with these sources of water.
- **Make your classroom situation contextual:** Whenever you are in the classroom and whatever you are teaching, take examples from local environment, tells local stories, collect the TLMs from locality, gather student’s knowledge and share with them in their local language/dialect. If you do this, your classroom activities will be meaningful for the students.
- **Use materials available in your locality:** While teaching, normally you use the pictures given in the text book. Perhaps, you forget that these pictures are given as examples. So when you are facilitating learning collect and prepare local specific materials. If you are teaching vegetation in Geography, collect the plants and names of trees from the locality and start your teaching from local vegetation.
- **Ensure students’ active participation:** Students become active when they are involved in learning and teaching processes, which means they get scope to ask questions, argue, discuss, share their ideas, give examples of their



Notes

own, explain and elaborate and also use TLM during learning. So as a facilitator you have to create scope for students' participation without giving long lecture, loud elaboration and much dictation.

- **Cite examples by going beyond the text book:** Suppose you have to teach 'addition' to class II students. See the examples given in the text book and try to understand the purpose. While facilitating learning, do not cite these examples. Give examples on how they add different things in their day to day life and link them with the learning of the concept. Through this approach you can use children's experiences going beyond the textbook.
- **Encourage students to ask question and argue:** Giving scope to ask question means you are activating the students. If they ask questions, they will think on and about the concept to be taught and will argue. When they argue they get scope to understand what they are telling. If this happens in your classroom, it can be concluded that students are learning meaningfully.
- **Focus on 'learning as a process' not on 'learning outcomes':** While facilitating learning, do not focus much on 'what they learn' rather focus on 'how they are learning' As there is no absolute right or wrong knowledge in this world, so do not give or dictate answers to the students.

Whether formal or informal, use of children's experiences brings out meaningful learning. Unless children localise their day to day experiences while learning a concept, knowledge is reduced to mere information. We know that learning from the text is pointless unless it is connected with the context. We have to focus on children's active participation in our learning teaching process so that they share their own experiences and sharpen their concepts introduced through curriculum.

E1. What are the major characteristics of meaningful learning?

10.2.2 Local Knowledge and Text Book Knowledge

The knowledge, information, examples about different concepts given in the textbook is called textbook knowledge. But child's community and local environment forms the primary context in which learning takes place. He/she interact with the environment, derive meaning and construct knowledge which becomes the base for further learning. This is what we call local knowledge for the children. This is not usually taken care of in preparation of text books and in learning-teaching process. When a textbook is prepared for the whole state, it is difficult to bring the local knowledge of each area and community into the text book. It is also not possible to take into account the varieties in our socio-cultural life. But children need to find examples of their own socio-cultural environment. Here the teacher plays an important role. Let's see how a teacher can contextualize the text book knowledge.



- ***Detailed reading of the Text Book.***

Many a time teachers enter the class and start teaching. Hardly have they referred to the text book beforehand. As a result they face problem to interpret the text book knowledge in the context of children's learning. To contextualize the text book knowledge for the students, the teachers have to read the text book again and again so as to identify plug points to cite local examples.

- ***Finding the learning indicators from the text book***

If a teacher picks up the learning indicators from the text book, he/she will be able to design meaningful activities for the children. The activities given in the textbook serve as examples only and can help the teacher to find the learning indicators. When a teacher understands the purpose of these activities, he/she will get the learning indicators. For example, in an English text book of Class V, some speeches in direct and indirect forms are given in a topic. Here, the purpose is to make the child speak. A teacher can arrange conversation between/among the students to develop this indicator. An indicator refers to what the child does after learning a concept.

- ***Gathering the students' knowledge on different learning points***

When the teacher finds the learning indicators, he/she has to gather related local knowledge to fit in. He / She can get this knowledge from the students, other teachers, community people etc.

- ***Linking children's knowledge / experiences with text book knowledge***

When a teacher knows students' experiences related to a concept, he/she has to establish a link between student's experiences and text book knowledge. For the purpose the teacher has to make note of student's experiences for each learning indicators. For example the concept of food preparation may be different in rural and tribal areas.

- ***Preparing own text if needed (alternative text).***

Many a times a text may not be appropriate for the student. So to make it meaningful for the students, a teacher has to prepare alternative text taking students' socio cultural context into account. For example, 'Road accident' is an urban phenomenon. We cannot ask students from rural areas to write an essay on 'Road accident'.

By relying only on textbook and underestimating the experiences of children acquired from local sources, you as a teacher are creating two mistakes. First, you are encouraging rote learning, because most of the textbook experiences are not to the context and not easily comprehensible for the children. Second, you are discriminating children strong in rote memory and getting the texts by heart



Notes

in no time from those who rely heavily on their local experiences. Usually the former are given favourable recognition and the latter are labelled as slow learners. Thus disadvantaged conditions and disadvantaged learners are sometimes created within the confines of the classroom.

10.3 EDUCATION OF THE DISADVANTAGED CHILDREN

As mentioned earlier, girls, children of minority groups, SC children and children with special needs (CWSN) are considered as disadvantaged children. Let us understand them:

10.3.1 Education of the Girls

All of us know about the neglect of girl child in general and the undesirable attitude that many have towards their education in particular. Both in the family and community and at the school, the education of the girls is usually not taken very seriously. Such endemic neglect can be found in any part of our country irrespective of the financial status of the family. Nearly half of the child population and potential future mothers are given casual treatment so far as the basic and foundation education is concerned.

Why Girls' Education is Important?

“By educating a boy, an individual is educated. But, when a girl is educated, a generation is educated”so goes a proverb which captures the importance of girls' education. Besides educating half of the child population, girls' education has more return in real terms as pointed below:

- ***Towards women empowerment:*** In recent times, women, throughout the world, have attained excellence in every human endeavour. Having access to proper education, women have achieved at par with men and even have excelled in many fields. To aim at such women empowerment, education is the key and early education of the girls provides the base for it.
- ***Education and efficiency in working place:*** It has been observed female education influences in increasing the amount of time that women work. But in case of men, education has little influence on their quantity of work. This phenomenon is also visible in schools where the girls, in average, like to spend more time on study and given a little encouragement they outperform the boys.
- ***Removal of gender inequality:*** Education of girls leads to empowerment and thus reduces iniquitous status of girls and women otherwise given a lower position in the family and in the workplaces.



- **Family health and education:** Health of family members is better taken care of by an educated mother so also is the education of children in the family. Even girls in primary schools can bring about transformation in the maintaining a cleaner home environment and developing healthy habits of the family members.
- **Improved child care:** When a girl is educated, she not only becomes a good mother in future, but can take better care of children in the family.
- **Fertility rate and economic growth:** Research studies have shown that the decline in fertility rates is directly associated with the level of girls' education. That means the higher is the level of education of girls the lower is the rate of child birth. And the society with lower fertility rate has higher economic growth. On the other hand, boys' education levels have no direct association with fertility level in general.

Issues of girls' education in schools:

While the apathy towards girl child's education begins in the family, it also continues in different forms in the school and classroom.

- **Access and Enrolment:** Opportunity of having a school nearer to the habitation of a child is still lacking in remote rural areas and in hilly terrains. Families do not like to send the girls to a school situated at a distant place or if the approach to the school is considered unsafe either due to difficult geographical conditions (like hilly track, water bodies, forest, uneven land forms etc) or due to presence of unsocial elements on the way to school. Establishment of a neighbourhood school within one kilometre of child's habitation, as per the provision of the Right to Education Act 2009, might solve the problem to a large extent. But, in spite of it, there are quite a large number of scattered and small habitations, particularly in tribal and hilly areas, where the access would continue to be problematic. To meet this challenge, the idea of residential schools for such children is being proposed.

Enrolment of girls in the primary schools has improved considerably during the last decade due to the persistent efforts made through the SSA in all states of the country. But, the enrolment of girls across the states lags behind those of the boys. The reasons for this phenomenon are many like, engaging girls in domestic chores, taking care of younger siblings, or because of lack of awareness of the utility of education of girls. All these can be attributed to the general apathy towards girls' education.

- **Unfavourable School Climate:** While several infrastructure inadequacies like lack of required number of classrooms, small and crowded classrooms, rooms without adequate light, and absence of toilet and drinking water facilities create uncomfortable situation for all learners, both boys and girls, lack of separate toilet and water facilities are considered most unfavourable



Notes

conditions for girl students in the school. It has been observed that the schools without these facilities have poor retention rates of girls.

Usually the girls feel freer to interact with female teachers than with male teachers. Shortage of female teachers in the school curbs the free interaction of the girl students. As a result the girl students feel constrained to clarify their doubts and solve their problems in the school.

- ***Discriminatory Practices:*** Try to reflect upon the treatment that we give to the girl students in the classroom and school. The following may sound familiar..
 - Knowingly or unknowingly we usually give less attention to the girls' education and other problems they face in the school and classroom. In the class room, the girls sit separately away from the boys. In group work, girls sit in separate groups; girls are not engaged to perform learning activities as frequently as boys in the classroom; the girls are asked less number of questions than boys during the classroom interaction.
 - It is a general practice in the schools to assign gender stereotype roles to girls and boys which are gender discriminatory. For example, the boys are given to play football, cricket whereas girls play games like ludo, skipping etc. Girls are engaged in less physically difficult activities and more in indoor activities and games like cleaning the floors, decorating the classroom, knitting, stitching and preparing toys etc. whereas boys are engaged in more physically challenging and outdoor tasks like doing errands, carrying heavier things, working in the garden etc.
 - While we do not take seriously to a boy talking in a loud voice, we caution a girl not to speak loudly. The smartness of a boy is praised whereas a girl showing similar smartness is not appreciated.
- ***Discriminatory provisions in textbooks:*** The language, pictures and examples used in the textbooks very often depict a lower status of women which can instil a sense of inferiority among the girls from the beginning of the school education. Let us look at some samples of such discriminating materials:
 - In textbooks, you often find that not much attention is given on the issues of girls/women, or on the achievements of prominent women in different public or professional fields.
 - In the EVS textbook the topic on 'Family' highlights contrasting role of father and mother. The father is the earning member and the mother's role is confined to housekeeping.



- The picture in the same topic shows father relaxing with a newspaper and the mother is cooking.
- In the topic 'Time and Work' in class V Mathematics textbook, we come across statements like, "*Two women can perform same amount of work on a single day what one man can do on the same day*", "*A man earns Rs. 100.00 per day whereas a woman earns Rs.60.00 per day for the same amount of work*". Similar statements underestimating women's status can be found in many problems in Mathematics text books. Although such statements are neither connected with mathematical concepts nor have been given with any ulterior intention, they reflect our gender biases which are transmitted to the young learners inadvertently.
- In Language, and Social Studies also you come across such discriminatory materials very often.

Recognizing such adverse depiction of women's roles in the textbooks, several corrective measures are now being taken to remove them.

- ***Myths about learning performances:*** There are several common beliefs about girls' learning achievements. Some such beliefs are:
 - Girls are poor achievers than the boys at any age or grade level.
 - Girls are poor performers in Mathematics at any level than boys.
 - Girls perform better in Language, Literature and Poetry than boys.
 - Girls are better in verbal fluency, and artistic/aesthetic sensibilities, whereas boys are better in mathematical reasoning, and physical-motor abilities.



ACTIVITY 1.

As observed by you, write down the points of gender discrimination in the textual materials and classroom transaction made by a teacher.

If we start teaching with such conceptions in our mind, then we would be discriminating the girls in the classroom and school activities. Research studies on these issues conducted throughout the world have not confirmed such beliefs. On the contrary, it has been observed that girls who regularly attend the school (with more than 95% of attendance) perform better than boys in every subject. This is noticeable in recent times from the numbers of top positions in nearly all common examinations occupied by the girls.

What can you do to promote girls' education in your school?



Notes

Contextualizing Learning Processes for Disadvantaged Learners

You have two fold duty in this respect:

- Firstly, bringing all girls of school going age (i.e. in the 6-14 age group) in the schools and ensuring regular attending of the classes till the completion of elementary education;
- Secondly, making provisions in the classroom and school for improving quality of girls' education. The main aim of such efforts would be to provide adequate girl-friendly environment in the school, enhance their self-esteem, self-confidence and self-reliance, removing any social stigma and gender stereotype roles, removing any gender bias from the textbooks and learning materials, making classroom interactions and activities free from any sort of gender bias.

You can take several steps in this regard in your schools. Given below are some suggested action points for attaining the above mentioned objectives:

- *Community Mobilization:* Continuous interaction with parents, especially mothers, is to be made for the enrolment, regular attendance and performance of girl children. The members of the school managing committee, mother-teacher association, self-help groups and other opinion makers should be sensitized for mobilizing communities in favour of girls' education in their respective schools. In this direction you should take the initiative first.
- *Ensuring separate toilets for girls:* Using available funds from Sarva Shiksha Abhiyan (SSA), separate toilets need to be constructed. You must see that the girls use it properly following all sanitary habits. This not only helps in regular attendance of the girl children, it also develops sound sanitation habits in them which they also carry to their families.
- *Availability of incentives in time:* Girls in schools are being provided with several incentives like free school uniforms, free textbooks and free reading and writing materials from the SSA funds. You need to ensure that these incentives reach them on time.
- *Involving girls in all activities:* You need to specifically ensure the participation of girls in all types of activities conducted in schools. No activity should be specifically marked only for boys or only for girls.
- *More group learning:* You must create more scopes for group and peer learning in which girls can participate without any restriction. Such free and purposeful group interactions help in minimizing gender discrimination in the classroom.
- *Bias-free classroom interactions:* During classroom transactions you must distribute your questions nearly in equal manner among boys and girls, consciously avoid giving any discriminatory remarks to girls, and encourage them for better performance.



- *Bias-free learning assessment:* You need not attach any bias or discrimination while assessing the learning progress of girls. The girls should not have any feeling of unfairness in assessment of their performance. You may encourage peer assessment as a part of formative assessment in which every child including the girl child feels free to assess others and herself simultaneously thus getting motivated to improve her performance.

E2. State the two main obstacles for girls' education in your area. Suggest methods to overcome these obstacles.

Girls' Education in Sarva Shiksha Abhiyan (SSA)

Girls' education is one of the major interventions of SSA. It recognizes that reaching out to the girl child is central to the efforts to universalize elementary education. SSA's focus on gender parity is rooted in the National Policy on Education (NPE) 1986/92 and the Programme of Action (POA), which brought in centre-stage the issue of gender and girls' education. More importantly, it linked education of women and girls to their empowerment. NPE states that education should be a transformative force, build women's self-confidence, and improve their position in society and challenge inequalities.

SSA envisages bringing all children including the girls within the age group of 6-14 years into the folds of schools and ensuring their completion of elementary education. It further aims at bridging all gaps due to gender considerations in enrolment, retention and achievement. The efforts included several strategies such as mobilization of community, strengthening mothers' involvement in school activities, provision of free incentives to girl students in terms of school uniform, textbooks, reading and writing materials and residential schooling facilities in selected areas. In order to increase access to education, there are some special programmes for Girls under SSA as given below.

Special Schemes for Girls under SSA

a) *National Programme for Education of Girls at Elementary Level (NPEGEL)*

NPEGEL is a separate, gender-distinct but integral component of SSA meant for "most difficult to reach" girls, which provides additional support for enhancing girls' education over and above the investments for girls' education through normal SSA interventions.

NPEGEL is implemented in:

- Educationally Backward Blocks (EBBs) where the level of rural female literacy is less than the national average and the gender gap in literacy is above the national average;



Notes

- Blocks of districts which are not covered under EBBs but have at least 5% SC/ST population and where SC/ST female literacy is below 10%; and
- Selected urban slums.

NPEGEL aims at enrolment of all girls in the area, reducing dropout rates among girl students, providing life skills to the girl students and an intensive community mobilization for girls' enrolment, and retention.

b) Kasturba Gandhi Balika Vidyalaya (KGBV)

KGBV provides for setting up residential schools at the upper primary level for girls belonging predominantly to the SC, ST, OBC and minority communities. KGBVs are set up in:

- educationally backward blocks, where the female rural literacy is below 30%,
- urban areas with female literacy less than the national female literacy (urban)
- minority dominated areas.

Such residential schools are set up only in those educationally backward blocks which do not have residential schools at the upper primary level for girls under any other scheme.

KGBV scheme is intended to bring about all round development of the girls belonging to the most deprived sections of society. It also integrates vocational elements to the prescribed curricular provisions. All the costs of the students in these residential schools are borne by SSA. There is close convergence between different agencies and government departments for sound implementation of the programme.



ACTIVITY 2

Prepare a report of progress of NPEGEL programmes in your district in respect of the objectives of the programmes.

10.3.2 Education of Children of Minority Groups

Several children come from minority communities in the school. These minority communities may be broadly of three types - (i) *Linguistic Minority*, (ii) *Religious Minority*, and (iii) *Ethnic/Racial Minority*. Given below are some examples.

- Nilanjana is studying in a primary school in Madurai in Tamil Nadu. Although her mother tongue is Bengali, she has to interact in Tamil medium of



instruction in her school. She is from a Bengali speaking community in Madurai where this community can be termed as a *linguistic minority* community.

- Salman is a student of class III in a school in Puri. He hails from the Muslim community which is considered as *religious minority* group in Puri where Hindus constitute the dominant population.
- Soren from Santhali tribe in Mayurbhanj in Odisha studies in a Government Primary School in Baripada Town. Although, Soren is a native of Odisha, he belongs to a racial/ethnic minority group like other tribal groups having distinct socio-cultural identity.

What are the problems of these three children in their respective classrooms?

- Due to the gap in her home and school language, Nilanjana has difficulty in understanding the classroom interaction and the textbook language. She also has problems in expressing her feelings in Tamil which is not her mother tongue. Not only in the classroom and school but also everywhere in the locality she faces difficulty in interacting in the local language. She feels herself to be an outcast in the locality and feels to be discriminated in the classroom.
- Salman, does not problem with the language of interaction. Although he speaks in Urdu in his home and his Muslim community, he is also equally fluent in Odia, the language of the majority in Puri. He is a bilingual. But his problem lies in the religious practices and his identity linked with his religion. During festivities, celebrations and performing several co-curricular activities he feels isolated from his classmates and thus feels discriminated. This feeling of being discriminated is carried over to other situations in daily life and even to the classroom interactions.
- Being a child of a tribal community, Soren has distinct ethnic identification which sets him apart from others in the classroom. The problems and prospects of tribal children will be discussed in the next section of this unit.

Why education of the minority group is so important?

This is important from the following point of view:

- **Equality of opportunity:** Every child need to have equal opportunity for education especially for elementary education which has been accorded as a fundamental right in our Constitution (see the box below) and further emphasized in the Right to Education Act, 2009. Equality of opportunity usually stresses the opportunity for access to schooling provision. Every child, irrespective of his/her caste, race, religion or any other disabling factors, should have opportunity of access to schooling without any form of discrimination failing which we shall be depriving these children their fundamental right for education.



Notes

Contextualizing Learning Processes for Disadvantaged Learners

- ***Non-discriminatory treatment:*** Except in specific areas, children of the minority groups are much less in number in the normal schools/classrooms. Because of their minority tags like language, religion, and physical handicaps, they feel isolated because of being subjected to discriminatory practices by the teacher or the peer groups. The discriminatory practices include different forms of treatment like making separate seating arrangements, restricting participation in several activities, giving derogatory remarks, not using their home language etc. Therefore, it is imperative for the teachers to ensure that these children are not subjected to any form of discrimination in the classroom activities or school activities.
- ***Respect for the composite culture:*** India is a nation where various cultures have coexisted and have developed through mutual interaction and respect for each other. The respect for different culture and tolerance for others' viewpoints have to be cultivated in the school in the early training of children.
- ***Diversity in the social system:*** Each society in our country is characterized by diversity. Even the habitations nearby the school are inhabited by several communities marked by diversity in income, vocations, customs and rituals. This diversity is also reflected in our classrooms where children from different communities participate and interact in equal terms in course of various activities. Activities conducted in classrooms and schools need to incorporate the identity of these typical elements of each community so that children from very early stage regard the diversity as an asset.
- ***Inclusive learning environment:*** As a teacher you need to create an inclusive learning environment by considering all equally. Note what the Constitution has to say.

What does the Constitution say about the Rights of the Minority Groups?

- Article 15 and 19 dealing with Fundamental Rights speak of prohibition of discrimination on the grounds of religion, race, caste, sex, and place of birth or any of them and guarantees equality of opportunity for all citizens in matters relating to employment.
- Article 29 and 30 focus on protection of rights of the minorities as regards language, script, culture and establishment and administration of educational institution.
- Article 350 (A) seeks to provide facilities for instruction in mother-tongue at primary stage.

Now let us discuss the measures to be taken for minority education.



Education of Children of Linguistic Minority Groups

Some of the steps that can be taken at the school level for facilitating education of children belonging to linguistic minority groups are:

- *Schools for children of linguistic minority groups:* Separate schools in the areas where linguistic minority groups are concentrated or residential schools for such children where more such children could be available.
- *Provisions of textbooks and reading materials:* The primary requirement of the children of linguistic minority groups is the textbooks and other reading materials. Timely supply of these materials has always been a problem as in some states textbooks in languages other than the main language of the state are not developed because of several constraints.

Another problem regarding the textbooks in some schools is the non-availability of textbooks in subjects other than the language textbooks in the home language of such children. That means such a child has to read the textbooks in mathematics, social science and science written in the major language of the state. This can be managed by making arrangements with other states where the textbooks and other reading materials are available in the concerned language.

- *Engagement of language teachers:* Presence of a teacher interacting in the home language of the children removes the feeling of isolation of such children to a large extent. Engaging teacher specifically in the minority language would be a positive step for facilitating the learning of such children. If any qualified persons are not available, then at least one teacher of the school may be trained in the minority language and culture for dealing with these children in the school.
- *Participation in multi-lingual activities:* Several occasions can be arranged in the school in which the children can be encouraged to present activities in different languages. For example, singing patriotic songs in different languages on important days like Independence Day, Republic Day, and National Integration Day. All the children in the school can be encouraged to enact plays, sing songs, participate in riddles and puzzles in both languages. Participation in such multilingual activities by all children in the class/school shall develop friendship among the children and reduce the sense of isolation of the children belonging to language minority groups.
- *Scope for Assessment in minority language:* In an informal way the teacher can use both the languages of majority and minority in asking questions/tasks during classroom transactions. In the formal assessment situations, questions and tasks in the minority languages should be used so that minority children do not feel difficulty in performing because of language difficulties.



Education of Children of Religious Minority Groups

Ours is a secular country where every religious practices are given utmost respect and our Constitution provides that '*all persons are equally entitled to freedom of conscience and the right to freely profess, practice and propagate religion*' (Article 25). In spite of it, due to several reasons like blind beliefs, communal rivalry, extreme poverty of the minority groups, the children belonging to the religious minority groups continue to be the backward groups as far as school education is concerned. Therefore, they need special attention for improving their educational status in schools. Following aspects need to be taken care of by the state, school and the teachers:

- *Provision of access:* According to the constitutional provision (Article 29(2)), no educational institution sustained by the State or receiving aid out of State funds can deny admission to anyone on grounds of religion, race, caste, language or any of them. The RTE Act also highlights this.
- *Modernizing religious educational institutions:* Educational institutions for children of religious groups stress on religious texts and teachings. Without sufficient exposure to the scientific and technological advances, students in these schools are likely to become more dogmatic and lack a holistic view of life. Moreover, they are deprived of several experiences that would help them to pursue higher learning and enabling them for wider choice in professions. It is now widely felt that these institutions need to be modernized so as to provide all possible opportunities to these children besides the religious education.
- *Integration in school activities:* In a normal school, different aspects of the minority culture can be integrated in different school activities so as to bring these children to the mainstream of the school education. Some such action points are:
 - *Respecting religious practices:* It is now a normal practice in all schools to close on the occasions of the important days of different religions in our country. This could be supplemented with discussion of the importance of such days and celebrations which would instil a sense of respect of each student toward the religion other than his/her own.
 - *Ensuring equal participation in school activities:* The sense of isolation within the children of the religious minority groups would be minimized by ensuring their equal participation in all forms of school activities.
 - *Provision of special coaching for backward children:* Since most of such children come from extremely poor background, provision may be made for special coaching of such backward children of minority communities.



- *Facilitating classroom activities:* Removing all possible sources of discriminating these children during classroom transactions is needed and for that the following few action points may be kept in mind.
 - *Ensuring participation in group activities:* Involvement in group activities in the class enhance peer interaction and strengthen group cohesion thus decreasing discrimination and stops others in giving derogatory remarks.
 - *Removing discrimination in learning materials:* Pictures, models, some text materials that create ill feelings among children of religious minority community should be removed from display and use. Nothing that causes disharmony should be allowed in the classroom transaction.
 - *Addressing language issue:* Children from Muslim families use Urdu language as their mother tongue. If there is an Urdu knowing teacher in the school, Muslim children would be benefited. If such teachers are not available, then some teachers of the school may be trained to at least speak working Urdu to instil confidence among the children. Such children may be encouraged to participate in co-curricular activities like singing songs and enacting with dialogues in Urdu.
- *Orientation of teachers, head teachers and educational administrators:* Short term orientations on how to facilitate the learning of children of religious minority groups and to protect them from any discriminatory treatments need to be given to the teachers and administrators.

As a teacher you can play a major role in the education of the children of minority community. If you don't belong to such a community you may have difficulty in understanding and motivating such children. Once you try to understand their dialect, language, cultural and religious background you can communicate effectively with these students and you can adapt the curriculum and instruction to their needs.

E3. What is the method of removing the sense of isolation of the children of minority groups in the classroom?

10.3.3 Education of the Children with Special Needs (CWSN)

A group that forms a very important part of equity issue at the elementary level is the Children with Special Needs (CWSN). You may have encountered in your classroom children with mild disabilities like loco-motor disability, visual impairment, hearing impairment, lower level of intellectual functioning and deficits in adaptive behaviour. As a teacher, you have to deal with these children to improve their learning and performance along with other children in the



Notes

classroom. Given below in Table 1 are the categories and identifying features of CWSE.

Table 1: Category and Identifying features of CWSN

Category of CWSN	Identifying Features
Loco-motor Impaired	Observable deformity in several limbs like hands, legs, neck, waist, and fingers. They may find difficulty in sitting, moving around, carrying or moving objects.
Visually Impaired	Observable deformity in the eye(s), Rubs eyes frequently, Frequent reddening of eyes, Covers one eye and tilts the head forward, Holds objects including the book close to his eyes, Asks other children for help when taking notes from the blackboard, Blinks frequently, Watery eyes, Complains about headache following close eye work, Bumps into people or objects.
Hearing and Speech Impaired	Has observable deformity of the ear(s), Frequent discharge from the ear(s), Complains of pain in ears frequently, Scratches ear(s) frequently, Turns head on one side to hear better, Frequently requests teachers to repeat directions/ instructions/questions, Makes many errors in taking dictation, While listening to the teacher watches his face carefully, Displays speech difficulty.
Learning Disabled	Displays poor academic achievement, Forgets learning after a short time, Is inattentive and distracted, Shows too much reliance on presentation of concrete objects, Has poor self-image, Lacks in self-confidence, Seeks repetition and practice, When the child is asked to do something, h/she seems to have a problem in understanding what he/she has been asked, Appears dull or slow in mannerisms, Difficulty in learning to do things, Difficulty in understanding abstract things, Overdependence on concrete examples/ objects.

ACTIVITY 3

Considering the identifying features of CWSN, list the actions to be taken for improving the learning and performance of the CWSN.



Notes

The first step in dealing with the CWSN is to identify them properly along with the degree of disability. The teacher has to probe the problems of such children through proper medical check-up, testing and through observation of their behavioural characteristics. Once these children are identified, they are referred to appropriate persons/agencies to undergo a cure for their disability. For example, children with hearing problem may require medical treatment and may require correction (hearing aid) in order to overcome the disability. A child with visual problem may require lens or a magnifying glass. A child with loco-motor disability may require crutches or a wheel-chair to move around or some mechanism for adjustment of hands for writing.

The curative and corrective measures are accompanied by adjustment in curriculum and classroom transaction with the objective of making the curriculum accessible to such children as to the other children. The provisions that can be made in the classroom/school to promote learning of such children are as follows.

- **Children with Loco-motor Impairment:** They have learning capability like other children. However, they may have difficulties in some learning activities. These children also develop adjustment problems because of non-acceptance or ridicule by their peers. In cooperation with the parents of the child, you may arrange to provide relevant aid for mobility of the limbs and functioning of the extremities. These services are available with the District Rehabilitation Centres. These can also be obtained from hospitals and primary health centres. You need to take care of such children on the following points during the classroom transaction:
 - It is essential that you accept such children in your class ensuring that no critical comment on their disabilities is given by anybody in the class.
 - He/she should be involved in all learning activities as an equal partner with his/her peers. It may be ensured that, they have adequate opportunities to participate in games, physical activities and recreational activities at their level of functioning.
 - In classroom, suitable adjustments in view of the disability may be made in seating arrangements. The arrangement need to be such as not to create any physical hindrance to the child.
 - In the assessment of performance of these children, particularly for grading or marking, their disability needs to be given due consideration.



Notes

Contextualizing Learning Processes for Disadvantaged Learners

For example, if they have difficulty in writing, they may be provided with extra time and, if necessary, oral testing may be used. In some areas they can record their answers on an audio cassette.

- **Children with Visual Impairment:** These children are identified easily. There are also partially sighted children. The vision of some of these children can be corrected through lens. But some can read only large print outs. Some may require magnifying glasses to read. Some children may have a restricted field of vision. It is necessary to identify such children, refer them to the hospital for an eye check-up, inform the parents and provide special help as mentioned below towards their education.
 - You need to adjust such children in front rows so that they can read from the blackboard with ease.
 - You need to write in bold letters which are legible and read aloud what you are writing on the blackboard.
 - In order to reduce the reading load on the child with visual problems, such children may be given training in listening with comprehension. They may be provided in the time schedule for a radio broadcast and encouraged to listen. Wherever facilities are available, audio cassettes may be used.
 - Opportunities need to be provided to them for participation in physical education programmes. A bookstand may be arranged for the partially sighted children.
- **Children with Hearing and Speech Impairment:** Some children have hearing difficulties and some have difficulty in speaking. Children with hearing problems may also develop speech problems. It is, therefore, desirable to identify such children and take steps to meet their educational needs.
 - Children with hearing problems should be seated in the front row so that they can listen what you speak with ease.
 - You need to use a reasonable level of pitch while speaking. Avoid mumbling and speaking too fast.
 - While you are demonstrating model or reading from the textbook, ensure that your lip movements are visible to such children so that they may be able to supplement listening by lip-reading.
 - Similarly when speaking while writing on the blackboard, you should face the students rather than speak with face towards the blackboard. For the same reason, you may avoid moving while speaking.
 - Peers may be encouraged to interact with these children and help one another in listening.



- Additional visuals, individually or in groups, may be used to supplement general teaching input.
- If speech disorder is due to an organic defect in the speech mechanism, medical help is required. Speech defects arising out of hearing problems can be corrected through speech training, using reinforced drill and practice.
- ***Children with Learning Disability:*** Identification of specific learning disabilities requires extensive training and educational provisions can be made appropriate to the type and level of learning difficulty. However, some common and practical steps you can take to help such children in your class are as follows.
 - You have to provide more concrete experiences for these children. These experiences can be provided by available standard or improvised materials. Direct experiences from the local environment may be provided through field trips.
 - These children require repetition and practice more than other normal children.
 - The learning task has to be presented in small steps and their attention needs to be drawn to important points of the learning task because they have comparatively very small attention span.
 - While they are engaged in learning, simple questions may be asked to give them a feeling of success.
 - Immediate reward in terms of verbal or material reinforcements should be the watchword for these children.
 - These children need to be provided with training on communication skills through practice in social situations.
 - Curriculum for these children has to be transacted through simple and interesting learning experiences.
- **Inclusive Education in the perspective of Sarva Shiksha Abhiyan (SSA) and Right of Children to Free and Compulsory Education (RCFCE)**

One of the major thrusts of SSA is to provide inclusive education to all children with special needs in general schools. SSA ensures that every child with special needs, irrespective of the kind, category and degree of disability, is provided quality inclusive education in the general schools along with the normal children. It also supports a wide range of approaches, options and strategies for education of children with special needs. This includes special training, in the form of school readiness programmes for CWSN, education



Notes

through special schools, home schooling and community based rehabilitation (CBR). The ultimate aim would be to mainstream all CWSN in neighbourhood schools.

E4. State any two reasons in favour of providing inclusive education for CWSN.

E5. State any two common actions that you can take in the classroom for facilitating learning of partially hearing and visually impaired children.

10.4 EDUCATION OF TRIBAL CHILDREN IN THEIR SOCIO-CULTURAL CONTEXTS

Among the disadvantaged learners, children of Scheduled Tribes often face difficulties because of their social, ethnic, economic and cultural differences. There are many the issues relating to their education which is discussed in this section.

10.4.1 The Issues

Since Independence, several efforts have been made for the overall development leading to the mainstreaming of tribal people. Still the problems of tribal people continue to be a matter of concern. Let's see some facts about the education of the tribal children in India.

- **Low literacy rate:** The Indian census 2001 reveals that the tribal literacy rate is low and in case of tribal girls it is still worse.
- **Low intake and high drop outs:** In schools enrolment of tribal children is low in comparison to other group and even before completion of elementary education, more than half of the enrolled tribal children drop out of the school without completing the elementary school education.
- **Low levels of comprehension:** Generally the school language is completely different from the home language of the tribal children due to which they find difficulty in understanding the classroom transaction and the language of the textbooks. As a result they exhibit very low levels of listening- and reading comprehension and their ability to communicate with others is also not very well developed.
- **Low achievement level:** Nearly all the achievement surveys conducted so far indicates extremely low level of achievement of tribal children and in particular the tribal girls. Tribal children not only score less marks in subject areas but also fail to gain life skills during schooling.



Notes

- **Experience of failure, and low self-esteem:** Continuously demonstrating poor performance, the tribal children lose their self-confidence and develop low self-esteem.
- **More disadvantages for the girls:** Tribal girls are more disadvantaged. They have to do household works as well as take care of their younger brothers and sisters in their home.



ACTIVITY 4

List the possible causes of low literacy, high dropout, and low self-esteem among tribal children in your State.

Some of the major causes for such poor status of education of tribal children are as follows:

- **Lack of family awareness and support:** Most of the tribal children coming to school are *first generation learners*. That means none of the elders in the family has ever gone to school. As a result they are illiterate and living in far distant and remote areas. They are totally unaware of the necessity of school education and cannot provide any support to the child in the school/ In most cases they do not show any interest in their child's education. Even those who are now showing interest in their child's education, they do not have adequate educational experience to provide assistance and guidance to their children.
- **Extreme poverty of the family:** Extreme poverty of the tribal families is one of the major causes of children not attending school. Although they are being supported with textbooks, school uniforms, reading and writing materials free of cost, hostel facilities in selected areas without any payment and some stipends, the families still cannot afford to send their children to schools regularly as some of them are engaged in supplementing the meagre income of the family. Further most of the girls, as stated earlier, are engaged in the care of their younger ones and in domestic chores.
- **Inaccessibility to schooling facilities:** Usually the tribal habitations are small and scattered separated by adverse geographical conditions. It is difficult for any child to cross natural barriers to come to the neighbourhood school situated within 1km distance from the habitation as per Govt. norms. Establishing schools in all such small habitations with hardly 4 to 6 children is also not a viable proposition.
- **Inadequate and irregular teachers:** Poor communication facilities, presence of natural barriers and without minimum residential facilities make it even more difficult for any outside teachers to attend the schools regularly. Most



Notes

of the teachers of these schools working in most adverse conditions in the remote tribal areas are quite demotivated and are quite disinterested in doing their job with proper enthusiasm.

- ***Less/No use of Mother Tongue (Home Language) as Medium of Instruction:*** Mother tongue as a medium of instruction plays a vital role to bridge the gap of language learning. A child who has mastery over mother tongue develops other languages easily. The picture given in Fig 1 below depicts this very well. If you compare the two bridges you will notice that one is strong and another is weak. This difference occurs due to no or less use of mother tongue in learning teaching process as well as in text book. But why do we need a strong foundation in mother tongue for beginners?

We know very well that if early education of the children is based on their mother tongue, the foundation in both language learning and concept learning will be strong. It has been observed that:

- Children learn better from a familiar starting point.
- Children learn better through a language they speak and understand well.
- Learning to read and write is easier in a familiar language.
- Concepts are best understood through mother tongue.
- Second language learning is more successful with a good foundation in mother tongue.
- Indigenous knowledge is best learned through indigenous language.
- Children with a solid foundation in their mother tongue develop stronger literacy abilities in other languages.
- Knowledge and skills learnt through mother tongue are transferred efficiently while learning the second language.

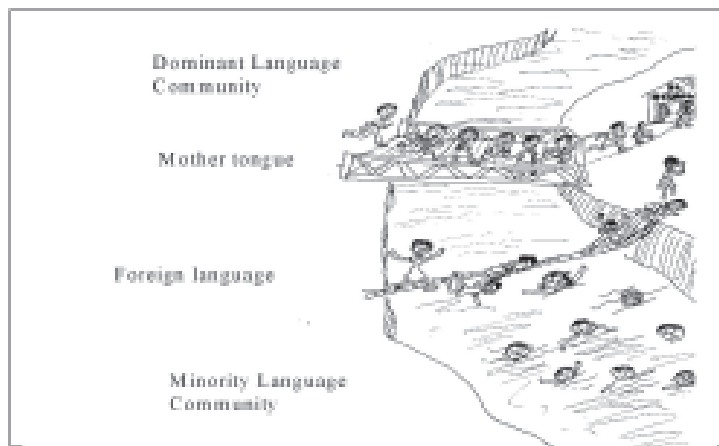


Fig 10.1: Language and Children



So what happens when children are taught only in second language?

Just imagine you are attending a class on any topic in history as a student and you are taught in a foreign language say Chinese which is totally unfamiliar to you. What would be your condition in such a situation? Could you properly grasp what are being taught? If your teacher cannot understand your language properly, could you interact with him? Almost similar is the condition of a tribal child attending a class in a primary school and taught by the teacher in a language not clearly understood by the child. In such a situation the children seem to be totally disinterested in what the teacher is saying. They stare vacantly at the teacher and sometimes at the blackboard where some alphabets had been written. The children are afraid of asking any question as they are totally confused. At one point, tired of speaking and realizing that that the young children are completely lost, the teacher may ask them to copy the text from the black board. The only option then left for the children is to rote learn the text without understanding and those children who cannot bear the burden of rote learning leave the school. That is why it is recommended that second language should be introduced as a subject of instruction until the children are sufficiently familiar with it.

- ***Less or No use of local knowledge and socio-cultural context in learning-teaching process:*** A tribal child lives in an active environment with a very wide scope to interact with rich natural and cultural resources available in and around his/her habitation. His/her experiences are gathered from his/her interactions with the socio-cultural and natural elements that exist in the environment. These elements can help the child to go beyond in acquiring the textbook knowledge. Experiences say that if children find their own festival, song and dance, picture, local fair etc. in their textbook as well as in learning teaching process, they find pleasure to learn. It creates a meaningful environment for children. But unfortunately tribal children do not get such scope in our school system. They have to read the textbooks which may not have content, concept, and example of their locality and culture.

E6. State *any* four reasons as to why mother tongue is important for beginners in the school?

10.4.2 Strategies for Resolving Pedagogic Issues

Given below some strategies to handle pedagogic issues we discussed above.

- ***Using mother tongue as medium of instruction:*** As mentioned earlier, if you teach a child having 5-6 years of exposure to his/her mother tongue in a language unknown to him/her, he/she may not understand anything that you say. For example: a Santali child in class I can understand ‘*alah*’ but not ‘house’, ‘*merom*’ but not ‘goat’, ‘*daka*’ but not rice. Though he/she can



Notes

Contextualizing Learning Processes for Disadvantaged Learners

elaborate 5-10 sentences about his/her house (alah) in his/her mother tongue but may not understand one sentence about house in a language foreign to him/her.

So use of mother tongue (home language) as a medium of instruction not only makes the child understand the concept but also brings self confidence in him/her.

- ***Integrating local knowledge in learning teaching process:*** No textbook can incorporate all the local knowledge from different areas of a state or a country. Here a teacher has to start with local knowledge to teach each concept and link them with the textbook knowledge. For example: If a teacher has to teach 'unit of measurement' in mathematics he/she has to start with the non-standard units that are used in day to day life such as *sero, mana, pana, kahana* etc. After that he/she can teach the standard units of measurement like Kg, Km, Litre etc.
- ***Using socio-cultural components in learning-teaching process:*** A community has its own life style, own social values, socio-political organization and religious beliefs. They have their own food habits, dress and ornaments, agriculture and industry. They have knowledge on every aspect of life and this base knowledge need to be taken into account to facilitate learning. Further knowledge can be imparted based on their cultural elements,
- ***Using folk materials in classroom learning:*** Every community has its folk stories, songs, riddles, drawing and painting, puzzles etc. While facilitating learning, these materials may be used in their full potentials because these materials not only facilitate for easy and meaningful acquisition of learning outcomes but also make the learning process pleasurable.
- ***Adapting textbook with socio-cultural knowledge:*** Adapting the text book means, bringing the socio-cultural elements it the text of the text books and preparing alternative text wherever necessary for children's experiential learning.
- ***Learning of children's mother tongue by the teacher:*** If a teacher knows children's mother tongue, his/her job will be easier even though it is difficult to learn language of each child. But when a teacher has commitment, he/she can learn languages to talk with the children and community in their language.
- ***Learning cultural knowledge from the community:*** The teacher has to learn the knowledge of the child's community first. This can be possible when the teacher has interest to learn, and identifies himself /herself with students' community. He/she has to talk with the community people, discuss with them on different socio-cultural milieus and attend festivals in the community.



- **Involving communities in school activities:** A good teacher always uses the community resources. Community involvement in school management and classroom activities brings a positive change in the performance of children in the school. A community member can be involved to teach students local art and craft, songs and music, fables and stories, and other good practices of the community.

Thus we can say that use of mother tongue (home language) as medium of instruction in our learning-teaching process will facilitate learning better now and in future.

E7. Write four major strategies to solve problems of tribal learners in your school.

10.4.3 Understanding the Socio-Cultural Components

If you can interact with tribal children in their mother tongue and have adequate knowledge of the socio-cultural elements of their environment, then you are in a better position to facilitate their learning particularly during early period of their schooling. Undoubtedly, a teacher from the local community (mother tongue teacher) will easily bring socio-cultural elements of the local community into the classroom. But when a teacher neither knows children's mother tongue nor have any acquaintance with their socio cultural components, there is a communication gap between the students and the teacher. In that case the teacher will not be able to understand his/her students and students will not be able to follow their teacher.

Figure 10.2 below summarizes the different socio-cultural components of a society.



Fig 10.2: Socio-Cultural Components of a Society



Notes

First of all the teacher has to understand the socio-cultural process and identify culturally available resources in tribal area for contextualizing the learning teaching process without facing difficulties. For this the teacher has to be a part of the community life.

Let us consider an example. If, a teacher has to discuss the ‘Type of food’ from the textbook, he/she can start with the food type and food habits of tribal people as the types of food explained in text book may not match the food the tribal children take every day. So to link their experience on types of food, the teacher has to go beyond the textbook. In other words, he/she must use children’s experience on types of food, food and health etc. as the base for initiating the textbook knowledge.



ACTIVITY 5

Tribal people have their own Feasts and Festivals, Food habits, Dress and Ornaments, Religious belief and practices and Health and hygiene. Choose any four of these components and state examples of how they can be utilized in the teaching learning process of the tribal children

Folk Materials for facilitating learning: Folk materials like folk stories and songs are very useful socio-cultural elements that can be effectively used for facilitating learning of all children and particularly the children from tribal communities where these materials are available in plenty and children are extremely fond of them. The folk materials are varied as shown in the figure 10.3 below and have multiple uses in different contexts facilitating classroom learning



Fig.10.3: Different Types of Folk Materials

10.4.4 Planning and Managing Multi-Lingual Classroom

Every classroom in the schools in tribal dominated areas is a multi-lingual classroom. Either children from different tribal groups with their respective



mother tongues are in one class reading in the standard state language (typical multi-lingual situation) or all children in a class are from one tribal group with the same mother tongue reading in the standard state language (typically bilingual). Although the situation prevailing in the classroom is bilingual or multi-lingual, the classroom teaching-learning transactions are conducted in the standard state language ignoring the mother tongues of the children. In order to make learning more meaningful at the early stage of schooling using mother tongue and gradually learning more languages, a programme of Multi-lingual Education has been initiated in some selected schools in the tribal areas of Odisha and Andhra Pradesh under the Sarva Shiksha Abhiyan (SSA).

Multilingual Education (MLE) is a programme of language learning and cognitive development providing:

- a strong educational foundation in the first language,
- successful bridging to one or more additional languages,
- enabling the use of both/all languages for effective learning of different subjects.

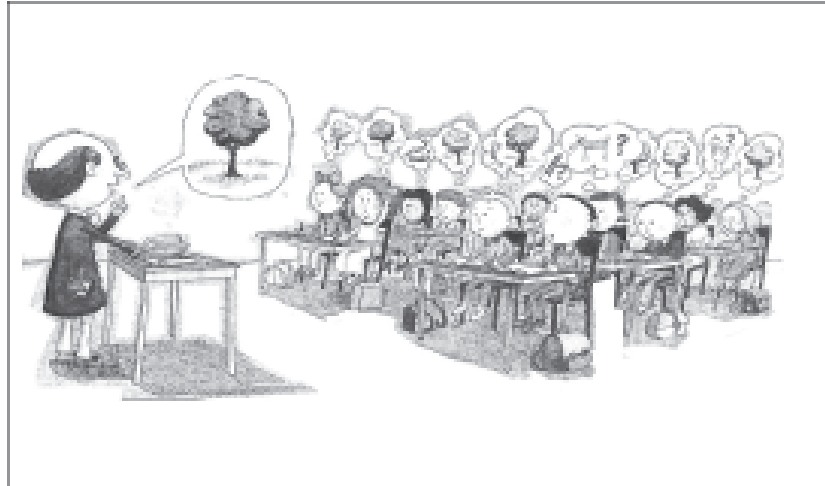
Since language is the vehicle of culture and traditions, no sensible language curriculum can afford to miss the cultural context while learning the language or learning other subjects through the mother tongue. In the MLE programme, the curriculum is based on the cultural context of the local community, using local knowledge and customs through which a child can develop common concepts of all areas of learning. So the purpose of a multilingual education programme is to develop appropriate cognitive and reasoning skills enabling children to operate equally in their native, state, and national languages. It should be started with *mother tongue (home language) with transition to second language and other languages in a phased/graded manner*.

A multi-lingual classroom situation reveals that children with different mother tongue learn together in a class. Although they live in the same locality, their life style, food habit, religious belief, dress and ornaments are different. In other words their socio-cultural back ground is different. This is a peculiar class room situation where a teacher has to play an innovative role to facilitate learning of each child. Observe the following picture.



Notes

Contextualizing Learning Processes for Disadvantaged Learners



The teacher asked “What do you see in this picture?” in a multi-lingual classroom situation. Find the students’ responses from the picture. Have you experienced such a situation?

Managing a multi-lingual classroom is a real challenge for the teacher as this type of classroom management:

- requires the teacher to be a speaker of the child’s language and preferably a member of the child’s community,
- expects close rapport among the students and teacher,
- emphasizes the values of the child’s culture,
- provides a safe and developmentally sensible bridge to other cultures and other languages that the child will encounter,
- learning begins with known and moves to unknown,
- uses cultural concepts to teach basic academic concept,
- builds on the vocabulary that the child possesses and adds the second language vocabulary from what the child has learnt,
- requires involvement of local community in the development of curriculum, learning materials and learning teaching process, and
- utilizes thematic approach to integrate child’s cultural knowledge with academic learning.

E8. State the characteristics of an ideal multi-lingual classroom.

E9. What are the two important characteristics a teacher should possess to manage the MLE classes effectively?



In Unit-9, you have learnt how subjects are integrated. In a multi-lingual class, several socio-cultural knowledge of the locality/community to which the children belong are integrated under one theme combining concepts of different subjects. Such a mapping of the integrated concepts and socio-cultural knowledge is called a 'Theme Web'.

For example, let us take the theme 'Water':

Subject	Concept(s)	Socio-cultural Knowledge of the community (in home language)
Geography	Natural source of water	Springs, stream, river, rain
Science	Purification of water	Sedimentation in pots, filtering with fine cloth, using powdered seeds of drum sticks
Mathematics	Measurement of volume of water	Non-standard measures, counting
Language	Composition, Recitation	Local/folk songs,

When presented diagrammatically this arrangement looks like a web and hence called a 'theme web'.

Materials to manage multi-lingual classroom

To manage multilingual class a teacher has to prepare theme webs and some contextual teaching learning material, such as: picture story book in mother tongue, alphabet chart in mother tongue, Word Web, Multilingual dictionary, Total Physical Response (TPR) in second language etc.

Picture Story Book: Picture story book is a reading material in which left hand side of the page contains a picture and right hand side has text. The text elaborates the picture in the mother-tongue. The sentences are simple and short. It is one type of picture reading which promotes reading with guessing. An example of a picture story book on Santali language is given below.



*Meram neherkate tarub metadeyay hape inj
hatam aalah khanah jam mota hej lenge
ada jaminjame. (The goat requested the
tiger
to take him and to leave his child.)*

Taking the community's folk tales, the picture story books can be prepared in children's mother tongue where children can develop reading skills as well as



Notes

develop power of comprehension. If a teacher has 20/30 picture stories for a class, the children will get a scope to enhance their language skills specially reading skill.

Word Web: Word web is a strategy to move from Mother Tongue (MT) to second language. As children know their mother tongue better, word web will help them to go from MT to second language. Look at Fig 10.4 given below. The middle circle represents the topic. The first box represents picture and the last box represents the meaning in 2nd language.

If a teacher has word web for each topic of the text book (class I and class II), the language transition will undoubtedly be easier.

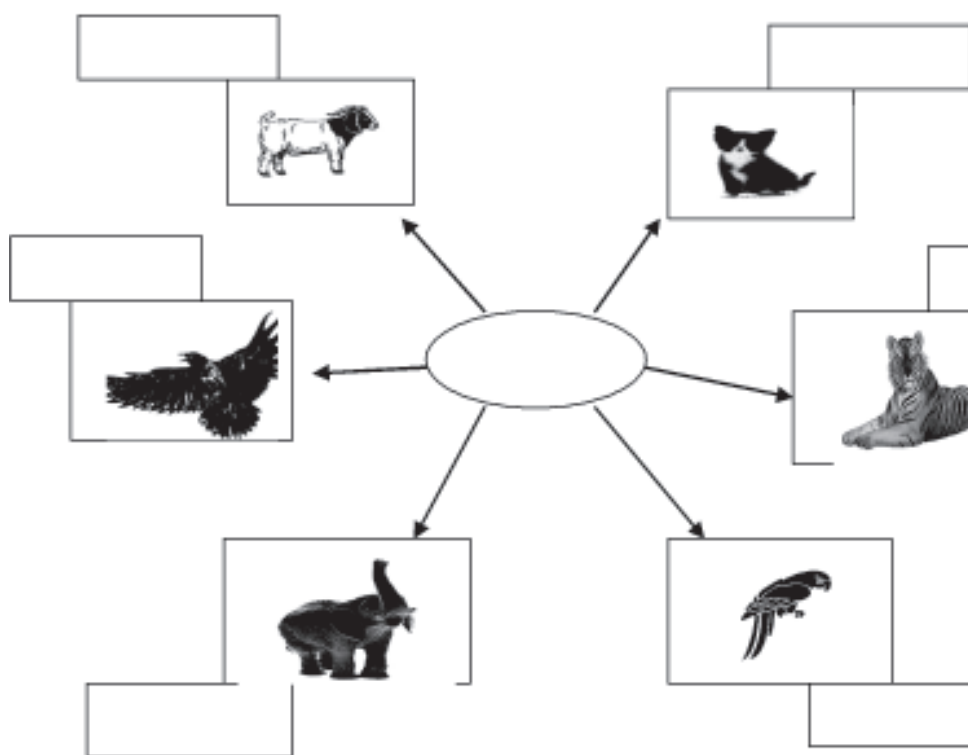


Fig 10.4: Illustration of Word web

Multilingual Dictionary: A teacher can prepare a multilingual dictionary by taking words from the mother tongue of each child in his/her class. He/she can take the help of a local mother tongue teacher and children for building words as shown in Fig 10.5. Multilingual dictionary is hence a device for easy language transition. It not only increases vocabulary of the children but also enhances the power of comprehension.



Notes






Object	→ Meaning	Santali	Munda	Saupa
				
				
				
				
				

Fig 10.5: Illustration of Multilingual dictionary

Letter Recognition Card: Compare the two charts shown in Fig 10.6. Which chart you think will be beneficial for Santali children?

Surely Chart No-2 because it is contextual for the Santali children.

This kind of material helps the teacher to teach letters of alphabet meaningfully.



Fig 10.6: Illustration of Letter Recognition Chart

Total Physical Response (TPR): Usually children not well versed in a particular language can respond to some commands that instruct the student to give some very common physical responses. These are commonly in the following forms:

‘Stand up’, ‘Sit down’, ‘Touch your head’, ‘Turn around’, ‘Hold your pen’, ‘Touch your nose’

and are called ‘Total Physical Response’ (TPR). This is a type of ‘listen and do’ activity. In early classes (especially in class I) the teacher can develop second language through these TPRs. Here the children can do these activities in response to teacher’s action combined with the verbal command. In course of doing the activity the children will gradually acquire the meaning in second language.



Notes

Experience says that if a non-MT teacher uses about 200 TPRs in class I, he/she can manage a multilingual class well.

E10. Write 10 TPRs which can be used for beginners in your school.

Multi-lingual Education Programme holds a lot of promise for several innovative ideas for using the language and cultural contexts of the community for encouraging meaningful and sustainable effective learning of very high quality. Although, it is highly suitable for the schools in the tribal areas, it is also equally effective for other schools where a child has to learn and interact in more than one language.

10.5 LET US SUM UP

- Some children are disadvantaged in the normal classroom conditions because of their socio-economic –cultural conditions. Some children are also disadvantaged as they have some special needs to make up for their physical and learning disabilities. Girls, children of minority groups, children with special needs are some major groups of disadvantaged children in the classroom.
- The mismatch between the socio-cultural contexts of home and school environments is the main reason of disadvantage for such children.
- For facilitating meaningful learning for the disadvantaged students, the local socio-cultural contexts and knowledge have to be incorporated with the textbook knowledge.
- Community mobilization, creating favourable infrastructure, removal of discriminatory elements and practices in the school and classroom, providing timely incentives would reduce the problems that girls are facing in schools.
- Provision of text materials in home language, engagement of language teacher are two major supporting factors for facilitating learning of children of language minority groups.
- Modernization of schools managed by religious bodies, encouraging participation in all group activities in the school and classroom, removing all factors causing isolation, and providing supportive learning materials and incentives would considerably reduce the problems of children from the religious minority families.
- Children with special needs like children with loco-motor disability, visual impairment, hearing impairment, lower level of intellectual functioning and deficits in adaptive behaviour require specific methods for their identification and specific ways to facilitate their learning in the normal classroom.



- Apart from socio-cultural specificity, the tribal children's greatest factor of disadvantage is the mismatch between their home language and the school language.
- Multilingual education has a lot of promise for tribal children in meaningful learning of all school subjects initially through the mother tongue and gradually through other languages along with the use of culturally contextual materials and experiences.

10.6 UNIT END EXERCISES

1. What is the importance of the local specific contexts for effective classroom learning?
2. What are the difficulties faced by a CWSN in a normal classroom? How can you take care of such children in the classroom for facilitating their learning?
3. Suppose you are teaching in a tribal dominated school. You do not know the mother tongue of those children. How can you organize activities that children will learn better?
4. You are to teach about 'Health' in class III. Design activities for the topic based on children's local language.

10.8 MODEL ANSWERS TO CHECK YOUR PROGRESS

- E1. Use of children's experiences, Use of local contextual examples, focusing learning as a process, ensuring children's liberty to ask questions, and focus on thinking of children.
- E2. Schools at a distance, unfavourable school environment, discriminatory school/classroom practices, materials with adverse gender bias (any two).
- E3. Ensuring participation in group work.
- E4. Scope for peer support in learning, Enhancement of self-respect.
- E5. Sitting in the front row (for clear vision of the black board vision impaired and for better hearing the teacher's voice) and participation in group work.
- E6. Any four of the following:
- Children learn better through a language they speak and understand well.
 - Learning to read and write is easier in a familiar language.



Notes

Contextualizing Learning Processes for Disadvantaged Learners

- Concepts are best understood through mother tongue.
- Second language learning is more successful with a good foundation in mother tongue.
- Indigenous knowledge is best learned through indigenous language.
- Children with a solid foundation in their mother tongue develop stronger literacy abilities in other languages.

E7. Any four like the following:

- Using mother tongue as the medium of instruction
- Using socio-cultural context and folk materials
- Adapting the existing text book with local knowledge
- Using local contextual TLM in learning teaching process

E8. Free use of more than one language including the students' home language, use of locally available folk materials, more group learning, free interaction among students and teacher, presence of support from the local community,

E9. Fluent in students' home language and also in other languages, Rapport with the students.

E10. Stand up, Sit down, Come here, Clap your hands, Nod your head, Raise your hands, Touch your nose, Show me your teeth,.....(basically imperative sentences)

10.7 SUGGESTED READING & REFERENCES

1. Department of School Education and Literacy (2011). *Sarva Shiksha Abhiyan: Framework for implementation based on the Right of Children to Free and Compulsory Education Act, 2009*. New Delhi: Ministry of Human Resource Development, Government of India.
2. Garcia, Ofelia, Skutnabb-Kangas, Tove, and Torres-Guzman, Maria E.(Eds.) (2006). *Imagining multilingual schools: Languages in education and globalization*. Hyderabad: Orient Black Swan.
3. Mohanty, A.K., Panda, M., Phillipson, R., and Skutnabb-Kangas, T. (Eds.) (2009). *Multilingual education for social justice: Globalising the local*. Hyderabad: Orient Black Swan.
4. National Council of Educational Research and Training (1988). *In-service Teacher Education Package – For Upper Primary and Secondary School Teachers*. Sri Aurobindo Marg. New Delhi: NCERT.

UNIT 11 ICT IN LEARNING



Notes

STRUCTURE

- 11.0 Introduction*
- 11.1 Learning Objectives*
- 11.2 Information Communication Technology (ICT)*
- 11.3 Tools of ICT*
 - 11.3.1 Classification of Tools*
 - 11.3.2 Uses in the Classroom*
- 11.4 Integration of ICT*
 - 11.4.1 In the Learning Process*
 - 11.4.2 In Assessment*
- 11.5 Let us Sum up*
- 11.6 Model Answers to Check your Progress*
- 11.7 Suggested Readings and References*
- 11.8 Unit-End Exercise*

11.0 INTRODUCTION

As a teacher you have experience in teaching different concepts in various school subjects using different types of teaching learning methods and materials for making learning more interesting and effective in the classroom. However, in many cases you may have faced difficulties in accessing information from different sources and provide more opportunities for students' participation in the classroom. In this respect Information and Communication Technologies (ICTs) has opened up the possibilities to access a range of information for both teachers and students which was unthinkable a decade back. Besides, it is now felt that ICT can assist in promoting more learner-centred and interactive learning. As a teacher you have to develop the skill of integration of ICT in the classroom. In this unit, let us learn the meaning of ICT, different ICT tools, ways of integration of ICT in classroom transaction and in the assessment process.

You will need at least 7 hours of study for completing this unit and understanding the concepts included in it.



11.1 LEARNING OBJECTIVES

After completing this unit, you will be able to:

- explain the meaning of Information and Communication Technology (ICT).
- identify and use the different tools of ICT.
- integrate ICT tools in classroom activities.

11.2 INFORMATION COMMUNICATION TECHNOLOGY (ICT)

Information and Communication Technology (ICT) is defined as a diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information (UNDP, 2000; UNESCO 2002). This definition of ICT includes such technologies as radio, television, video, DVD, telephone (both fixed line and mobile phones), satellite systems, computer and network hardware and software as well as the equipment and services associated with these technologies, such as video conferencing and electronic mail. ICTs comprises of the following three components:

- Information and Communication Infrastructure (ICI)* which includes physical telecommunications systems, networks (cellular, broadcast, cable, satellite, postal) and the services that utilize those (Internet, voice, mail, radio, and television);
- Information Technology (IT)* that refers to the hardware and software of information collection, storage, processing, and presentation (World Bank 2002); and
- Communication Technology (CT)* like telephones, e-mail, chatting, etc. which helps to disseminate information and facilitate interaction among students and teachers irrespective of the distance, time and situations.

Therefore, ICT can be understood as integration of information technology with different kinds of communication technology with the help of appropriate infrastructure. It can be said that there is major role of information technology in enhancement of communication. Given below are examples of such technologies are:

- Print based materials,
- Photography, pictorials, graphics,
- Audio communication systems including audio broadcast,



- Telecommunication,
- Satellite communication,
- Computer based technologies like the Internet and E-mail,
- Wireless communication,
- Mobile technology.

11.3 TOOLS OF ICT

The tools ICT may be in the form of audio, visual and audio-visual. There is a diverse set of technological tools and resources used to communicate, and to create, disseminate, store and manage information. The tools of ICT have great potential to facilitate the acquisition of knowledge and developing proper understanding by the students in the classroom. Just think about how you collect the information from different sources?

Generally you collect information from different sources available to you like textbooks, magazines, reference books, journals, class notes and other non-print sources. But to make the collected information presentable in the classroom, you require more time and resources which are not always available to you. Hence, very often you feel your lesson is not comprehensive. Again the students often cannot have direct access to the information that you can have. But, the tools of ICT reduced such gaps and made not only acquisition and absorption of knowledge by the students possible but also sharing/collaboration in the classroom. The tools of ICT also have the potential to create learning opportunities for all types of students including both physically and mentally challenged students.

The tools of ICT are not single technology but combination of hardware, software, multimedia, and delivery systems. Today, ICT in education encompasses a great range of rapidly evolving technologies such as Desktop, Notebook, Handheld Computers, Tablets, Digital Cameras, Local Area Networking, Bluetooth, the Internet, Cloud Computing, the World Wide Web, and DVDs and applications such as word processors, spreadsheets, tutorials, simulations, email, digital libraries, computer-mediated conferencing, videoconferencing, virtual environment, simulator, emulator etc. These tools of ICT can be used for creating learning situations in the classroom as well as in engaging the students in higher order thinking.

11.3.1 Classification of Tools

In the classroom you prepared and followed different instructional activities for the success of learning. In such learning process ICT can play different roles according to the nature of the content and the learning style of the students. The



different available tools of ICT have different roles in the classroom. We can broadly classify the tools of ICT into four categories as follows:

- i. informative tools,
- ii. situating tools,
- iii. constructive tools, and
- iv. communicative tools.

These tools have different uses in different contexts. Let us discuss these tools in details.

- i) **Informative Tools:** These tools of ICT provide huge information in various formats such as text, sound, graphics, or video. Examples of informative tools include multimedia encyclopaedias or resources available on the World Wide Web (www or Web). You can use the informative tools particularly for the purpose of collecting information. Although these tools cannot help to get the real life experiences, it presents abstract information. Suppose you are going to teach the concept of democracy in social science. You may assign the students to collect information on the governance system of different countries. Students can collect different information on governance with help of the informative tools of ICT like internet.
- (ii) **Situating Tools:** There are some ICT tools like simulation, games, and virtual reality through which students can be placed in an environment where they may get “nearly direct experience” through observation or practice in an artificially created model of real situation. These tools particularly help to understand the abstract concepts. Suppose you are going to teach on the topic blood circulation system of human beings. Students will gain better experiences by the help of You Tubes, video clips, specially prepared DVDs etc. where they can observe the moving streams of blood in the arteries and veins and functioning of heart with details of the physiology of the blood circulation.
- (iii) **Constructive Tools:** There are different tools of ICT that you can use for constructing, manipulating as well as visualizing your own knowledge. For example, the tools of ICT like web authoring applications which allow creating one’s own web pages and communicating ideas to others around the world. Here your constructive ideas/information reaches throughout the world including peers and teachers. In the same time you can also get the feedback about your ideas from the learner community. Other examples of such constructive tools of ICT are Mind tools, which includes computer applications such as databases, spreadsheets, semantic networking programs, expert systems, modelling tools, micro worlds, and hypermedia authoring tools that enable students to represent and to generate the knowledge. The term “constructive” originate from the fact that these tools of ICT enable to produce a certain tangible product for a given instructional purpose.



- (iv) **Communicative tools:** We communicate our ideas/ knowledge/views with the help of communicative tools. But many of them are time-consuming. Take the example of the postal system which takes more time for your information to reach. Although the telephonic device reduced the time but its limitation is between two people. However today we can communicate with a large group of people within a few seconds by using ICT tools. Examples of such communicative tools include e-mail, electronic bulletin boards, chat, teleconferencing, and electronic whiteboards. Such communicative tools of ICT are called web-2.0. One of the important characteristics of such tools is simultaneous conversation among the group of people in the form of text, picture or sound. These tools are the systems that can enable communication between the teacher and students or among students beyond the physical barrier (due to space, time, or both) of the classroom.

11.3.2 Use of ICT Tools

Information Communication Technology (ICT) have enabled changes in the lives of people, their world of work, and helped them to interact with several persons and sources around the world. It opened up new ways to acquire knowledge. The use of ICT tools not only conforms with in the sector of education but also it has major use in different sectors like finance, industry, insurance, medical and management also. Today the tools of ICT are vital in the classroom for creating the learning situation. These not only help the student for collecting information from different sources but also give an opportunity for disseminating the information among the peers. The impact of use of ICT on students is highly dependent on the teaching approaches and better outcome result when student-centred guidance, group work and inquiry projects are used. Let us discuss different use of ICT tools in the teaching learning process.

- **In Pedagogies:** As a tool, ICT can provide the supportive or facilitative approaches in the classroom. By using tools of ICT, particularly the situating and communicative tools, you can guide the students learning and at the same time students also get the supportive service from the ICTs. Besides, you can also use the tools of ICT in different phases of pedagogical process i.e. during the introduction, presentation as well as in the assessment phase. In the classroom during your instructional process, the tools of ICT will motivate the students and encourage interaction among the peers. However, the ICTs by themselves will not improve pedagogy. Teachers who shift their pedagogies to be more student-centred, project-based and collaborative learning based teaching, ICT will support and assist. In a conventional education system, ICT may be used to support teacher-centred pedagogical approaches or in the combination of the two approaches. The aim is to make sound choices about what is best in different circumstances, selecting and using appropriate ICT tools for improving pedagogy. In other words,



Notes

ICT can play a major role in promoting pedagogy for the facilitation of effective and efficient learning.

The roles of ICTs in the different types of pedagogies/ classroom processes and how different tools of ICT can help such pedagogy is illustrated in the following Table 11.1.

Table 11.1

Teaching Style	Main Characteristics	Use of ICT Tools
Teacher-centred approach	<ul style="list-style-type: none">Teacher as the source of knowledge.Teacher tends to be more active and students receive the information passively	A wide range of ICT tools can be used to aid the teacher's presentation and performance. Hand-outs, overhead projector(OHP) slides, models etc. can be used to capture and retain the learner's attention
Learner-centred approach	<ul style="list-style-type: none">Learner as knowledge seeker, with teacher as facilitator and guide.The learner tends to be active, talking and doing things in the process of learning.The teacher designs and manages the setting as well as the process of learning.	ICT can be used extensively to help the learner make the sense of the tasks assigned and learn what is required. Work sheets, informative and communicative tools of ICT need to be available to the learners on an individual basis or in small group.
Combination of the two approaches	<ul style="list-style-type: none">In some cases, the teacher dispenses knowledge and the learner has to take things on trust. At other times, the teacher simply creates the conditions for the learner to explore and discover knowledge.	ICT can be used to aid the teacher's presentation as well as to assist learners in their exploration

(Source: Wright, C. (2000). *Issues in Education and Technology: Policy Guidelines and Strategies*, London: Commonwealth Secretariat)

- In collaboration:** In learning centred approach of teaching, sharing/ interaction among the students and between the student and teacher is an important component. There are some tools of ICT that can be used for the purpose of collaboration inside and outside the classroom. You can share your views/ideas/knowledge with your students by using such tools and in the same time your students also share their ideas, suggest different views, and also clarify their doubts. These tools of ICT particularly used for the purpose of sharing are called as Social Communicating Tools. Examples of such social net working tools are wiki, yahoo group, Google group, blog, Facebook, twitter, my space etc.



- ***In Assessment:*** There are different tools of ICT available today that can be used to assess your students' performance during your teaching-learning process as well as after completion of the course. These tools enable both the process based assessment as well as the product based assessment. Suppose you want to assess the students' best work in your subject throughout the year. You can take the help of one of the tools of ICT called e-portfolio, through which you can easily and quickly assess your students' performance. Similarly other tools of ICT that can be used for assessment are online-rubric, online- peer assessment and digital concept mapping, etc. The advantages of using ICT tools in the assessment process are time management and it encourages reflection among the students.
- ***In the context of learning process:*** ICT enables your classroom by encompassing a variety of techniques, tools, content and resources. Ranging from projecting media to support a lesson, multimedia self-learning modules, simulations to virtual learning environments, there are a variety of options available to you for utilizing various modes/ICT tools in the learning process. Each of these device or strategy involves changes in the classroom environment and understanding of its effectiveness. ICT does play a significant role in different forms of teaching learning process viz., individual learning and teaching, group learning and teaching, collaborative learning activities, etc.

- *Individual learning*

Searching alternative sources of learning, reading a text, making queries and communication directly with experts, solving problems, taking assignments, assessing own progress, and getting feedbacks are some of the activities in individualized learning. Networking of computer and use of internet promotes such activities in individual learning. In such an approach of learning students completely take the help of ICT and then as a teacher your task is to monitor their learning and to regulate the learning process. This approach of learning is often called as Self-Regulatory Learning (SRL) in which ICT plays a vital role to make the learner as a self- regulatory learner.

- *Group learning and teaching*

Suppose in your class, you like to teach through group work strategy. In this strategy you can take the help of different tools of ICT that are suitable for group learning. For example, a particular group of students can have access to online lecture and facilities for interaction with the presenter as well as with other members in the same group. Today various kinds of course based teaching materials are available on World Wide Web (WWW) which makes it possible for fast delivery of course materials as well as problem solving activities. In your group learning



Notes

strategy students can access such material from the web and undergo group interactions

- **Collaborative learning** :Collaborative learning is commonly illustrated when groups of students work together to search for understanding, meaning, or solutions or to create an art fact or product of their learning. It is a situation in which two or more students learn or attempt to learn something together. Unlike individual learning, students engaged in collaborative learning capitalize on one another's resources and skills (asking one another for information, evaluating one another's ideas, monitoring one another's work, etc.). Put differently, collaborative learning refers to methodologies and environments in which students engage in a common task where each individual depends on and is accountable to each other. These include both face-to-face conversations and computer discussions (online forums, chat rooms, etc.).

E2. What are the different tools of ICT, which can be used in the learner-centre approach pedagogy?

E3. What are the different forms of ICT tools?

11.4 INTEGRATION OF ICT

Integrating ICT in the classroom is a challenging task for any teacher today. Operational knowledge of ICT alone cannot help you to use ICT in the classroom. You must have the fundamental ideas about the systematic ways (how and when) to integrate ICT in the classroom.

ICT integration is broadly defined as a process of using any ICT tools (including information resources on the web, multimedia programs in CD-ROMs) to enhance student learning. It is more of a process rather than a product. A simple placement of hardware and/or software will not make integration of ICT in the classroom. In order to integrate ICT in your classroom, you and your students will have to proceed in four different stages.

At the **first stage**, teachers and students need to discover ICT tools and their general functions and uses. Hence the emphasis is usually on ICT literacy and basic skills. Discovering ICT tools is linked with the *emerging stage* in ICT development.

The **second stage** involves learning how to use ICT tools, and beginning to make use of them in different disciplines. This involves the use of general as well as particular applications of ICT, and it is linked with the *applying stage* in the ICT development model.



At the *third stage*, there is an understanding of how and when to use ICT tools to achieve a particular purpose, such as in completing a given project. This stage implies the ability to recognize situations where ICT will be helpful, choosing the most appropriate tools for a particular task, and using these tools in combination to solve real problems. This is linked with the *infusing stage* in the ICT development model.

The *fourth stage* is when the learning situation is transformed through the use of ICT. This is a new way of approaching teaching and learning situations with specialized ICT tools, and it is linked with the *transforming stage* in the ICT development model.

11.4.1 Integration of ICT in the Learning Process

There are different models available for integrating ICT in the classroom. Many instructional design models are available to help you to integrate ICT in the classroom. Some examples are:

- The ASSURE model.
(Analyze learners; State the objective; Select method, media and materials; Require learning participation; Evaluate and revise)
- The ICARE model.
(Introduction; Connect; Activity; Reflect and Extend)

These models show guidelines for incorporating various resources and tools into teaching and learning. However, they do not explicitly encourage teacher-designers to think and justify why these resources and tools are used the way they are. Let us consider *a systematic model* for designing ICT integration plan. It is systematic because it follows a logical flow and organized in a linear manner. The key components of this model are as given below:

1. **Problem Statement:** The systematic model starts with a problem statement, which describes the major problems or issues to be addressed in a topic. For example, in the topic of “Energy,” the major problem is “*How energy can be conserved in India in the future?*” Such a problem statement serves as a starting point for the ICT integration plan. There are different concepts/ ideas in a topic during the teaching-learning process. There are concepts from which the learner does not get the real experience, or can visualize properly. You have to identify such concepts as the problems and plan to select such ICT tools that can solve such problem. The problem should be authentic, and challenging and relevant to the learners.
2. **Learning Objectives:** Learning objectives specify the intended learning outcomes at the end of the topic. You may write learning objectives based on the ABCD model, where A is Audience; B is Behaviour; C is Condition;



and D is Degree. For example, a complete description of a learning objective following the ABCD model might be:

At the end of the topic, the elementary students will be able to verbally describe the present energy situation in India and the ways to conserve it on a mind map with 100% accuracy.

In this example, A is “the elementary students”; B is “verbally describe”; C is “on a mind map”; and D is “with 100% accuracy.” It is worth mentioning once again that the behaviour in a learning-objective statement should be observable and measurable.

3. **Technology Required:** In order to address the above stated problem and to achieve the learning objectives, you need to carefully compare all possible technologies that can be used for learning this topic. The technologies in this model may include software such as multimedia courseware, web-based resources, communication tools (such as voice chat, textual discussion forums, or video conferencing), mind tools (such as concept mapping tools and multimedia authoring tools), or any other possible ICT tools. You need to identify the tools of ICT to use in order to teach the topic ‘energy’ cited above in a meaningful manner.
4. **Rationale for using the Technology:** Technology should be used not because it is available or it has been shown effective in some cases. It should be used to enable the process and enhance learning as well as make clarity of the topic. Inappropriate use of technology can lead to negative effects. As a teacher you need to choose proper technology and justify
 - i) why it is needed for the topic;
 - ii) what added values the technology can offer; and
 - iii) how the technology can support the instructional process.Moreover, other reasons for rationalizing the use of technology are:
 - i) high motivation;
 - ii) unique instructional capabilities such as helping students visualize data/problems or tracking learning progress;
 - iii) support for innovative instructional approaches such as collaborative learning and problem-based learning; and
 - iv) increased teacher productivity and student knowledge construction.
5. **Strategies for Implementation:** After determining what technology is needed and why, you need to decide how to incorporate the selected technology into the learning of the topic effectively and meaningfully. Since a topic is usually composed of several lessons, details on ICT integration should be



provided separately for each lesson as well as for the entire topic. For each lesson, you need to clearly answer the following questions:

- What ICT-based resources such as web sites, CD-ROM programs, or learning objects will be used?
- How will the ICT-based resources be used in various settings such as a full-lab, where each student uses a computer, or half-lab environment, where two students share a computer?
- Why should these resources be used?
- What tasks/activities will the students do during the lesson?

6. **Reflection and Further Suggestion:** A plan is never good until it is executed and proven right. In the planning process, very often you are faced with many constraints and restrictions that limit your choices and strategies. After conducting the ICT integrated lessons, you need to reflect upon your experiences of the ICT integration. The reflections can focus on the appropriateness of the technology used, strengths and weaknesses of the technology, and possible improvement. Additionally, you can also provide further suggestions on how other teachers can use the lessons for different groups of students in different contexts. These suggestions may include alternative technology, instructional methods and activities, assessment approaches, and ways to improve the integration of ICT. Given below are some points to help a teacher reflect upon an integration plan:

- Are the major questions involved in the topic answered?
- Are the activities planned towards achieving the learning objectives?
- Does the technology support the instructional process?
- Is the rationale for using the technology sound?
- Can the implementation process be further improved?
- Are the methods for student assessment valid?
- How can we further improve the use of ICT in the topic?

11.4.2 Integration of ICT in the Assessment Process

Recollect as to how you assess your students.

Usually at the end of the year, the students are assessed on how well they have mastered the intended concepts/competencies. The assessment approach mainly concentrates on the testing of basic knowledge, supposedly acquired through drill and practice, rehearsals and repetitions of what was taught in class or given in the textbook. Under such circumstances, tests, mainly of the choice-response format (such as multiple-choice, true/false or matching items), are the common tools for assessment. This assessment system is sometimes referred to as a 'testing



culture'. Now the assessment system has changed from testing culture to *reflective culture*. In the reflective culture of assessment, the primary emphasis is on self-assessment combined with peer-assessment. The purpose of such assessment is to assess students:

- Cognitive competencies such as problem solving, critical thinking, formulating questions, searching for relevant information, making informed judgments, efficient use of information, conducting observations, investigations, inventing and creating new things, analysing data, presenting data communicatively, oral and written expression;
- Meta-cognitive competencies such as self-reflection and self-evaluation
- Social competencies such as leading discussions and conversations, persuading, co-operating, working in groups etc. and affective dispositions such as perseverance, internal motivation, responsibility, self-efficacy, independence and flexibility.

These assessments often reflect both the process and the product. The assessment on the process examines how the students complete the learning activities or tasks, work together to complete the final product, or construct knowledge collaboratively by using the ICT. Methods used for the process assessment include writing online reflection journals, peer evaluation, or e-portfolios. The assessment on the product aims at investigating the quality of the final outcome, such as solutions to the problem, or software programs developed. Usually, there are two forms of assessment:

- *ICT-based assessment* which includes computer-based testing, multimedia program development, PowerPoint presentation, or concept map construction.
- *Non-ICT based assessment* which involves writing an essay or a reflection journal, or answering short questions on paper.

The integration of ICT in the process of assessment offers a set of possibilities, enhancing the implementation of an assessment culture. It enhances the integration of the following principles:

- *Flexibility*: Students can take part in formative as well as summative assessment at any time and at any place without any task restriction.
- *Assessment as a tool for learning*: The students have enough opportunity of learning while engaged in such assessment tasks or processes. Most test-serving systems offer profound feedback and students' progress is also available online due to which learning is enhanced.
- *Responsibility of students for their learning*: Flexibility is one condition for giving more responsibility to the learner. A second condition is sharing responsibility in the process of assessment. The use of electronic peer



assessment and electronic portfolios are examples of electronic assessment methods that are in line with this principle.

- *Product and process assessment:* In most electronic portfolios as well as electronic peer-assessment systems, product and process assessment criteria are used.
- *A variety of assessment instruments:* ICT enhances the permanent availability of a set of different assessment instruments starting from measuring knowledge reproduction by standardized tests to the assessment of skills by electronic portfolios or peer-assessment systems.
- *Authenticity of assessment:* Real-life cases, electronic simulation games etc. are available online, which makes it feasible to assess different aspects of students' competencies in an authentic way.
- *The student as an active participant in the assessment process:* One aspect of this is the students' responsibility to develop the criteria for assessment through interaction and discussion with teachers. Electronic peer assessment is one example. A second aspect is the use of assessment tasks that ask students to actively construct a solution to the task. Examples are online, simulations and electronic case-based assessment instruments.

E4. What is integration of ICT in the classroom?

E5. What are the tools that can be used in the process of assessment?

E6. What are the advantages of ICT in the process of assessment?

11.5 LET US SUM UP

- Information and Communication Technology (ICT) is defined as a diverse set of technological tools and resources used to communicate, create, disseminate, store, and manage information.
- ICTs can be divided into two components i.e. Information and Communication Infrastructure (ICI) and Information Technology (IT).
- The ICT tools may be in the form of audio, visual and audiovisual. The tools of ICT are not single technology but combination of hardware, software, multimedia, and delivery systems.
- The ICT tools can be classified into four categories: (a) informative tools, (b) situating tools, (c) constructive tools, and (d) communicative tools.
- The ICT tools can be used in the different aspects of teaching learning process. It can be used in the pedagogical process and in the process of assessment.
- Integrating ICT in the classroom is a pedagogical skill of the teacher rather than the technical skill and it follows a systematic planning model.



11.6 MODEL ANSWERS TO CHECK YOUR PROGRESS

- E1. Information technology and communication technology
- E2. Situating, constructive and situating tools of ICT
- E3. Audio, Visual and Audiovisual
- E4. Use of ICT tools in the pedagogical process
- E5. E-portfolio, Electronic peer assessment, Rubrics etc
- E6. Learning as flexibility and responsibility of learning

11.7 SUGGESTED READINGS AND REFERENCE

1. Wright, C. (2000). Issues in Education and Technology: Policy Guidelines and Strategies, London: Commonwealth Secretariat
2. Resta, P. (2002). Information and Communication Technology in Teacher Education: A Planning Guide. Paris: UNESCO
3. UNESCO (2005). Information and Communication Technologies in School. A Hand book for Teachers. Paris: UNESCO.

11.8 UNIT-END EXERCISE

1. Identify different tools of ICT that you can use in your classroom.
2. Select one of the topics from your subjects and develop a lesson plan in a learner-centred approach by using different tools of ICT.
3. What are the advantages of the tools of ICT in the process of assessment?
4. Distinguish between the informative and communicative tools of ICT, and discuss their roles in the process of learning with examples.

UNIT 12 COMPUTER ASSISTED LEARNING



Notes

STRUCTURE

- 12.0 Introduction
- 12.1 Learning Objectives
- 12.2 The Computer
 - 12.2.1 What is Computer?
 - 12.2.2 Functional Units
 - 12.2.3 Major Components
 - 12.2.4 Types of Computer
 - 12.2.5 Using the Computer
- 12.3 Computer as a source of Learning
 - 12.3.1 The Internet and the Web
 - 12.3.2 Internet-based Learning
- 12.4 Computer Assisted Learning
 - 12.4.1 Modes of Computer Assisted Learning
 - 12.4.2 Planning for Computer Assisted Learning
- 12.5 Let us Sum up
- 12.6 Model Answers to Check your Progress
- 12.7 Suggested Readings and References
- 12.8 Unit-End Exercises

12.0 INTRODUCTION

Recall what you do while you are teaching in a class. You prepare a plan for the class, arrange all the materials required to conduct different activities in the class, engage the students while you are teaching, explaining, demonstrating, asking questions, answering students' queries, conducting group activities, evaluating students' performance and many other activities related to the classroom teaching. Teaching-learning is a very complex process demanding a lot of efforts and responsibilities from the teacher. Therefore, it is not surprising that even the best teacher, sometimes fails to deliver as per his/her expectations.



However, the conventional teaching methodology has undergone tremendous change under the impact of the use of technology and in particular the use of computers in the teaching-learning process. There is a radical transformation in the teachers' roles in the classroom. The learning process especially the classroom learning is becoming more and more learner-centred where the onus of learning is more on the student (learner). The role of teacher has now changed from knowledge transmitter to knowledge mentor and facilitator of learning in the classroom. All you have to do as a mentor or facilitator of learning is to guide the student to access the various sources of experiences and information which would be used by them for learning. In this context, the role of the computer is vital for accessing and collaborating information from different sources and manipulating and processing for learning. Therefore, as a teacher, you have to develop the skills of using a computer in the classroom and acquire the basic knowledge about computer. In this unit, the fundamental ideas about computer and its basic operations applied in different modes of computer assisted learning are discussed. You will need at least 8 study hours for completing this unit and understanding the concepts embedded in it.

12.1 LEARNING OBJECTIVES

After completing this unit, you will be able to:

- identify different components of a computer.
- develop the skills to operate the computer.
- recognise the role of computers in the classroom.
- collect and disseminate information using the Internet.
- use different modes of Computer Assisted Learning.

12.2 THE COMPUTER

In today's world computers are all pervasive...we see them in shops, railway station, banks and offices. The use computers are different in different places. It is used for carrying out complicated mathematical and statistical calculations, preparing bills, and maintaining accounts in offices and shops, booking reservations in trains and airlines, in medical tests and surgeries, in storing and transmitting information in all fields of human knowledge. Computers have been widely preferred in different sectors because of its unique characteristics like speed, accuracy and efficiency. It has also found a place in education, particularly in the classroom. As a teacher you need to be fully aware of its functioning and use it in the classroom for the advantage of your students' learning.



12.2.1 What is a Computer?

A Computer is an electronic device that takes raw data as inputs from the user, processes these data under the control of a set of instruction (called programme), gives the result (output) and saves output for future purposes (storage). It can process both numerical and non-numerical (arithmetic and logical) calculations.



Fig- 12.1 Personal Computer

A computer as shown in Fig. 12.1 which performs the following five major operations or functions irrespective of their size and make.

- 1) It accepts data or instructions by way of input,
- 2) It stores data,
- 3) It can process data as required by the user,
- 4) It gives results in the form of output, and
- 5) It controls all operations inside a computer.

Let us discuss each of these operations.

1. **Input:** This is the process of entering data and programs into the computer system. You should know that computer is an electronic machine like any other machine which takes raw data as inputs and performs some processing giving out processed data. Figure 12.2 depicts the operation of Computer.



Notes

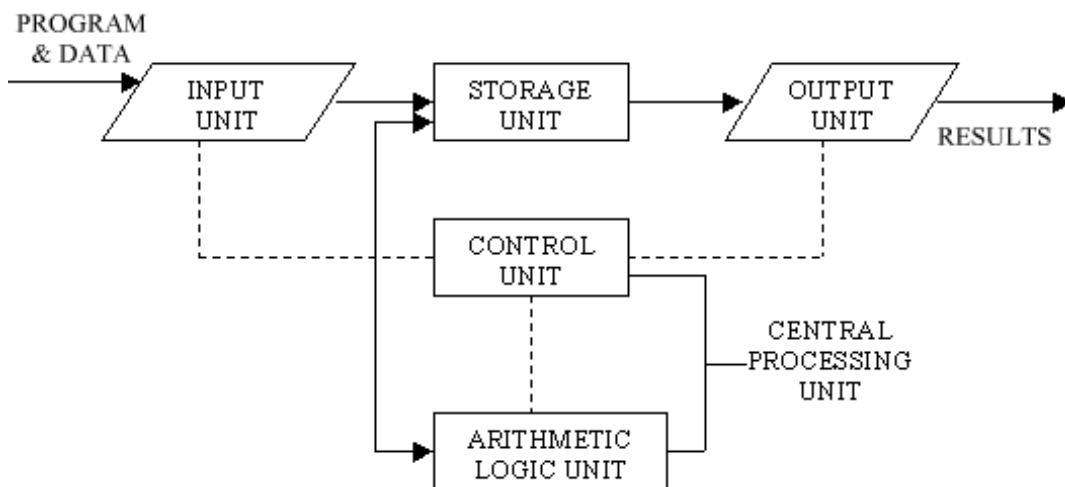


Figure-12.2 Operation of a Computer

2. **Storage:** The process of saving data and instructions permanently is known as storage. Data has to be fed into the system and stored in the system before the actual processing of those data starts. The data is stored in the storage unit for processing at a later period as and when required. After the data are processed, the output can also be stored for future use. Even in between the processing of data, some intermediary data can also be saved in the storage unit. This is a unique advantage of the computer not available in other common machines. This storage unit or the primary storage of the computer system is designed to do the above functions. It provides space for storing data and instructions.
3. **Processing:** The task of performing operations like arithmetic and logical operations is called processing. The Central Processing Unit (CPU) of the computer takes data and instructions from the storage unit and makes all sorts of calculations based on the instructions given and the type of data provided. The processed data are then sent back to the storage unit.
4. **Output:** This is the process of producing results after processing the data for getting useful information. The output produced by the computer after processing is also stored inside the computer for further processing before being given in a readable form.
5. **Control:** Controlling of all operations like input, processing and output are performed by control unit. It takes care of step by step processing of all operations inside the computer

E1. Why computer is known as data processor?

E2. What will be the problems, if storage system will not be there in the computer?



12.2.2 Functional Units

In order to carry out the operations mentioned in the previous section, the computer allocates the task between its various functional units. The computer system is divided into three separate units for its operation. They are i) arithmetic logical unit, ii) control unit, and iii) central processing unit.

i) *Arithmetic Logical Unit (ALU)*

After you enter data through the input device it is stored in the primary storage unit. The actual processing of the data and instruction are performed by Arithmetic Logical Unit (ALU). The major operations performed by the ALU are addition, subtraction, multiplication, division, logic and comparison. Data is transferred to ALU from the storage unit when required. After processing the output is returned back to the storage unit for further processing or getting stored.

ii) *Control Unit (CU)*

The next component of computer is the Control Unit, which acts like the supervisor seeing that things are done in proper fashion. The control unit determines the sequence in which computer programs and instructions are executed. Things like processing of programs stored in the main memory, interpretation of the instructions and issuing of signals for other units of the computer to execute them. It also acts as a switch board operator when several users access the computer simultaneously. Thus, it coordinates the activities of computer's peripheral equipment as they perform the input and output. It is the manager of all operations mentioned in the previous section.

iii) *Central Processing Unit (CPU)*

The ALU and the CU of a computer system are jointly known as the central processing unit. You may call CPU as the brain of any computer system that takes all major decisions, makes all sorts of calculations and directs different parts of the computer functions by activating and controlling the operations. The CPU (Central Processing Unit) is the device that interprets and executes instructions.

E3. Choose the correct answer:

- (i) The task of performing arithmetic and logical operations is called
(A) ALU, (B) CPU, (C) PC, (D) Processing
 - (ii) The ALU and CU is jointly known as
(A) RAM, (B) ROM, (C) CPU, (D) none of the above
 - (iii) The process of producing results from the data for getting useful information is called
(A) Output, (B) Input, (C) Processing (D). storage
-



12.2.3 Major Components of The Computer

All the components of the computer can be categorised into two broad groups i.e. hardware and software.

A hardware component of the computer refers to the internal and the peripheral devices that we can touch i.e. all physical parts of the computer. Software on the other hand refers to the set of computer programs, procedures that describe how they are to be used. That means softwares are set of programs which gives “intelligence” to the computer.

The hardware are the parts of computer itself including the Central Processing Unit (CPU) and related microchips and micro-circuit, keyboard, monitor, mouse, drives (floppy, CD, DVD, and Optical). Other extra parts called peripheral components or devices include printers, modems, digital cameras and cards (sound, colour, and video) etc. The components of a computer can be in four categories:

(i) Input devices (ii) CPU (iii) Storage devices and (iv) Output devices.

1. Input Devices: A computer is only useful when it is able to communicate with the external environment. When you work with the computer you feed your data and instructions through some devices to the computer. These devices are called Input devices. The major input devices are Mouse and Key Board. Input devices are necessary to convert our information or data in to a form which can be understood by the computer. A good input device should provide timely, accurate and useful data to the main memory of the computer for processing. The most useful input devices are the following.

- **Keyboard:** - This is the standard input device attached to all computers. The layout of keyboard is just like the traditional typewriter. It also contains some extra command keys and function keys. It contains a total of 101 to 104 keys. A typical keyboard used in a computer is shown in Fig. 12.3. You have to press correct combination of keys to input data. The computer can recognize the electrical signals corresponding to the correct key combination and processing is done accordingly.
- **Mouse:** Mouse is an input device shown in Fig. 12.3 that is used with your personal computer. It rolls on a small ball and has two or three buttons on the top. When you roll the mouse across a flat surface the screen sensors the mouse in the direction of mouse movement. The cursor moves very fast with a mouse giving you more freedom to work in any direction.



Fig 12.3 Key Board and Mouse

2. **Central Processing Unit (CPU):** The main unit inside the computer is the Central Processing Unit (CPU). This unit is responsible for all events inside the computer. It controls all internal and external devices, performs arithmetic and logic operations. Figure 12.4 shows the CPU device.

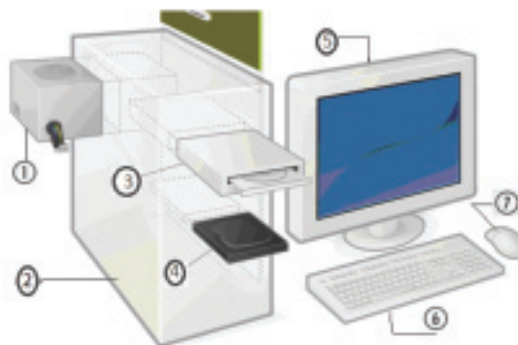


Fig.12.4 CPU Devices

3. **Storage Devices:** The CPU contains the basic instructions needed to operate the computer, but it does not have the capability to store the programmes or large sets of data permanently. Just like the human brain the computer has an in-built memory where it can store large amount of data which helps in processing arithmetic and logical operations and also holds programmes and the data being manipulated. This area is called memory or storage. Data can be also stored in secondary storage devices such as pen drives, which can be kept outside your computer and can be carried to other computers. Computer has two sets of memory, which are primary memory like RAM (Random Access Memory/Read-Write Memory), ROM (Read-only-memory) and secondary memory like Hard Disk (Local Disk), Optical Disks: CD-R, CD-RW, DVD-R, DVD-RW, Pen drive, Zip drive and Memory Cards.



E4. State the names of the components of the computer as shown in the figure below against the numbers indicated.



12.2.4 Types of Computer

You might have seen computers used in bank, railway station, and library and in other places. The memory, size and efficiency of these computers are different from each other. Computers can be classified on the basis of its working principles, size and brand. Different categories of computers which can be used in the classroom learning process are as follows.

- a) **Microcomputer:** Microcomputer is at the lowest end of the computer range in terms of speed and storage capacity. Its CPU is a microprocessor. The first microcomputers were built of 8-bit microprocessor chips. The most common application of personal computers (PC) is in this category. The PC supports a number of input and output devices. An improvement of 8-bit chip is 16-bit and 32-bit chips. Examples of microcomputer are IBM PC, PC-AT.
- b) **Mini Computer:** This is designed to support more than one user at a time. It possesses large storage capacity and operates at a higher speed. The mini computer is used in multi-user system in which various users can work at the same time. This type of computer is generally used for processing large volume of data in an organisation. They are also used as servers in Local Area Networks (LAN).
- c) **Main frames:** These types of computers are generally larger in terms of memory than the mini computers. They operate at very high speed, have very large storage capacity and can handle the work load of many users. They are generally used in centralised databases in big organisations like banking, insurance, defence and other such sectors.
- d) **Supercomputer:** They are the fastest and most expensive machines. They have high processing speed compared to other computers. They have also



multiprocessing technique. One of the ways in which supercomputers are built is by interconnecting hundreds of microprocessors. Supercomputers are mainly being used for weather forecasting, biomedical research, remote sensing, aircraft design and other areas of science and technology.

E5. The computer that you often see being used by others or you use for your own work comes under which type of category?

E6. In classroom learning which type of computer you need to use?

**ACTIVITY-1**

Find a computer and observe the different parts. Identify the keys on the key board and try to operate the system with the help of a computer knowing person.

12.2.5 Using the Computer

You have to work with the computer to use it properly. In order to use a computer you need to do the following by sitting with a computer :

- *Starting the computer:*
 1. Switch ON the Power Supply,
 2. Switch ON the CPU and,
 3. To Switch ON the Screen (Monitor).
- *Shutting down (Turning off) the Computer*

Before shutting down the Computer, close all programmes you are working as shown on the screen (monitor) at first. Then,

1. Click on Start button.
2. Click on Shutdown (Turn off Computer).

Then, on the monitor screen you find the following options (As shown in the pictures below):

- Standby
- Shutdown (Turn Off)
- Restart



Notes



Note: The options will be different from one system to another.

3. Choose 2nd option (i.e. Shutdown/Turn Off).
4. Click on OK.

Then, wait until the message “It’s now safe to turn off your Computer”.

5. Then, Switch Off the screen.
 6. Switch Off the CPU.
 7. At last, Switch Off the power supply.
- **Working with Microsoft Word:** There are several ways you can create new documents, open existing documents and save documents in word.

- *Create a New Document*

There are three different ways you can create a new document.

- Click the new document button on the menu bar
- Choose File/New from the menu bar
- Press Ctrl+N

- *Open an Existing Document*

Similarly there are three different ways you can open an existing document

- Click the open file button on the menu bar
- Choose File/Open from the menu bar
- Press CTRL+O on the key board

- *Renaming Document*

To rename the word document while using the programme,

- Select file/open and find the file you want to rename.
- Right-click on the document name with the mouse and select “Rename” from the shortcut menu.



- Type the new name for the file and
- Press the Enter key.
- *Save a Document*

Three different ways you can save your file.

- Click the save button on the menu bar
- Select file/save from the menu bar
- Press Ctrl+S on the key board.
- *Close a Document*

In order to close the current document, you have to select file/close or click the close icon if it is visible on the standard toolbar.

- ***Working with Power Point Presentation(PPT)***

In the classroom, you are familiar with the use of different charts, graphs, models and different instruments for making your classroom interesting and reducing learning difficulties among the learners. Now teaching through Power point presentation is taking an important role in the classroom and you must have basic ideas to develop power point slides and how to use it in the classroom.

a) *Starting the Microsoft Power point*

In order to use the Microsoft power point, first you have to click Start option in your computer than click Microsoft office. Here you will get different options like word, excel, power point etc. You have to just click in the power point option. If power point is already open or the box does not appear, than you have to select File/New from the menu bar.

b) *Working with slides:*

- Insert a new slide
- In the outline window, select the slide you want the new slide to appear after by clicking the slide's number.
- Select the Insert/New slide from the menu bar or click the new slide button on the standard toolbar.

Choose the page layout from the window and press OK.

Applying a Design Template



ACTIVITY-2

Now use a computer to

- (a) *Prepare a word file and save it in your name.*
- (b) *Rename three different word file with three different names.*



To add a design template or changing the existing one, select Format/Design template from the menu bar. Select the template and click Apply.

12.3 COMPUTERS AS A SOURCE OF LEARNING

You collect information on contents/concepts from different sources like text-books, reference materials, newspapers, television etc. You are mostly familiar with text-books, reference books and other print materials. In today's world you can get huge information from the World Wide Web (www) using the Internet. Let us understand about the Internet and the Web and how we can use them as sources of learning in the classroom.

12.3.1 The Internet and the Web

We generally consider the Internet and the World Wide Web (www) to be the same. They are closely related to each other and not exactly the same. There are differences.

- The internet is a decentralized global network of computers.
- The web is a collection of documents that you can access using the internet and web searching software. The web comprises of the vast content available over the internet.

Web sites reside on computers called Internet servers. When you are connected to the Internet, your web browser software can communicate with the Internet servers, ask them to send your computer a copy of the web page that you wanted to see. The Uniform Resource Locator (URL) you type or the hyperlink you click tells your computer which server to try to contact and which page you are asking for.

12.3.2 Internet based learning

Internet technology has made a great contribution to learning process in the classroom. You can use the Internet in your classroom mainly for three different purposes like:

- The internet as a technology of information;
- The internet as a technology of interaction;
- The internet as a technology of sociability.

The Internet as a technology of information allows you to bring large stock of data, references in any form (text, graphics, sound and visual). When you talk about internet as a technology of information, it has different purposes of use in learning like:



- Using the internet as an accessible library within which students browse different information more freely before or after the class;
- Using the internet to publish new kind of textbooks for students.
- Using the internet as the classroom with electronic white board and asynchronous discussion.

Suppose you are going to teach about global warming in your class. You can suggest different websites to your students related to global warming like www.nrdc.org, www.globalchange.com, etc. before or during the class for better interaction. Here the Internet is used for the purpose of collection of information during learning.

The Internet serves as a good medium of interaction and sociability among the students and the teacher. Web 2.0 technologies like wiki, Blog, Face book etc. is used for the purpose of learning. Here the Internet helps in collaboration, maintaining standards, decentralisation, and openness and evolving content for learning. Again consider teaching the topic on global warming. Your students can collect different aspect of global warming from the Internet and share it through web 2.0 technology. Here the Internet is used as collection of information as well as for disseminating the knowledge between the students.

Accessing Information from Internet: You can find a piece of information easily from the Internet if you know the address of the web-site exactly. If you have no idea about the web site, you can still find the information/materials by opening the web page and typing www.google.co.in on the menu bar. Then you will find a rectangular space below the Google page. In this space you just type in the key word about the information and click enter on the key board. You will find different related topics in the page. You just need to double click on the topic in order to see the entire topic. Again if you want to save the file for using it on later, you just go to file/save as/ name the file/type where you want save/save. Now your file has been saved and you can retrieve later without connecting to the net.

**ACTIVITY- 3**

Collect the information on the topic like fraction from the Internet, save it in your computer and send this file to your friends.

12.4 COMPUTER ASSISTED LEARNING

The use of Teaching Learning Materials (TLMs) in the classroom not only helps in teaching but also to create interest and curiosity among the students to learn in the classroom. This has been discussed in Unit 6 in the Block 2 of this course. The use of a computer in teaching learning for accessing information and for



making collaboration in the classroom has now taken an important role and is commonly known as Computer Assisted Learning (CAL). The purpose of CAL is to enrich the quality of learning. In this section let understand how a computer can be used in the classroom and the methods of Computer Assisted Learning (CAL) programme that you can use in your teaching learning process.

12.4.1 Modes of Computer Assisted Learning

According to the need and context of the classroom you can use computer in different modes. In the teacher centred classroom, instruction is structured and the learning is frame based. In this mode instructional material or programme is presented to the student frame by frame in a relatively fixed sequence without any remedial exercise. But with the developments in the computer technology you can present your teaching in the classroom in a number of flexible ways for meaningful learning to take place. The different modes of CAL programmes are as follows.

- **Drill and Practice Session:** This is the question-answer type program where the computer generates large numbers of exercises, evaluates responses, gives immediate feedback as to the correctness of the responses and sometimes hints on how to obtain the correct answers if the responses are incorrect. An example of a drill and practice program is, suppose you are going to teach the atomic number of elements and give an exercise to students for solving it. The atomic number is selected at random from a list by the program. If the student enters the correct element, the atomic number is removed from the list and another atomic number is presented by the computer. Atomic numbers which are not correctly identified does not get removed from the list so that eventually the student reprocesses the atomic numbers requiring the most practice. Properly written drill and practice programs help students commit to memory facts, rules and principles without which a deeper study of a subject is difficult.
- **Tutorial Mode:** In this type of program, information and explanatory material is presented in small segments followed by questions. If the students respond incorrectly, feedback according to the nature of their mistake is given. If the answer is correct, another segment of the explanatory material is generated. On the basis of responses made by the students, the program decides how rapidly material should be generated and how much should be covered. In this mode, computer is used to simulate the most visible part of your activity-to transmit knowledge and check whether the knowledge has been correctly transmitted. Generally this mode can be used successfully to teach subjects that have a checklist structure (e.g. solving linear equation, simplex method to solve equation etc.).
- **Data Analysis:** This type of CAL allows experimental data to be analysed and the result is printed out either in numerical or graphical form. A more



realistic approach to the study of certain topics is made possible with the appropriate program using either a built in set of data or, preferably, data collected and entered by the student. With one or more microcomputers in the laboratory, students can analyse and interpret their experimental data. Suppose in your class, you want to teach topics like central tendency, measures of variability, coefficient of correlation or graphical representation of frequency distribution the computer can be used for analysis, interpretation and representation of different data.

- **Simulation:** Computerised simulations are models or imitations of processes. Simulations present life-like situations that allow students to learn through experience and to take risks without suffering the consequences of poor choices. The students can study the effect of changing various aspects by observing the outcome of each case so as to develop an appreciation and the scope and limitation of a system. One simulation programme can be thought of as the water supply system in a city. The different aspects of the system which includes collection and storing of water in a large scale; putting the water mass under treatment through the process of sedimentation, colorination, filtration etc.; transporting water mass through distribution pipes till it reaches for human use. The whole process can be put forth in a systemised way through the computer programming in a dynamic way through simulation to have better conceptual clarity. Simulation programs are suitable for mathematics, social science and science where complicated and difficult topics, experiments etc. which are too costly or dangerous or too time consuming to investigate or difficult to replicate the real system in classroom situation.
- **Modelling:** Modelling involves creating, adapting or choosing a theoretical model to correspond with a natural phenomenon or a manmade system. This type of program is encountered more often at the higher levels of education. An example of this type of program involves finding the relationship between different aspects to form a functional unified whole. For producing a working model through the process of simulations students are able to gain some insight into the concept of modelling and some training in inductive thinking. An example of model in a simulated condition can be cited for better understanding:

Simulation in general is to pretend that one deals with a real thing while really working with an imitation. In operations research the imitation is a computer model of the simulated reality. A flight simulator on a PC is also a computer model of some aspects of the flight: it shows on the screen the controls and what the “pilot” (the youngster who operates it) is supposed to see from the “cockpit” (his armchair).

Why to use models? To fly a simulator is safer and cheaper than the real



Notes

airplane. For precisely this reason, models are used in industry commerce and military: it is very costly, dangerous and often impossible to make experiments with real systems. Provided that models are adequate descriptions of reality (they are valid), experimenting with them can save money, suffering and even time.

- **Information Storage and Retrieval:** Information in various forms can be readily stored and retrieved with a computer. With a large data bank, the computer holds great potential for providing a rich information environment (data base) which can be accessed easily compared to books or microfiche. Information stored in the computer can be easily updated, expanded and enlarged upon. This type of CAL program allows students to study topics which require access to large data bases which cannot be easily handled manually. However, this type of program, which is not widely used in schools at the moment, may be commonplace later on. In education, we are inundated with information especially at the higher levels. Teachers may need to teach their students to interrogate an information retrieval system efficiently in the future.

E7. Match learning points from column A with the appropriate CAL modes from column B:

A	B
1. Intensity of Earth quake	a. Drill and Practice
2. Forming groups according to socio-economic Status	b. Simulation
3. Problems on Fraction	c. Modelling
4. Information about Parts of body	d. Data Analysis
	e. Data Storage

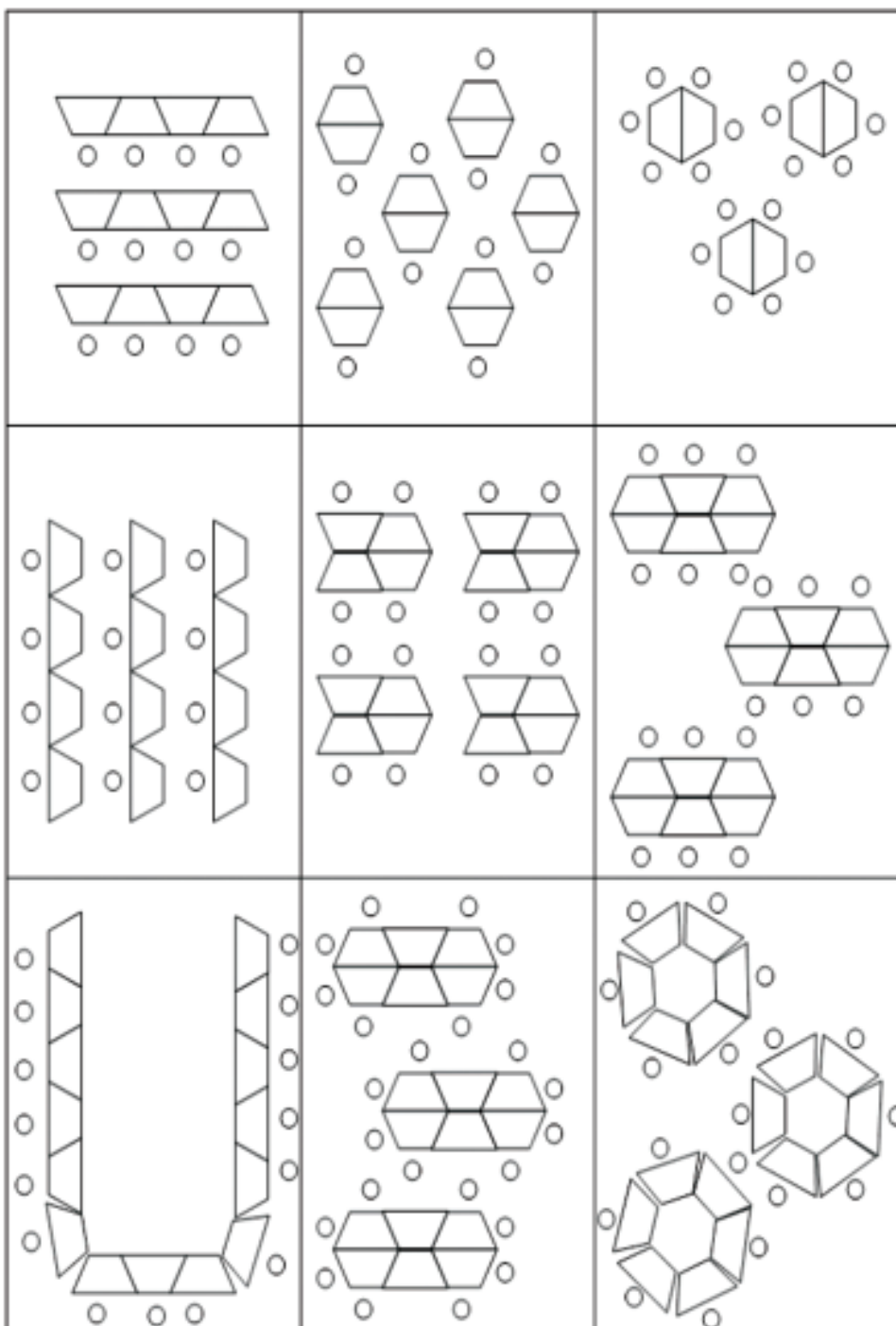
12.4.2 Planning for Computer Assisted Learning

Even if you have basic knowledge on computer and computer assisted learning, without planning you cannot successfully use the computer assisted learning. Let us consider the following different aspects that you need to take care, when you are going to use a computer in the classroom.

- **Stating the objectives:** In this step, you just state the objectives of the course/topic/lesson i.e. the concepts that you are going to teach. As you know when you select a particular mode of computer assisted learning, you must know the nature of the content and whether available computer facilities are suitable for the purpose or not.



- Identifying the space and availability of computer: Before you use computer in the classroom, you have to consider the number of students in your classroom and the no of computers available. Accordingly the size of the classroom and the availability of computer, helps to plan for the sitting arrangement. The possible sitting arrangement can be done as shown in Fig 12.5.





SITTING ARRANGEMENT OF COMPUTER ASSISTED LEARNING

- Selecting the modes of computer assisted learning: Based on the nature of the content, availability of tools of computer and the size of the classroom, you have to select a particular mode of computer assisted learning which will be suitable for facilitating learning.
- *Strategies for Implementation:* When you are going to implement a particular mode of computer assisted learning, you have to plan the strategies like- lecture strategy, collaborative strategy and self- regulatory strategy. In the *lecture strategy* the teacher uses the computer to present his/her teaching and there is no scope of students to use the computer. Here one computer can manage the class. In case of *collaborative strategy*, a group (4to5) of students are assigned to use one computer and teacher guides all the groups. In *self-regulatory* strategy, each one of the students use single computer including the teacher. Generally the self- regulatory strategy is better in the computer lab rather than inside the classroom.

12.5 LET US SUM UP

- Computer is an electronic device that takes raw data as inputs from the user, processes these data under a selected programme yielding the desired output which can be stored for future purposes.
- The computer system is divided into three separate units for its operation. They are:
(i) arithmetic logical unit, (ii) control unit, and (iii) central processing unit
- All the components of the computer can be categorised into two broad groups i.e. hardware and software. A hard ware component of the computer refers to the internal and the peripheral devices whereas the software gives the intelligence to the computer.
- The computer can be classified on the basis of its working principles, size and brand. These are micro, mini, mainframe and the super computer.
- The Internet can be used in different purposes in the classroom like collecting information, interaction and for the social networking.
- Computer Assisted Learning (CAL) are used in different modes like- Drill and practice session, Tutorial, Data Analysis, Simulation, Modelling and the Information storage and retrieval.
- A proper planning is necessary for the computer assisted learning in the classroom.



12.6 MODEL ANSWERS TO CHECK YOUR PROGRESS

- E1. Computer is called as data processor because it is mainly used for processing data for producing meaningful information
- E2. If storage system will not be there in computer, than you cannot save the data for the further uses
- E3. (i) A, (ii) C, (iii) A
- E4. 1.RAM; 2- CPU, 3- CD disc; 4- floppy disc; 5- Monitor; 6- Key Board; and 7- mouse
- E5. Microcomputer
- E6. Microcomputer
- E7. 1. b; 2. d; 3. a; 4. c

12.7 SUGGESTED READINGS AND REFERENCES

1. Criswell, E.L. (1989). The design of computer based instruction. New York: Macmillan Publishing Company.
2. Dean, C. and Whitlock, Q. (1988). A handbook of computer based technology. London: Kogan Page.
3. UNESCO (2002). UNESCO report: Information and communication technology in teacher education: A curriculum for schools and programme of teacher development. Paris: Division of Higher Education, UNESCO.

12.8 UNIT-END EXERCISES

1. Select a small unit from your subject. Try to develop different modes for CAL and discuss it with your friends.
2. Create a word file lesson plan from one of the topic and save the file in your topic name.
3. List out the input devices of the computer
4. What are the advantages of the Computer assisted learning in the classroom.