PATHOKROMEY SHIKSHONER KALA O BIGYAN

(Art and Science of Teaching in Curriculum)

School Education Department,

Government of West Bengal

State Council of Educational Research and Training

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Preface

The subject "Pathokromey Shikshoner Kala O Bigyan (*Art And Science of Teaching In Curriculum*)" has been organized as per NCTE's newly developed syllabus, 2014. The course of this subject is scheduled for completion of two years and is included in the curriculum of 'Diploma in Elementary Education (D.El.Ed.). The main objective of this curriculum is to transform the environment and methods of education as per the National Curriculum Framework for Teacher Education (NCFTE 2009). This transformation is absolutely necessary to keep up with today's rapidly changing society, environment and lifestyle. The revision of the syllabus and the annexation of the paper have mainly been made with this change in mind. It should be noted that the content of the book is by no means limited to written subjects. Only outlines and guidelines are provided in this.

The main objectives of writing this book are

a) To take a holistic view of various educational subjects.

b) To acquire knowledge about basic concepts in human nature, society, learning and goals of education.

c) To acquire knowledge about various components of education.

d) To form concepts between learning and teaching by the teachers.

e) To gain knowledge about different approaches to curriculum and child knowledge construction.

f) To acquire knowledge about school leadership, management, effectiveness and its quality.

This textbook is a joint research work of State Council of Educational Research and Training (SCERT, WB) and District Institute of Education and Training (DIET). Due to lack of suitable textbooks for the new D.El.Ed course in Teacher-Education Institutions, this body vide Government Instruction 712-Edn (CS)/8T-17/79, dated 21.05.1980 Sections (iii), (iv), (viii) and (x)) undertook and project called "Development of Teaching Clarity". The words that emerged emphatically from the teachers-trainers present at each of these project workshops were - "D.El.Ed needs the right teaching and learning materials".

This book is the result of tireless efforts of every staff member of State Council of Education Research and Training (SCERT), and various District Education and Training Institutes (DIETS). The content of this book was developed through a number of processes. All efforts will be worthwhile if it is welcomed in the teacher-education programme. Our next generation will be properly educated if this process is transformed through the application of "Pathokromey Shikshoner Kala O Bigyan (*Art And Science Of Teaching In Curriculum*)" in the field of education. The content prepared through initial application and research is then subjected to final editing. It is through these stages that this book emerged today.

The contributions from Dr. Sonali Chakraborty, Sivanath Sastri College, Kolkata in writing the original Bengali version of this book is commendable..

Under requests from various TEIs with medium of instruction other than Bengali, SCERT, WB, subsequently embarked on a project to get this body work, amounting to 10 titles in all, to get translated in English, Urdu and Santhali. The translation work was taken up in teams under the supervision of the Director, SCERT (WB), and under coordination of Shri Subrata Kumar Biswas, Research Fellow, Grade-

II, SCERT (WB). The team for transcreating the present book constituted of Sri Janajit Chakraborty, Senior Lecturer, DIET Jalpaiguri and Smt. Soma Chatterjee, Principal, Chittaranjan Teacher's Training Institute, Kolkata.

Since this work of translation work can best get critiqued while in use by the practicing teacher educators and the D.El.Ed trainees, any constructive criticism by way of suggestion to improve the present book is heartily solicited.

The effort gone into this transition will get its due recognition if this book meets the requirements of its readers.

Dr. Chhanda Ray
Director, SCERT (WB)

CC-04: Pedagogy Across Curriculum

Full Marks:100

External:70; Internal:30

Pass marks: 40% of full marks in each of External and Internal evaluation

Student Contact hours: 90 hours

Objectives:

- To ensure quality instruction and develop learners with good understanding of the contents and their inter and intra relationship.
- To develop an understanding of the concept of Pedagogy across Curriculum
- To facilitate an understanding of the historical and philosophical perspectives of pedagogy across curriculum
- To develop an understanding of how children learn and the importance of socio-cultural, economic and political context in the process
- To clarify differences between interdisciplinary and multidisciplinary approaches and generate awareness about the importance of interdisciplinary approach for integrated teaching-learning at the elementary level
- To develop a clear understanding of the practice of pedagogy across curriculum for application in teaching elementary school subjects like L1, L2, Mathematics and Environmental Science
- To engage the student teachers in various activities related to Pedagogy across Curriculum that are to be assessed continuously and comprehensively.
- To understand and apply the appropriate mode of transaction of the content materials to make learning situation vibrant and active.

Unit 1: Pedagogic Practice and Process of Learning **Class-6 hours**

- Concept of Pedagogy and Pedagogy across Curriculum – meaning, features, objectives
- Critical understanding of the process of concept-formation
- Constructivist approach in pedagogy across curriculum
- Aspects of child-centric education and creation of non-intimidating environment for knowledge construction

Unit 2: Historical and Philosophical Perspectives of Pedagogy across Curriculum Class-5 hours

- Philosophical bases of pedagogy across curriculum
- History of the development of pedagogy across curriculum
- Constructivist approach and pedagogy across curriculum
- Development of skills through pedagogy across curriculum – nature, principles, significance
- Pedagogy across curriculum for inclusive education

Unit 3: Integrative Teaching in Pedagogy across curriculum **Class- 5 hours**

- Concept of Integrated teaching-learning
- Concept of interdisciplinary approach – difference with multidisciplinary approach
- Significance of interdisciplinary approach in integrated teaching at the elementary level
- Socio-cultural aspects in pedagogy across curriculum

Unit 4: Knowledge and Methods of Enquiry **Class- 5 hours**

- Concept of knowledge, information and their differences
- Concept of Knowledge Construction – case examples from elementary school subjects
- Methods of Enquiry, different types of thinking – scientific, mathematical, social, higher order thinking
- Relation between knowledge ,curriculum, text books, learners and pedagogy Basic tenets of enquiry based learning, contextualization, project based learning

Unit 5: Learner and their Context **Class -6 hours**

- Alternative frameworks of children's thinking
- Everyday concepts and situated cognition
- Pedagogy across curriculum for contextualization – language, social relations, identity, equity, rights and their relation through education
- Eradication of Child and adult misconceptions

Unit 6: Use of ICT for Pedagogy across Curriculum **Class -10 hours**

- Role of ICT in education
- Use of ICT for pedagogy across curriculum
- Capacity development in the use of ICT for integrated teaching
- Significance of ICT in catering to diverse needs of children with special needs in an inclusive classroom

Unit 7: Integration of Values and Performing Arts through Pedagogy across Curriculum

Class- 10 hours

- Value education- importance at elementary stage, integration through pedagogy across curriculum
- Types of performing arts , their relevance in education at elementary level
- Integration of performing arts – principles, significance, strategies
- Integration of performing arts for learner motivation with special reference to inclusive setting

Unit 8: Pedagogy across Curriculum for Class I-V **Class -15hours**

- Content analysis for teaching in Interdisciplinary approach
- Plan and Design of relevant teaching learning material for pedagogy across curriculum- Year Plan, Unit Plan., Lesson Plan, Writing Instructional Objectives, Instructional Aids, Instructional Strategies.

- Concept mapping and integrative teaching for inclusive classroom

Unit 9: Pedagogy across Curriculum for Class VI-VIII **Class -15 hours**

- Content analysis for teaching in Interdisciplinary approach
- Plan and Design of relevant teaching learning material for pedagogy across curriculum- Year Plan, Unit Plan., Lesson Plan, Writing Instructional Objectives, Instructional Aids, Instructional Strategies.
- Concept mapping and integrative teaching for inclusive classroom

Unit 10: Evaluation **Class -15 hours**

- Monitoring the progress during and after lesson
- Follow-up activities- Maintenance of student profile, reporting progress
- Diagnosis and diagnostic tests in L-1, L-2, Mathematics and Environmental Science
- Remedial Measures.

Mode of CurriculumTransaction:

Theory based study with relevant examples from text books of different subjects of the classes of the elementary level. Use of ICT in Unit 6 and 10 should be practical based and student teachers must actually learn to use ICT for pedagogy across curriculum. Units 8 and 9 must be practical oriented as well. Collating and analyzing child and adult conceptions of socio-cultural and natural phenomena for transaction of pedagogy across curriculum must be done.

Internal Marking Scheme:

- Content Analysis -10
- Demo class[pedagogy across curriculum]-10
- Development of Teaching learning material for integrative teaching-5
- Use of ICT for pedagogy across curriculum-5

External Evaluation : External Examination hour-3 hours

External Marks =70

Content

UNIT 1

Basic Concepts of Pedagogic Practice

1.1 Introduction

Ryan and Hornbeck (2007) have defined pedagogy as "art and science of teaching". The teachers must have clear idea about the concept of pedagogy and application of pedagogy so that it can positively influence the teaching _learning process and learning ability of the learners. The teacher must realise the use of pedagogy in the learning process. All teachers use innovative method for teaching and such strategies, innovation and ideas can be summed up as pedagogical practices.

This unit deals with the concept of pedagogy, the relationship between pedagogy and curriculum and the use of pedagogy across curriculum.

1.2 Objectives

At the end of this chapter students will be able to:

a) Explain the concept of pedagogy

b) build up the relationship between pedagogy and curriculum

c) can use the concept of pedagogy in curriculum

d) Understand the process of concept formation and apply

e) Apply the principles of constructivism in curriculum

f) realise the idea of child centric education and apply

g) understand the conditions for knowledge formation of children and create the environment for such learning process

1.3. Concept of Pedagogy and Pedagogy Across Curriculum— Meaning, Nature, Features, Objectives

1.3.1 Pedagogy: Concept:

Example:

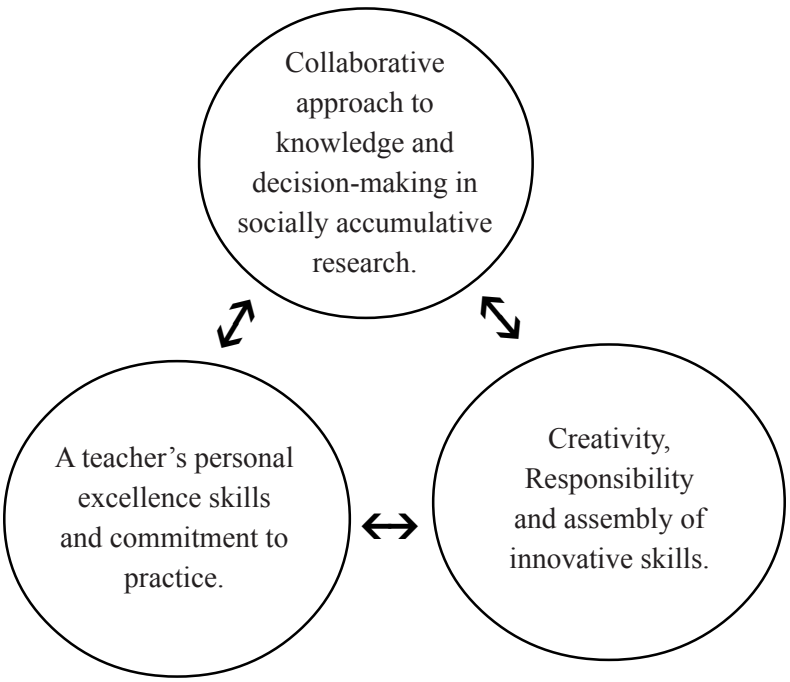
In the workshop on environmental studies, the resource person has written the topic on the blackboard "interactive teaching learning" and asked the participants to express their ideas and opinions about the topic. Then he has written down all the words uttered by the participants and so the blackboard was filled with many different words which represented the ideas of the participants. Then the participants exchange their ideas. on each key words and hence in the workshop, the participants have learnt the concept and application of Interactive teaching and learning.

Brainstorming is actually what the person did in developing the concept of Interactive teaching learning in the above example. That ensured participatory learning of the workshop participants.

In fact, this practice of classroom brainstorming is an applied example of pedagogy. A teacher can apply one or more of these methods singly or simultaneously depending on the subject matter, learning environment, level of students, etc. In fact, to achieve the objectives of the curriculum, the methods that the teacher can scientifically apply can be called Pedagogy.

Pedagogy or the overall management of teaching and learning is formed by the values, political policies, social and cultural influences of a country. Pedagogy is an integrated form of Science, Craft and Art, which is social and structurally acquired knowledge. It depends on the professional skills and efficiencies of the teacher.

The concept is illustrated as follows.



1.3.2. Practice of Pedagogy in Lessons. Features and Purpose (Pedagogy Across Curriculum: Features and Objectives)

Curriculum is a structured program or set of activities aimed at achieving the educational objectives of a country.

Curriculum is simply a student's overall institutional experience. Pedagogy is any type of interaction or interactive activity between the teacher and the student that ensures the student's learning or acquisition of competence.

Pedagogy and curriculum are related but distinct. It can be thought that curriculum is a road and pedagogy is how you reach the destination through that road. That is, the curriculum explains the 'What' i.e. the possibilities of education. Pedagogy, on the other hand, explains the 'How' - that is, how the teacher will help the student. It therefore follows that the application of well-thought-out, specific pedagogy across the curriculum is essential to ensure participatory learning for all students.

Characteristics of active pedagogy across the curriculum according to Chris Husband and Jo Pearce (2012) are as follows:–

- Which gives utmost importance to the views of the students.
- The effectiveness of pedagogy depends on the behavior of the teacher, his values and sense.
- Pedagogy addresses both long-term goals and immediate goals.
- Students' knowledge construction is always based on the student's prior learning and experience.
- Curriculum-based pedagogy helps the student to cross the Zone of Proximal Development to meet his/her achievements.
- Functional pedagogy applies many techniques that can be in the process of involving all students, learning through group formation, individual activity, etc.
- Effective pedagogy of the curriculum encourages students to think deeply, where interaction and deliberate questions are very valuable.
- Active pedagogy always includes student assessment. Appropriate pedagogy gives due importance to the equitable perspective of students' learning and can also do justice to the individual needs of each student. According to educator Lovat (2003), Pedagogy is a highly complex blend of theoretical understanding and practical skills. It maximizes student learning.

The overall objective of pedagogy can be summarized as follows-

(a) Pedagogical practice clarifies the teacher's understanding of the possible ways in which students learn and helps the teacher to continuously expand his knowledge.

(b) With the learner at the centre of learning, the concept of appropriate pedagogy teaches the teacher to give importance to the learner's individual preferences and needs.

(c) Appropriate pedagogic practices allow students the necessary time to develop and express their own ideas and interpretations.

(d) Pedagogy helps to expand the learner's current, acquired abilities to new experiences based on his interests, his perspectives and his acquired values.

(e) Ensures a relevant environment to the learner for active learning by the learner himself (f) Appropriate pedagogy not only values the relevance of diversity in the classroom, but also encourages deep practice of them.

(g) Ensures how the teacher can participate in the interaction with the student in a more deliberate way.

(h) Helps in determining the overall pace and method of learning in and out of the classroom.

(j) Appropriate pedagogical practices help in developing respect for mutual cultural characteristics among students in the classroom.

(k) Creates learning opportunities and ensures learning for children who are differently abled. (c) Above all, appropriate pedagogy helps him to acquire the social skills necessary to become a citizen of the 21st century world

Think - 'Involve all' is a big challenge in the classroom, what kind of practice you should do in the classroom?

By practicing what kind pedagogy, you as a teacher can ensure the participation of all students.

1.4. Critical Understanding of the Process of Concept Formation

It the teacher writes the word bird on the black board in the classroom, the type of mental image created in the students is very specific. Some specific features become apparent like body covered with feathers, strong eyes, - two wings with which the bird can fly etc. In this case Students don't have any image of snake, tiger, frog, or chair, table. That is, the bird is a specific single concept that cannot be mixed with any other concept.

Let's say 'Democracy' is written on the board, although democracy has no outward appearance like a bird, students can feel what democracy is. The concept of democracy becomes clear in terms of where a democratic system as a political social process differs from an autocratic state. So it can be said that a clear overall idea is developed in us about an event, a process and that is concept.

In other words, Concept refers to a general category rather than a specific object, person, event. For example, if honesty is a concept, it refers to a specific human religion value rather than a person.

1.4.1. Process of Concept Formation

How do people think? How do people understand?

The method of concept formation is hidden in the answer of these two questions. Deep understanding in cognitive science

Explains that each individual concept exists as a mental image in students and they are related to each other. In fact, rational and meaningful mental image about any material, event, process is created within student and that is concept.

As the generalized mental image is created, so the concept According to Esther L Zirbel, Concept Formation in students can occur in the following stages—

(1) Identification of new information - When students respond to specific stimuli, the information about this new stimulus is accepted at the neurological level.

(2) Identification of new information - This stage depends on the individual variation of the learner. The individual tries to relate or combine this new experience with his previous experience, or else leaves this information as dreamlike memory if he has no previous experience with it.

(3) Evaluating and Accommodating the New Information - Individuals integrate experience and information with previous ideas in such a way that a new idea emerges, and may change the preconceived notions as necessary.

(4) Acquiring Fluency This initial mental image or neural image is weak and vulnerable in nature, that is, sometimes the learner may confuse himself about the newly formed concept. In this case, by repeatedly dealing with similar problems and through gradual practice, these newly formed concepts become embedded in the student's general thought process.

The following can be an example of this imaginary diagram, with the help of which concepts are developed among the students

A student at the same time can see the images of a shark and Dolphin.

If asked to determine the relationship between them, the following possible path can be taken. A mammal is an organism that has certain common characteristics. Again, despite being vertebrates, fishes have some common characteristics. Both sharks and dolphins are vertebrates, aquatic and similar in external or physical characteristics. Initially, both appear to be similar and belong to the same group. But serial analysis of the characteristics of these animals may help us to build up concepts regarding fishes and mammals.

The concept can be developed about fish class and manuals.

Think about it, 'air pressure is also a concept challenging to develop among students. Think of the possible types of concept maps that can be developed to develop this concept.

1.5. Constructivist Approach in Pedagogy Across Curriculum

1.5.1. What is the curriculum?

The curriculum is designed for the overall development of the students. Through a curriculum national expectations, ideals and objectives of education are reflected. The experience a student gets from attending annual sports competitions is also related to the overall development of the child and is part of the curriculum.

Syllabus in simple words is a written plan, which includes the following topics-

- Objectives of children's development and education.
- Experiences through which students will achieve those objectives.
- How teachers and parents will help children to achieve this goal.
- The type of materials and infrastructure required to fulfill the learning objectives.

The pedagogical strategies that teachers use to achieve the learning objectives in a lesson are based on specific pedagogical philosophy and theory.

Behaviourism, Cognitivism, Constructivism, and other relevant concepts are prevalent in pedagogic practices across the curriculum. At present, in almost all countries of the world, more importance has been imposed on Constructivism as an applied educational philosophy and theory. The policies. adopted in the national sphere in our country have also given more importance to constructivism.

1.5.2. Constructivism

Epistemologically constructivism is learning as meaning making theory which explains how people learn. Several theories of learning can be subsumed within the constructivist concept. Constructivism from a social perspective is the joint effort of the learner and the teacher through which new ideas are developed in the learner.

Experience is learning, so the learning process is multidimensional. As the child grows in size, the various experiences he goes through, each of these experiences completes his world of knowledge, i.e. rebuilds it. In simple words, the child's knowledge is reconstructed through the assimilation of experiences gained from all areas of the world around the child e.g. his family, classroom, wider society, etc. Without going into a very long discussion in this area, it can be said that when the child is exposed to new experiences with already acquired knowledge and ideas, the reconstruction of new knowledge as a result of joining new ideas with previous knowledge and ideas happen and it is the key word of constructivism. Constructivism can be interpreted from various perspectives, but in terms of recentness in the current institution-based education system, intellectual construction, social construction, these two perspectives can be given the most importance.

Simply putting it, constructivism facilitates meaningful learning. The core philosophy of constructivism is- (Tobinand Tippins, 1993)

(a) Learning is a self directed process

(b) Instructor or Teacher is facilitator

(c) Learning is a socio-cultural process

1.5.3. Constructivist Approach

in Pedagogy Constructivism always moves from teacher-centered pedagogy to child-centered pedagogy, while the student's participation in this active and knowledge- building process depends on the successful planning of the teacher.

Let's say in class 3,in science class students need to know about a village. In this case, instead of providing any direct information about the natural identity of the village, the people, their professions and culture, the teacher takes the students to a village and teaches them the techniques of how to observe the village and exchange ideas with the students about the village and finally instructs students to verbalize and write about experiences-the experiences that students gain are their own constructions. Constructivism is applicable in teaching language, sociology, mathematics, science, any subject.

The subject, the age of the students, the level of prior knowledge, the geographical and social environment they live in, expected available resources may be helpful for a teacher to determine his/her pursuance of specific pedagogical methods in the classes.

Following methods are practicable:-

(a) Inquiry based learning - The teacher can plan and encourage and stimulate the students to solve an identified problem. Students can draw conclusions through questioning, problem analysis, inquiry, data-gathering, data-analysis, data organization and causal interpretation of results. Inquiry learning helps to apply and develop various skills such as creative thinking, self-regulated learning, communication skills, etc.

(b) Problem based learning - This method of pedagogy is a student- centred learning system which is usually organized through a small group of students. Students acquire specific skills and knowledge by solving a specific real-world problem. Problem-based learning also strategizes the application of inquiry. Through problem-based learning —

- Cognitive flexibility is achieved in students' thinking.
- Basic problem solving skills are acquired.
- Ability to self-regulated learning is acquired.
- Ability to collaborate and interact in team is acquired and
- Skills are acquired to stimulate oneself from within.

(c) Collaborative and Co-operative Learning Curricula should also emphasize the developing intellectual level of students in the practice of constructivism. According to social constructivism (Vygotsky's Constructivism) a group of students with different abilities according to the plan would be provided with an authentic learning environment and authentic tasks so that the students can progress to the learning goal through mutual discussion, argumentation, explanation collaborative etc. By mutual cooperation, by dividing the responsibilities among themselves in carrying out specific experimentations or tasks (Co-operative) students can acquire learning skills. The teacher can adopt any kind of pedagogical technique as per his convenience, but it is necessary to keep in mind that --

- Learning is important than teaching.
- Learning plans should be according to students' individual learning styles.
- Construction of knowledge is important, not reproduction of knowledge.
- Learning should happen through meaningful problems.
- Learning involves Analyzing the present in relation to past experiences.
- Learning is to develop a number of fundamental methods, attitudes and skills in students
- Learning is to transcend the content presented to students.

1.6. Aspects of Child Centric Education and Creation of Non-Intimidating Environment for Knowledge Construction

In terms of child-centric education is education for the country or for the society or for the child? Will the child be taught according to the needs of the society or the educational plan and method would be made according to the needs of the child?

The debate has been going on for a long time. From Dewey to Rabindranath, everyone spoke of child-centered education. In the current context, we can use the term Learner Centred instead of the term Child-Centric, keeping in mind the primary, upper primary, level of education.

Although education philosophies agree that education should be child-centered or learner-centered, the challenge is how to make education child-centered at the school level. It is very difficult to make teaching child-centered or learner-centered unless appropriate pedagogical strategies are adopted. Education at the school level is mainly governed by two main factors: strong curriculum and teacher's attitude. If active role of teachers or the pedagogic strategy is faithful to the written curriculum, otherwise if the pedagogic strategy is following the teacher's perspective then learning teaching can not be student-centric. Their student's individual interests, general tendencies, learning-techniques do not gain importance.

In view of this discussion, the main challenges in teaching child-centred and learner-centred pedagogy are-

- Traditional education learning pedagogy techniques are so broad and deep-rooted that it is difficult for the teacher and student to cross over especially the concept of imparting knowledge from the teacher to the student.
- Although the curriculum is based on the idea of pedagogical techniques based on constructivism, due to the lack of experience of students, lack of appropriate training and lack of counseling, this child-centered pedagogy is either not applied in practice or is applied mechanically.
- Age, intellectual level, socio-economic level and cultural diversity of students in the classroom is a major barrier to child-centered pedagogy.
- Although recently opportunities for practising child-centric pedagogy has expanded due to continuous development of technology and intensive research in the field of pedagogy yet attitudinal limitations of the educational stakeholders and lack of approach, positivity and efficiency of syllabus-composers and teachers are major hindrances in the path of child-centric education.

1.6.1. Pedagogy of Child Centric Education (Pedagogy of Child Centric Education):

Students learn best when-

(i) learning environment is collaborative and creative

(ii) When in Learning Environment there is student autonomy, self-reliance, interdependence among students, then students are stimulated to learn from within.

(iii) Curriculum are effective when they value the learner's needs, his interests and his social and cultural context

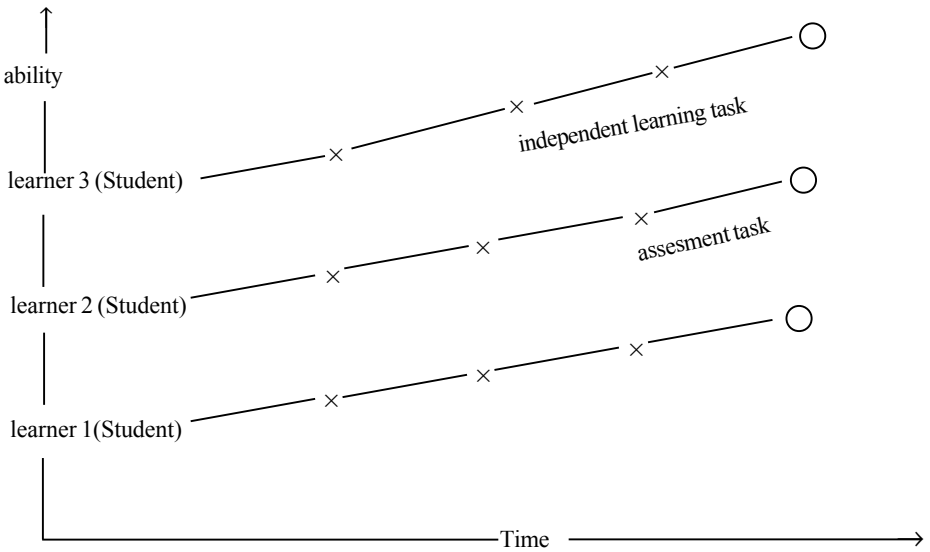
(iv) When the learning environment frees them from boredom and presents them with a challenge that can be met through reflection and application.

(v) Assessment of each student's learning progress lies within the teaching learning strategy.

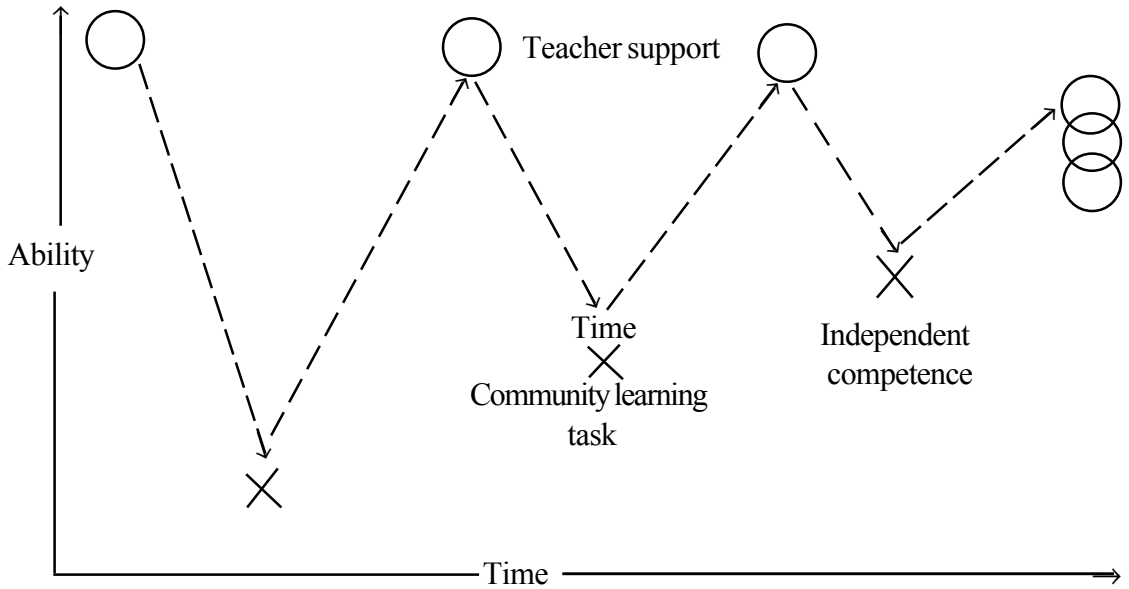
(vi) When student learning is not confined to the classroom curriculum, it can be linked to methods in the context of the larger society outside the classroom.

Traditional pedagogic practices which are teacher dependent and which are based on 'Outside in' i.e. imposed on the learner from the outside must be overcome by the child's own natural development or the philosophy of 'Inside out' (Piaget, 1928).

Instead of transitioning each student to a desired level, scaffolding each child is based on his or her own interests and abilities is the ideal child-centered learning pedagogical model. Each child in this evolving practice of pedagogy is at the center of his/her own learning strategies. It can be explained as 'Incremental learning model'. In this kind of practice, the student acquires learning skills individually or in groups according to his ability, which is evaluated through formative and summative methods. In this context, the evolutionary model of academician David Rose (2005) can be referred.



The learner learns by himself but his learning always takes place in a social context. The classroom is a miniature version of society. All the students in the classroom start learning something as a group. In final Stage development each student acquires specific skills according to their own learning ability. Initially the teacher provides similar learning support to the students in the classroom. Finally, each student is promoted to a general level according to their own interests and abilities being provided with learning support tailored to their needs. The following Scaffolding learning model (Rose 2005) articulates the pedagogic process of learner-centred social constructivism.



Teachers can adopt pedagogical strategies based on the student's economic, social and cultural environment, characteristics of institutions, availability of resources, etc., which will ensure student-centered learning.

1.6.2. Creating a free environment for knowledge creation

Fear is the main barrier to a child's education in school. Fear of the environment, fear of person, which gradually becomes learning phobia. A primary condition for learning is for students to feel at ease in school without fear. The National Curriculum Framework 2005 and the National Curriculum Framework for Teachers 2009 has established theoretical rationality of fearless construction of knowledge. R.T.E Act 2009 legally recognised child's right to freely construct knowledge in a trauma-free environment.

The teacher has to adopt certain strategies to ensure the free construction of knowledge in a fearless environment. The teacher's all work that ensures students' free knowledge construction is free knowledge construction pedagogy. Socio-cultural approach of learning emphasizes social and cultural development of the child. In schools, the teacher himself is generally a source of fear to the students. The classroom environment is also a source of fear in the school environment. There is also the fear of exams. So, the free learning and knowledge construction of the student is disrupted by chasing test marks instead of acquiring skills.

The teacher should adopt such a pedagogical strategy in applying the curriculum, so that students first develop respect for each other's language, culture, and religion, and students learn to value their own opinions as well as others' opinions in life practice, that is, school will become an ideal place to practice democracy.

The learning environment should be such that

- Children are developed as unique persons with self-identity and self-esteem.

- Would develop in them the sense that they belong to a social group.
- Children can communicate openly about their family and culture.
- Children should think of themselves as part of the larger society outside the school and gain an understanding of its geographical expansion, characteristics, population.
- Students feel comfortable voicing their opinions and becoming part of the decision-making process that affects their lives.
- They understand the characteristics, norms and limitations of desirable social behavior. * They should exchange ideas with others, cooperate with each other, share responsibilities, interact with others for solving disagreements and crises.
- Children learn to see themselves as learners and can determine the direction and pace of their own learning.
- Students become capable for satisfying their eagerness and become able to persistently take responsibilities.
- Their learning experiences should be based on their personal interests and learning should be related to their family, social and cultural lives. Students should be stimulated in such a way that they can reflect on learning progress and they can evaluate their own achievements.

A student's free knowledge construction largely depends on the teacher's awareness and views on expression and the teacher's teaching skills. The teacher can practise these appropriate pedagogical techniques according to the need and situation, so that the students can freely construct knowledge in a fearless environment.

1.7. Summary

This chapter attempts to give a basic idea of pedagogy. It is certain that a dynamic curriculum instead of a rigid curriculum creates opportunities for appropriate application of pedagogy. In a developing country like ours, no philosophy of elitism can have a place in education. Education is for all So the teacher should be aware that the pedagogical techniques practiced by them are conducive to the learning of all students.

Instead of blindly applying a pedagogical strategy, the teacher can change the pedagogical strategy. At the present time, Constructivism is given utmost importance in learning all over the world. But it is also certain that no single educational philosophy or teaching strategy is complete by itself. According to the situation and requirements, multiple educational philosophies and strategies can be applied at the appropriate level by the teacher as per his discretion.

It is undeniable that a teacher who is not a student himself can never be a good pedagogue. Simply gaining experience, through continuous research, a teacher can sucecssfully practise and apply curriculum pedagogy.

1.8. Unit End Exercises

(1) Proponents of social constructivism are - Piaget/Watson/Freud/Vygotsky

(2) What is the difference between curriculum and pedagogy?

(3) Explain the differences regarding concept formation process:

(4) Discuss the application strategies of constructivist practice in pedagogy:

(5) Explain the concept of pedagogy.

(6) What is the relationship between pedagogy and curriculum?

(7) What are the objectives of pedagogical practice in the curriculum?

(8) What does constructivism mean?

(9) How does Constructivism differ from Objectivism.

(10) Discuss strategies for practicing constructivism in the lesson.

(11) Make Lesson plan related to constructivism by selecting any one subject of class VI to VIII

(12) What is meant by Concept?

(13) Mention the stages of formation of concept.

(14) What are the major problems in practicing child-centered or learner-centered pedagogy?

(15) In what kind of learning environment do students learn best?

(16) Explain Learner-Centered Learning using the Pedagogical Strategy Model of Social Constructivism.

(17) what are the barriers to children's fearless free knowledge construction at the school level?

UNIT 2

Historical and Philosophical Perspectives of the Practice of Teaching science in the Curriculum

2.1. Introduction

Curriculum is a set of activities that help each person involved in learning-teaching to achieve his/her goals. There are several bases or perspectives of this huge activity. It can be said that the curriculum is built on several pillars and each perspective is interrelated with others. With these perspectives, curriculum can be modernized and adapted accordingly.

2.2. Objectives

The main objectives of this unit are —

- Communicate to trainee-teachers the foundations of pedagogy in curriculum practice.
- To help them to apply knowledge in the classroom with a new constructivist perspective.
- Help them to attain mastery of skill development techniques.
- Help them to gain ability to implement inclusive education in the classroom.

2.3. Philosophical Bases of Pedagogy Across Curriculum

2.3.1. Philosophy and Curriculum:

Philosophical practice helps us align our personal beliefs and values with how we perceive the world around us and how we define what is important to us. Social and institutional aspects of education

are affected as a result of philosophical thinking. The meaning of philosophical practice of education for curriculum development is Curriculum is a component of education, philosophy influences this component and determines the long spread. Those charged with making educational decisions and its substitutes regarding curricular must be clear about what they are believing. If our beliefs are not clear, our curriculum will be unclear. An important step in developing personal philosophy regarding education is to understand the various options that have emerged over the years.

Here we discuss four important philosophical attitudes that still influence curriculum development

- Idealism
- Realism
- Pragmatism
- Existentialism

The content to be applied for instruction will be centered on the values of human life and its application. Idealism is not a method. Human behavior is emancipatory when human behavior conforms to natural and social norms. So the value development of the student is possible through emancipatory/ rational approach.

- **Idealism**

Idealism is an ancient theory that has been practiced since ancient times in Greek and Indian philosophy. The main belief here is that whatever is being manifested is a reflection of our thoughts or inner self. Man has an eternal existence beyond the body, mind, intellect, whose search is the ultimate purpose of human life. Although material knowledge of all things in our external world helps in this quest/ search, gaining knowledge of things and material is only a preliminary attempt. In Indian philosophy, ignorance is called aparavidya and self-knowledge is called paravidya. That is, according to prophetic philosophy, people will be able to go beyond knowledge related to body, mind, material and would feel his/her self in great cosmos through real educational practice. One can feel the vastness of his existence. And the laws of nature and society are only the first step in attaining this knowledge. Through this self-realisation man differs from animals.

If this ideology is given importance in the selection of curriculum, special functions and content should be indicated. Activities that practice the larger values are therefore included in the practice of idealist curriculum. A method of reasoning that uncovers material through reasoning helps to practise the idealist curriculum. The importance of body, mind, intellect, ego can not be ignored while transcending these. One has to fulfill his/her own needs from childhood following each subject. Eg - Physical exercise helps to maintain health. Knowledge of natural phenomena makes the mind curious. Subjective reasoning facilitates sophisticated practice of intelligence self-judgment in relation to the environment and the world appeases the individual's ego and forms self-concept. As a result, the development of a complete human being is possible. Therefore, physical education, mathematics, logic, history etc. are all included into idealist syllabus.

This thought is very much effective in shaping modern values, that is why various curricular activities are important in human development. Modern constructivism greater emphasis on data analysis and critical thinking than on informative knowledge of students.

- **Realism**

Realism emphasises on acquiring various knowledge about subjects and objects. So the student will learn by directly experiencing the world around him. Knowledge of various subjects is gradually enhancing in regard to. The student also needs to be aware about these and practice them so that he can add some to the repertoire. Therefore, subject-specific practice is one of the hallmarks of a curriculum based Realism. Also, like the idealist, Realist also emphasised eternal values that would help in gaining experience.

- **Pragmatism**

A comparative discussion of the traditional philosophies shows that Pragmatism emphasises on change, process and relativity rather than idealism and realism. This philosophy suggests that the value of an idea stands on the actual results. These are related to the goals which focus on the practical aspects of learning and teaching. According to this philosophy, learning occurs as an individual reacts to the environment. It is based on interaction and interaction is natural variation. In this sense whatever be values and ideals, these support the mainstream. Then onwards next social development evolves.

We will see how pragmatism influences curriculum design.

According to pragmatism the curriculum will be designed in such a way that the student will think critically. Therefore learners must be naturally innovative as they solve problems. This activism will help them to widen the horizon of knowledge and to restructure their experience keeping pace with the changing world. In this case, the teacher's job is not simply to impart information, but to compare situations. Then the student has direct experience and opportunity to grasp the experiences of the world. By discussing these basic philosophical attitudes, it can be said that they have influenced curriculum development. Fourth there is another form of philosophy, which we will now discuss.

- **Existentialism**

What this doctrine emphasizes is that there is no value apart from humans. This is how people choose gets independence to select and then becomes responsible for the outcome of that selection.

According to this philosophy, the student has to choose from many situations, i.e. students should be given freedom in what they want to study. This philosophy emphasizes that learning is based on observation and facilitates understanding of personal feelings and personal reactions. What the student perceives, he learns through method and respects. An existentialist course would therefore be full of experiences and subjects would emphasize their own philosophical discourse, self- revealing wisdom, and exemplify emotion and intuition.

Most educators today say that curriculum should be varied and should focus on individual needs and interests and learning should be personalized. We can make this philosophy as the basis of open distance education.

In this case traditional Curriculum will become obsolete.

Curriculum development involves bridging the gap between student needs and curriculum, and it is inevitable to rethink about society and curriculum content.

In this case the work which is necessary should always be done first.. In this sense, social change demands a change in the ideals of education. From the above conclusions it is clear that pragmatism and existentialism in a broader sense continue to seek to broaden distance education. The above four philosophies initially explain a certain view of human nature and values of truth. From this we can understand that any ideology dictates curriculum development. The applicability of four philosophies underpinning a topic is given through an example —

Subject-Reading of Literary Text.

(a) A Narrative or Essay on a Character Vidyasagar (Ramendra Sundar Trivedi)-- Here the character of Vidyasagar is described, his great qualities are described.

The idealistic teacher will ask the students to discuss among themselves with special emphasis on these qualities. They can explain how they see those in someone they know. They would discuss what qualities among these they can acquire and what they can not. There would be discussions regarding the causes.

(b) Charuchandra Bhattacharya's Essays on Science - Here, direct experience about nature is discussed. The realist teacher will try to make the student experience the experiences described in the text and explain its principles which will include testing of student understanding.

(c) Poems of Madhusudan Dutta --"Bangla Vasar Prati", a poem rich in rhythmic variety. The pragmatic teacher will help to understand the structure of the poem, rhythm etc. The student will practice more rhyming poems with that type of rhythm after learning it. As a result, the student's activism will prevail here.

(d) Existentialist teacher will give the student freedom regarding subject matter and practise of analytical thinking on the subject is selected according to the needs of the student.

As seen from the above example, although each philosophy selects and implements curriculum according to its own perspective, none is undesirable in the education development process. Therefore, the effective application of all types of elements in the practice of applying the curriculum enriches the learning experience.

2.3.2. Philosophy in Curriculum Practice

The foundations of educational philosophy are found in idealism, pragmatism, realism and existentialism. Also, pedagogies that have a direct influence and help in curriculum development are:

- Perennialism
- Progressivism
- Essentialism
- Reconstructionism

- **Perennialism**

This philosophy supports the permanence of knowledge by reason. It has become permanent through values and have stood the test of time.

Spirituality is its foundation. Education is immutable, certain and eternally true. Essentially, this philosophy can be said to be be based on idealistic philosophy. This philosophy curriculum is subject oriented. It emphasizes language learning as well as literature, science and the arts. The teacher seems to be an authority on a particular discipline and teaching.

There will naturally be a common curriculum and there will be a small system for choosing optional subjects for all students It takes students through school and college courses and others through vocational courses.

- **Progressivism**

This philosophy emerged in opposition to the aforementioned philosophies in the context of education. This philosophy is considered a reformer of the contemporary education movement. According to this philosophy, learning materials and skills include problem-solving methods and scientific inquiry. Added to this are educational experiences that foster cooperative behavior and self-learning. All these are important for democratic living. So the course will be interdisciplinary in nature and the teacher will guide the students so that they can solve problems and do scientific projects.

This philosophy has left an imprint on today's education and educational practices.

- **Essentialism**

This philosophy has its roots partly in idealism and partly in realism. This philosophy is mainly expressed as a critical essay on progressive thinking of education. In this philosophy, learning must be thought of as mastery of content, which reflects readily available knowledge across a range of subject matter. The teacher will play a direct role by imparting information to the student. When intellectual skills need to be used, students need to focus on deeper social, psychological issues.

- **Reconstructionism**

This philosophy sees education as the determinant of a restructured society. The philosophers believe that schools are used to practically shape an attitude of all students and help inculcate values in the new generation. As a result, when the students become adults they can surely share their common values and thereby rejuvenate the society.

For the curriculum it expresses a new social, economic and political education. The curriculum prepares several topics for practicing social issues. They practice a progressive attitude planning by envisioning a program of educational reform, a critical education of cultural traditions and the whole of civilization alike, examining controversial outcomes, promising to bring about transformative change in society and society. It is supposed to enhance the reality and cultural innovation of the world we live in and establish transnationalism

2.4. History of Development of Pedagogy Across Curriculum

Pedagogy means teaching; Specifically, the teacher's actions will improve student's learning. Pedagogy means the science or art of child's learning. In modern times, pedagogy in research papers is usually 'teaching' or education.

While explaining the history of pedagogy, it can be noted that various perspectives of pedagogy are explained and various facts and techniques are mentioned. Effective curriculum implementation in the classroom depends on how successfully the teacher is using the art and science of pedagogy correctly. The teacher should act like a parent, understand the needs, abilities and experiences of the children, at the same time know the communication strategies and use the right method to present the learning content.

2.4.1. History of Pedagogy:

Pedagogy means the science and art of teaching children. The word is ancient Greek word Paidagogos. It is a combination of two words “paidos” (child) and “agogos” (to lead), meaning ‘to lead a child’. The word pedagogy (alternative pronunciation, pedagogy) usually refers to instructions based on teacher-student ineractions.

Since ancient times, teachers have tried to find interesting ways to develop different intellectual abilities and to find out interesting ways of learning for students, from students.

The invention of writing around (circa) 3000 B C marked a new trend in education, which was self- reflective; specific knowledge and skills are needed for specialized professions. In the 'Republic and Dialogues', Plato discussed the use of the Socratic method of instruction. In this method teaching is imparted through questions. Through the use of skillful question and answer, Plato’s teacher Socrates proved that even an illiterate slave boy could understand the Pythagorean theorem on his own with proper reasoning.

The Jesuits established their first school in 1548. They believed that high quality learning helps in meaningful living and teaches right leadership and action. They generally aimed at creating teachers and made their own pedagogy based on contemporary learning model.

Ignation pedagogy identifies the five main components of learning: lesson, experience, reflection, activities, assessment, through which the teacher helps the student to recognize life-long consciousness, competence and responsibility. This approach aims to help the teacher to become a better teacher and improves the social aspects of the learning experience by providing feedback to the students.

In the middle of 1650, Comenius wrote the first children’s book ‘The Visible World in Pictures’, where everything is clearly explained with the help of pictures. So he is called the father of modern education. Comenius emphasized the inclusion of a holistic approach in education. He preached that learning begins at the early childhood stage and continues throughout life, and that learning, spirituality, and emotional development are intertwined here.

In 1750, Jean-Jacques Rousseau presented the method of child education in his book ‘Emile’, which describes the story of the education of a young boy. In this book, Rousseau criticizes the importance of environment and personal experience. He discusses different stages of learning-natural learning age (2 to 12 years), social learning age (12-15 years), positive learning age (15-18 years). He was against moral and verbal education. He commented that children’s minds should not be disturbed in any way until the mind is fully developed. Emphasis should be placed on physical and emotional development at the early childhood level. Rousseau’s idea of the self- sufficient person is reinforced by his suggestion of reading the novel by Daniel Defoe’s Robinson Crusoe.

In the late 18th and early 19th centuries, Johann Heinrich Pestalazzi, an educational reformer, influenced the development of educational processes in Europe and America. He proposes a loving friendly family environment for children which would promote technical skills and develop practical, moral and religious qualities. According to him, education would be child-centred and not syllabus-centred. The inner knowledge of the learner is to be revealed. He advocates this type of learning through direct knowledge and advocates self-sufficiency and spontaneity. He was agsinst teacher-centred., curriculum-centered deductive method and introduced child_centricism. He advocated the inductive method, according to which the learner first observes, corrects his own errors, analyzes and interprets the findings of the subject. The learners should get direct experience from Nature so that children can acquire knowledge. So Pestalazzi advocated elementary level reading to include, Geography, Nature science, fine arts and music.

Friedrich Wilhelm August Froebel became a pioneer in the field of child education. He mentioned the development of children's creative abilities with help of games in kindergartens. The word means children's garden where the child will grow and develop normally. Johann Friedrich Herbart was a contemporary of froebel. Based upon his realistic, philosophical and psychological opinions Froebel talked about the succes of his initiate thoughts and ideas. Accoding to Berbart pedagogy is a separate subject in the exercises of curriculion

His Universal pedagogy (1986) states five steps in teaching, which is the base of practical teaching.

(1) Preparation _Reconciliation of old concepts with new learning material. which prepares students for such new lessons.

(2) Proposition_Proposing new information with the help of tangible materials with practical experience. For example, we may cite presenting new information or suggestions

(3) Assimilation-comparing new and old information, finding similarities and differences, and accepting new ideas. For example we may state making connections between new and old information.

(4) Generalization-putting learning into abstract concepts beyond the concrete concepts of observation and experience. For example we may refer to explaining important parts of the text with examples.

(5) Application-acquiring new information and considering it as an intrinsic part of the learner's life. For example, we may mention cheching through test how much new information the students have gathered through the test.

These steps were later considered important steps in the application of pedagogy in America and Germany.

But later John Dewey's New Pedagogy gained importance. There students are freed from a controlled learning environment and receives knowledge and learns independently.

Though new information and theories were discovered, Herbert's institution of pedagogy gained an important place in the field of education. He tried to develop learning process and nature of learners with the help of pedagogy and psychology.

2.5 Constructivist Perspectives and Curriculum Pedagogy Practices

2.5.1 Constructivist Perspectives

Brunner's thought has greatly influenced many modern theories of learning. Constructivist perspectives have been influenced by meaningful learning and discovery learning. Constructivism opposes passive, immutable, fixed knowledge. Constructivism rejects epistemology altogether. Constructivism is usually based on a single conceptual model or perspective.

Constructivists have their own views. According to this doctrine, knowledge is personal and exclusive to each individual

Each person constructs his own knowledge based on the information received from the senses

Differences in knowledge from one person to another are observed. This is why after listening to the speech presented by the teacher from the same classroom the learners give different versions of the same lecture though this difference may not occur in case of role learning.

But if learning is meaningful, the meaning is not the same for everyone.

2.5.2. Need for Constructivism in Pedagogic Practice in Curriculum

(a) The concepts that students form after reading or listening to a subject are different from what they see and hear directly.

Example: When a student is asked to draw a picture of the place after a school field trip, what he expresses is not exactly a photographic description of the place. Rather, it manifests itself in a somewhat altered form. Mental pictures and maps of sensation are not the same. The mental image becomes different being dipped into the corrosive juice of one's experience. As per previous example ...comparing pictures drawn by multiple students shows that no two pictures are alike. Even if two students answer the same question correctly, no two answers are exactly the same.

(b) Hence, according to epistemologists, the organization of a person's knowledge is entirely his own. Teachers should be aware of this. Only then can he help each student to form his own ideas. The student's learning also progresses in a normal way. There is no conflict between learning objectives, reading and student progress.

(c) Emphasis is placed on two subjects, one being adaptation and the other being current experience.

Example: Suppose several people are speaking on the same topic. As the first speaker presented the topic in his own way, the audience formed a sense of his own. If second speaker repeats the same words, the audience loses interest because the first formed concept (i.e. the first knowledge organization formed) does not require any change. There is no new learning. But if the next speaker says the complete opposite of the first speaker, the audience needs to change the idea they first formed. Then, judging the speech of both, the listeners make their own new ideas. This is called adaptation of experience and knowledge. Again, the adaptation action performed between two opposing views is called cognitive conflict. If the teacher creates a conflict of knowledge through reading, only then does the work of forming new ideas become natural. Solving the same mathematical problem in more than one way, giving more than one interpretation of the same event, making a comparative judgment of two opposite opinions, etc., became the battle of opposition to knowledge.

d) Environment should be mentioned. Since the childhood of a person, the physical environment around him (i.e. the objects and forces present around him, the living environment, the social environment, the cultural environment, the various symbols or signs of the environment) naturally influences his mental world, so they also help in the construction of the person's knowledge. Bengali Children are used to eating rice from the very beginning, so when a Bengali feels hungry, rice is the first thing that comes to the mind of a Bengali.

   Example: When talking about fish, the first thing that comes to Bengali mind is rice. In Bengali mindset, the replica of known fish such as Rui, Katla, Bata, Mrigel, Magur, Shilping etc. float. When Bengali says rice, he thinks of rice and various foods produced from it, such as rice, muri, Chira, fried rice, pitha made from rice flour, etc. But people of other provinces understand only rice or paddy.

e) The prepartion of the student is discussed in the last decision. Most theories of learning emphasize the preparation of the learner. Preparation is in every theory. Different psychologists have their own way of establishing their own theories explained the preparation. Constructivists mean something completely different. A learner is said to be ready to learn a new concept when he is ready to incorporate it into the organization of knowledge.

The matter will be easier with the help of example. Let's assume that the student's current idea is learning through repeated practice (Thorndike's formula of practice). He is given three examples or arguments practice of which does not improve learning. Although learning is enhanced by practice in a particular case, it is not always possible for the learner to relate new information or arguments to his or her existing ideas, creating a modified organization. Conversely, another student thinks those arguments and facts are exceptions. Excluding exceptions, the law of practice is infallibly true. There was no new stream of knowledge in his case.

2.5.3 The role of the teacher in the practice of pedagogy in the curriculum

The nature of knowledge is unknown to us. Our own experiences are ours to create, to acquire We express it by oxidizing it in corrosive juice.

Knowledge is completely individualistic, not every person or person's physical structure, experience, environment is the same. Individuals can be said to be cognitively complementary to the extent that, under certain circumstances, their construction of knowledge function similarly. This does not mean that their organization of knowledge is the same. Between two people there may be similarities regarding their feelings and hopes

There may be several similarities based on which they can be compared.

In this example, two friends laugh at each other looking at a situation. about the situation. There is so much similarity between the two regurding knowledge related to the situation that the situation is sure to be fun for both. There is no need for dialogue.

Many cultural customs and norms help us in our social interactions without being pronounced.

Knowledge is organized through the process of adaptation to experience. The organization of knowledge is characterized by cognitive conflict. According to Piaget, cognitive conflict disrupts the

balance of knowledge. In order to maintain balance, the individual reconstructs his or her experience by associating it with new experiences. As no two people's experiences are ever the same, no two people's constitutions of knowledge are ever the same.

Human organization is influenced by the individual's environment and the cues and objects he uses. The role of these signals and objects used in certain social situations is seen in the organization of knowledge Of fellows The meaning of preparation for education is different constructivism. In all forms of learning, however, preparation for learning is very important. In constructivism, its importance is of a different nature.

2.5.4 Conclusion:

In thinking, emphasis is placed on the concepts acquired by the learner. In this theory, the information is presented first and students are usually encouraged to move towards theory formation. In constructivist thinking, the classroom is conducted based on transaction of information, finding sources of information, alternative formats of information, etc.

According to Constructivism students are proactive and inquisitive. They are constantly creating new ideas

In the constructivist school of thought, teachers are in the role of guide. The learning process is rooted in constructivist thinking when evaluation is done by observing, demonstrating, problem solving, etc

2.6 Skills: Development and its Significance

Skill development offers a scientific approach to the teaching learning process. Teacher provides various technical exposures for students' skill development. Developing these skills enables students to find paths to perfection in life.

2.6.1 Nature of skill development (Bhatia) 1977 (Bhatia) talks about many general skills. e.g.- body movement, muscle movement. We learn them to achieve a goal. This skillful maneuver requires the application of a special type of force. For example, while typing, signing or drinking tea, special skill is needed. Just as for physical development, in the physical, so in achieving success. Through practice it becomes a habit. So skill and craft is an integral part of life. Skill development requires coordination of ears, eyes, nose. 2.2. skill development makes the teaching-learning process worthwhile and helps the class to be effective. If should be observed thst learner should not feel tired.

- Proper environment for skill development should be created and should be managed in the right way.
- Reinforcement is a necessary condition in teaching-learning. The joyful, stimulating self that the learner experiences is a positive energizing entity. And the more depressing experience is negative stimuli. Positive reinforcement is excellent for reinforcing student behavior while teaching in the classroom. Proper application of this positive energizing entity helps to develop skills.
- When a teacher throws a question in a classroom, he/she may expect various sorts of reactions from students. Tere may be wrong response, no response, right response. and the question can be repeated as long as the correct process is obtained from the student., so that student incorrect or

incomplete responses are changed to correct responses and so on

- By introducing a variety of stimuli into the classroom, students' attention to lessons increases.

2.6.2 Significance of Development of Skills for Learning:

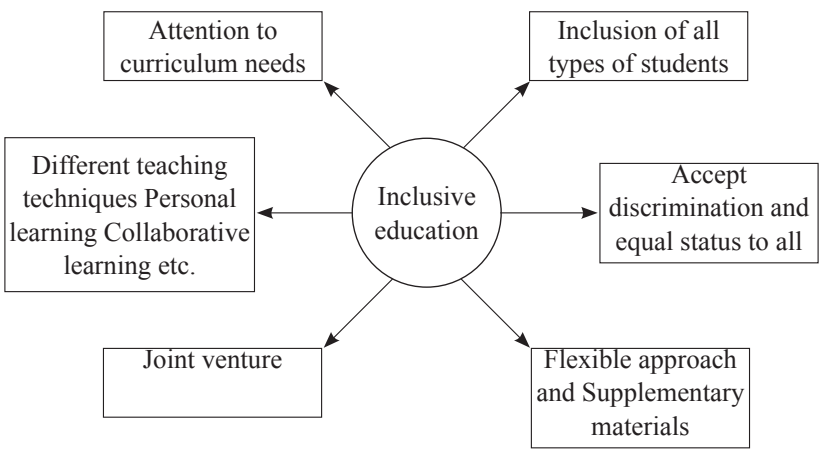
Skill refers to performing some task perfectly. If students do not acquire skills, they will not be able to do anything. Skills usually follow some steps. For example - demonstration— teacher demonstrates. Test-learner's own effort, feedback-learner's own learning results in knowledge and practice, which is performed by the learner. By following this step, as the student's skills increase, visualization also develops. Because skill teaches a person to perceive things. Besides, students can improve their abilities and can easily finish any work in less time. Skill development increases ability of the student's muscle contraction, reflex movement and perceptual ability. Besides, it is also possible to explain any function with a clean and beautiful visual experience and emotional experience

2.7. Pedagogy Across Curriculum for Inclusive Education

2.7.1. Inclusive education

Swami Vivekananda's quote on 'Is education a human right' needs to be presented. Education is the full development of human potential. (Education is the manifestation of the perfection already in man) All-round development of the student is not possible without education. It is imperative that the state provides education for every student and human rights should include education. India's Right to Education Act (RTE Act) reflects this right. The United Nations, in the Universal Declaration of Human Rights (1948), recognized education as a fundamental human right and education for all. (EFA) is considered as a global strategy. UNESCO Salamanca Statement (1994) declared Inclusive Education internationally.

Inclusive learning is a type of learning where all children are accepted. Students now attend school together, no segregation. In this system, various aspects of education need to be expanded or reformed. such as teaching methods, curriculum, facilities etc. In this system, care should be taken to ensure that the student can take his/her age-appropriate education.



[Shukla, N. (2001) Inclusive Education (NCERT)]

2.7.2 Steps to Implement Inclusion through Pedagogic Practices in the curriculum.

UNESCO has prioritized several principles of inclusive education -

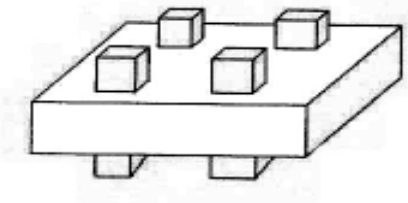
- Education is a progressive and ongoing process to combat discrimination It teaches us to live along with discrimination and to have lessons from discrimination.
- Where and how much educational participation students have since attending, how much experience they gain and poficiency refers to how well they are doing according to the curriculum.
- The purpose of education is to identify, control and include students who are marginalized, excluded, under-achievers.
- But some steps need to be taken to implement this inclusion through the curriculum, which are-
- Giving importance to all students and staff of the school.
- Arrangements for to facilitate them students to participate more in co-curricular and curricular activities in schools
- School policies, practices, facilities etc. will be revised keeping in mind the discrimination of local students.
- Barriers to learning should be minimized keeping in mind special educational needs, so that all students get the benefits and participate in learning.
- Barriers to learning must be overcome so that, specific learners have access to opportunities to participate and all Students also benefit. difference among students should be considered as resources to support learning rather than as barriers to learning.
- Acknowledgment of student's right to education in adjacent or neighboring schools.
- Emphasis should be placed on values in addition to academic excellence.
- Reciprocity between school and society should be increased.
- Inclusion in education means the concept of inclusion in society— should be properly understood.

(Ref: Booth & Ainscow-2002)

Inclusive schools have been set up in various places in India like Goa, Delhi. There diabled children and gifted children, street children and working children, children from various minority communities, children from remote and nomadic and marginalized areas or groups are brought together, under the same roof, in the same curriculum. only the school environment and curriculum are transformed.

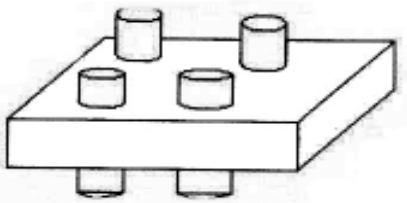
Diagram 1

Special Education



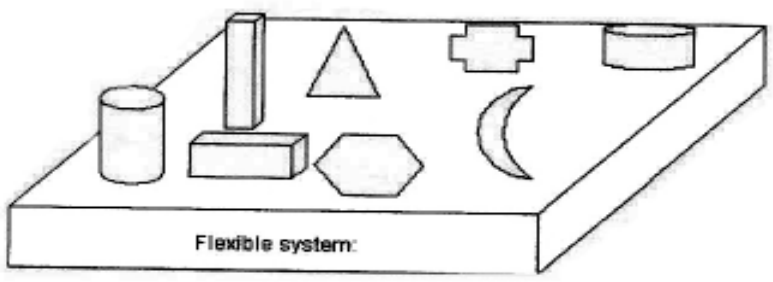
(1) Children with special abilities.
(2) specialised education according to the problem.
(3) Specially trained teachers.
(4) to import Specialised education schools

General Education



(1) General children.
(2) General Child and Education System.
(3) General teachers.
(4) General schools.

Inclusive Education



(1) Children with different abilities and needs
(2) Every child can achieve unique education.
(3) children with different, age, ethnic group, sex
(4) The educational system should be changing.

2.7.3. Steps to make immersive learning effective:

Department of Education and Science (2007) speaks about making inclusive learning effective, different teaching strategies and approaches are to be applied formaking it effective. It is very important to clearly explain the objectives to the students, because in this type of learning process, the learning process should be variable, the content selection should be adapted to the needs and abilities of the students, and a multi-sensory approach should be applied. Over sometimes students are to be regularly assessed through constructivist mode. Educational materials should be according to the needs, age, eagerness, aptitude. Reinforcement is to be arranged so that students can practically apply their

knowledge and skills. Linguistic, personal and social communications ought to be increased through curriculum. Each child is to be perioded with proper environment for working/functioning freely.

- Everyone is included. No one is excluded in clusive education
- Children may assemble together to attain education in inclusive education.

2.8. Summery

It is impossible to begin work on curriculum development without addressing the context of the transition to curriculum practice. Philosophical and historical approaches in the context of pedagogy related to the practice of curriculum are important. Alike it constructivist approach, development of skills and inclusive education are important. Each step complements each other because historical and philosophical aproaches establish basis, just as other perspectives have helped shape modern curricular practices. In today's classrooms where children with mixed abilities receive instruction, attention must be paid to creating inclusive and holistic development of each child's creative abilities.

2.9. Unit End Exercise

1. Write the answers to the following questions:

(1) Discuss the philosophical or historical basis of curriculum practice pedagogy.

(2) What are the implications of constructivist approach to pedagogy in curriculum practice? Explain with examples or case studies in this case. The role of the teacher should be mentioned.

(3) What is the need for inclusive education in curriculum practice? How do you think it can be implemented in practice? Explain with examples

(4) State the principles and significance of skill development. What is the difficulty in implementing the curriculum if the right skills are not developed?

11. Write answers to the following questions:

(1) Explain the main philosophical foundations of curriculum design.

(2) Explain the five steps of pedagogy according to Herbert's followers.

(3) How to apply constructivism in the curriculum.?

(4) What is the teacher's role in implementing constructivism in the classroom?

(5) Explain the steps to implement inclusive education.

III. Write short answers to the following questions

(1) What is perennialism?

(2) What pedagogy is Herbart's pedagogy?

(3) What is the constructivist perspective?

(4) What is skill?

(5) What is the role of empowerment as a principle of skill development?

(6) Why is inclusive education more important or necessary than general or special education?

(7) What do you mean by inclusive education?

Topics to know:

(a) Pedagogy and philosophy of education.

(b) Constructivism

UNIT 3

Integrated learning into curriculum practice

3.1. Introduction

Integrated learning brings the previously isolated subjects together to the learner's mastery.. Integrated curriculum refers to the delivery of teaching-learning content in an integrated manner. This combines a variety of content types.

3.2. Objectives

At the end of this chapter, trainee-teachers will be able to master the following:

- Be able to understand and explain the concept of integrated teaching-learning.
- Able to explain interdisciplinary and multidisciplinary concepts.
- Can explain the difference between these two concepts with examples.
- Can apply interdisciplinary concepts correctly.
- Can apply classroom situation, social, cultural aspects.

3.3. Concept of Integrated Teaching-Learning

Integrated teaching-learning presents the series of subjects together in front of the students so that they can understand the subject properly. Here the student gets training to connect The curriculum. He/she creates new knowledge by establishing a healthy relationship between skills and knowledge from its sources.

Integrated teaching-learning evaluates the learner thoroughly to present information in a refined manner in which the learner acquires objectively relevant learning. Students have the opportunity to develop knowledge by making connections between parts of different areas of the curriculum. Through integrated learning, students get opportunities to learn new things every moment. Integrated teaching and learning is often referred to as the inquiry approach. In this teaching-learning process, the student plays an active role, where he helps himself and others to learn through the process of research, inquiry, interpretation. Here, the student uses previous knowledge. He/she new meaningful knowledge through connection.

3.3.1. Examples of Integrated Learning:

"If I Were an Arab Bedouin"

It is read by students in literature class, from there they become inquisitive about the location and history of Arab country. They also want to know about the food and dress of its people. Students are getting knowledge about the history, geography, social conditions of a particular place along with literature reading. This is an example of blended learning.

Another example of integrated teaching-learning is Gandhi's basic education. In this case, he integrated agriculture with spinning wheel.

3.3.2. Benefits of Integrated Teaching-Learnining

The ways in which integrated teaching-learning has benefited the student are:

a) Develop cooperative attitude among students so that they perform team work effectively

b) Effective and productive integrated teaching-learning helps to create experiential learning situations.

c) Learners have the opportunity to construct new knowledge based on previous knowledge.

d) Integrated teaching-learning is child-centered, so students have the opportunity to exchange experiences from many cultures

e) Students can judge how much knowledge they have gained by demonstrating their skills, in oral or written tests.

3.4. Concept of Interdisciplinary Approach—Difference with Multidisciplinary Apporach

3.4.1. Interdisciplinary-learning

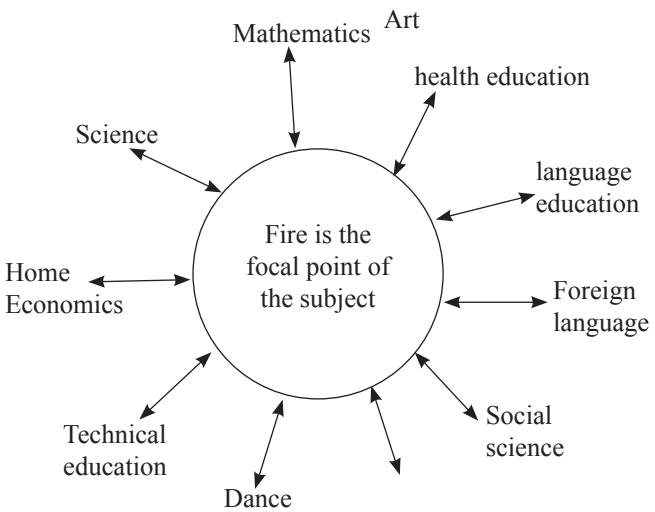
Interdisciplinary teaching-learning mainly uses integrative methods where multiple learning content structures are analysed. Different elements are synthesized, for and then specific ideas and information are made. This type of teaching-learning approach builds insightful understanding of complex issues after gathering information from various subjects. Learners learn from different perspectives by forming new concepts. In this type of genesis, the student connects any topic from multiple perspectives with the help of judgmental analysis and interprets it in an integrated and abstract framework.

3.4.2. Multidisciplinary teaching-learning

In this approach to teaching and learning, any subject is interpreted from multiple perspectives. But no series is adopted. Different subject perspectives are linked or combined.

3.4.3. Identifying differences with case studies

A group of teachers try to identify different subject areas to be included in the learning activities while determining school curriculum and also analyze what student is good at in any subject. It turned out that everyone, found the main subject (fire) with the other subjects except Maths. At the next level, Math expert can easily relate fire with Maths. This means how to place learning in different subjects within a framework. This is the multi-disciplinary approach.

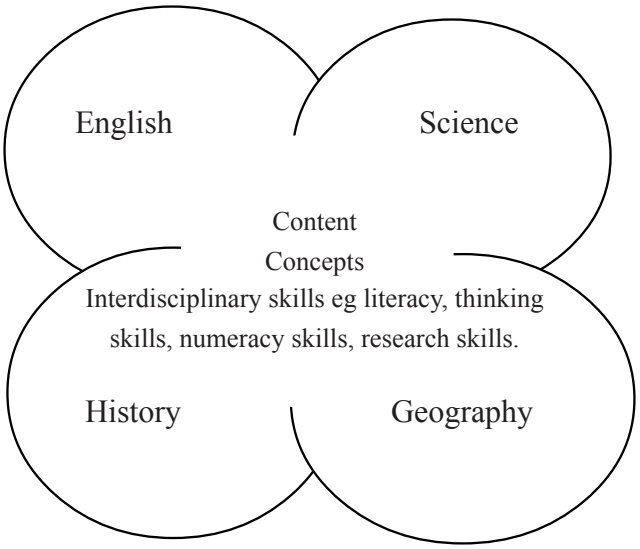


Multidisciplinary perspective

Explanation: In the classroom the teacher uttered a word in front of the students, that is 'fire'. Then asked the students to find the relationship of the word fire with different subjects.

- **Health education :** students explained the consequences of fire or smoke.
- **Science student:** explained how fire occurs, what chemical reactions occur as a result of fire.
- **Students of Arts Department:** They explained the incident of fire at Amri Hospital through a puppet show.
- Social science students explained devastating fire in Amri Hospital and its consequences on society.
- Foreign language learner explained how to explain fire in a different language.
- Dance students interpreted fire through dance.
- Mathematics students explained the extent of fire-affected areas with the help of scale and mapping.
- **Technical Education:** explained what precautions should be taken in fire protection.

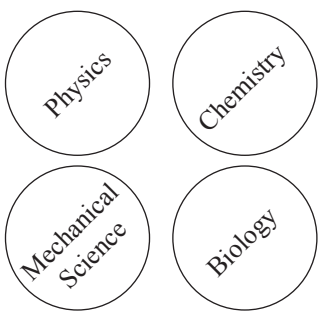
Interdisciplinary perspective



The teachers noticed that the differences among different subjects were very little. The main reason for this is that the subjects are thoroughly researched to see how each subject is related to each other.

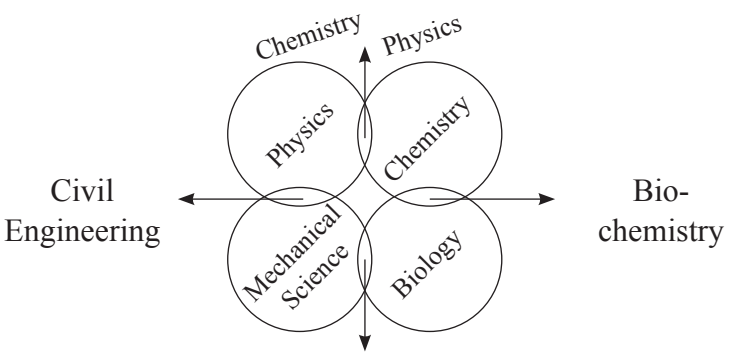
The teacher asked the students to explain different aspects of the subject with some content concepts, such as numeracy, literacy, thinking, research skills. It was seen that the students explained various subjects like English, Science, Geography, History concepts in relation to each other.

Multidisciplinary perspective



Each individual subject is different

Interdisciplinary



Individual topics range from one subject to another

3.5. Significance of Interdisciplinary Approach in Integrated Teaching at the Elementary Level

- Explain interdisciplinary approach with examples.
- Distinguish between multidisciplinary and interdisciplinary approaches with examples.

3.5.1. Importance of Integrated approach in Integrated Learning at Elementary Level:

By engaging students in classroom activities, developing their knowledge, insight, problem- solving skills, confidence, self-efficacy and willingness to learn is an important duty of teaching facilitators. And the development of these traits is possible only through the application of an integrated approach in an integrated learning environment.

1. **Concepts:** How the concept of 'what happened' and 'whose it' is acquired; Explain it clearly.

   Example: The teacher draws a fruit on the blackboard and asks the students a question.

   - Identify the fruit
   - What is done with the fruit?

2. Integrated approach helps students to develop cognitive abilities, intellectual skills and mental processes. Students learn to form multiple opinions on specific issues. As a result they learn to understand the problem and can give correct interpretation.

   Example: Students are asked to explain the various properties of the fruit and how it is used.

3. Integrated approach teaches students to find reasons for uncertain concepts. Disagreement happens but there is also listening, trying to understand and prioritize each other's opinions.

   Example: Students are asked to talk about different ways of using and applying fruits (eg what can be made of, what is the taste, what is the form, etc.).

   This is where there is a difference of opinion.

4. Integrated perspective helps in developing intuitive learning or skills in specific subjects.

   Example : Form an idea by combining the different types and uses of the fruit.

3.6. Socio-Cultural Aspects in Pedagogy Across Curriculum

Socio-cultural factors are incorporated in curriculum design. If there is a discrepancy between curriculum content and Socio-cultural aspects then educational instruction fails to achieve success. curriculum instruction depends on some socio-cultural elements. These are—

- National, regional and institutional policies and educational philosophies
- Traditions and virtues of education are the key to success in real life after education
- Proper use of instructional materials
- Characteristics of students

3.6.1. Case Study

Photo of Rabindranath	Aeroplane
shark	Bird's nest
Washing machine	Computer
Doel bird	Paddy Gola/Marai
	Zebra Crossing
Satyajit Ray's name	AC machine.
Dish Washer	River dam
Boat	Tile thack
Straw thatch	Prawn
Octopus	van rickshaw

The teacher mentioned some names in front of the students and wrote them on the blackboard. He then asked the students who knew what about the subjects. It Turned out that some have never heard of anything. The name of Satyajit Ray is well known to some. Some have never heard of it. People living in urban areas know nothing about van rickshaws or straw thatch, but rural students are well acquainted with both. The socio-cultural position of students is known from this. And this effect is observed throughout the course.

3.7. Summary

The basic concept of integrated teaching is to try to bring separate subjects together in the student's mind. That combines interdisciplinary and multidisciplinary, so that students learn to distinguish between the two. It is taught how to apply it practically in the classrooms. The real relevance of Integrated learning is how students perform at different levels through gaining insightful knowledge, and with this determining what socio-cultural factors are influencing the curriculum.

3.8. Unit End Exercise

Section A (500 words)

1. What is the concept of integrated teaching-learning. Explain with examples how to implement integrated teaching-learning in classroom.
2. What is interdisciplinary approach? What is the difference with multidisciplinary vision? Explain with examples.
3. Is there any place for interdisciplinary approach in integrated teaching-learning? Explain with logic.
4. Discuss in detail the socio-cultural elements of the lesson.

Section B (250 Words)

1. Illustrate the concept of integrated teaching-learning with examples.
2. How would you apply the interdisciplinary perspective to the curriculum.
3. Explain interdisciplinary perspective with examples.
4. Which of the interdisciplinary perspectives do you think is more acceptable?

Section C (25 Words)

1. How would you apply implement multidisciplinary approach in the classroom?
2. In what situations would you apply interdisciplinary approach in the classroom?
3. Write the socio-cultural elements.

UNIT

4

Knowledge and Research methods

4.1. Introduction

Message obtained from sensory organs is not just knowledge. This knowledge acquisition or knowledge construction process is the main practice of modern education. In the modern world due to the explosion of information and the influence of technology, gathering information is not a particular problem for students. Constructing knowledge using various techniques based on the given data is the main subject of pedagogy and teaching methodology. Exploratory techniques have been in use since ancient times. The nature, characteristics of inquiry strategy, its impact on school curriculum etc. have been discussed in this unit. Project method has occupied a prominent place in the modern teaching-learning system. However, there is a focus on whether any method is fully acceptable, and how acceptable it is.

4.2. Objectives

Skills that the learner can achieve by the end of this lesson unit are

(a) Distinguish between data and people

(b) Conceptualization of knowledge acquisition based on school curriculum

(c) Conceptualization of how knowledge can be acquired through information search techniques

(d) Different Thematic Thinking Techniques-Scientific, Mathematical, Social and Advanced Thinking Techniques

(e) Making connections among knowledge, curriculum, textbooks, learners and pedagogy

(f) To master the nature and application of inquiry based learning process

(g) To master the process of making any lesson perspective dependent

(h) Acquisition of concepts and skills on how to conduct project based learning

4.3. Concept of Knowledge, Information and thir differences

4.3.1 Knowledge and Information:

Active participation: The teacher comes to the board and writes a few words-eg Rabindranath Tagore, poetry, rainy season, 6 feet 2 inches tall, shantiniketan, Jorasanko etc.

Students are then asked to think about these words. Many are able to say something about Rabindranath Tagore or can say more.

Now the teacher will explain words are called information separately. Again, this information are based on some organized ideas in the mind of the common man, it is called knowledge. The matter can be seen in another way—

Knowledge can be gained based on information and this knowledge is expressed in two ways. Declarative and procedural. The knowledge acquired by creating a mental representation based on information is called Declarative. Being able to solve problems by applying replicas representations is Procedural knowledge

Example : How is tea made?

- Being able to tell the method--descriptive knowledge delarative knowledge.
- Being able to make tea-procedural knowledge

Such examples can be given by trainees.

Knowledge and Information – difference

(a) Information are some distinct words.

Knowledge establishes relationships among words

(b) It is not possible to solve the problem with information alone

Ability to solve problems through acquisition of knowledge is significant

(d) Assimilation of imformation does not require higher thinking.

Information is transformed into knowledge with the help of higher thought processes.

(f) Information is objective and knowledge is subjective

Knowledge is individualistic : Information is the source of knowledge as mentioned earlier. In the modern education process the student has to be provided with the range of acquiring knowledge to realize the objectives of making the student active, inculcating into him /her critical thinking etc. Teachers can assist in creating this range by organizing various information.

4.4 Concept of Knowledge Construction—Case Examples from Elementary School Subjects

In order to directly introduce the concept of knowledge construction, it must be analyzed through the conventional curriculum.

4.4.1. (a) Language Education:

Introduction to English language and knowledge of English letters and alphabets in the elementary grades-a classroom activity designed for this purpose is given below to explain the knowledge building process of the students.

A case study

Nanda is a teacher teaching in class II. She teaches in a primary school in a town in North Twenty-four Parganas. While teaching, she sees that many in the classroom can not make the connection between letters and sounds. Teacher selects a particular text-unit. She tries to make connection between letters and sounds by selecting words. For all the students active in the classroom she makes some flash cards with words on one side and pictures on the other and started practising with the students.

First the picture is repeatedly shown and the word M for Mango is said repeatedly and the students repeat. M for Mango. The letter is added to the word with emphasis on the first word. Then through various questions to get more familiar with the word.

For example - Do you like mango? Then hold the letter cards and teach to pronounce them. For the next week, the students would be divided into small groups and play a game of matching letter and word cards

Learners learn to make connections between sounds and words they are encouraged to pronounce more new words. By listing real words, using those words in their sentences increase their ability of connections between words as well as gaining knowledge about how words are used. A few questions need to be answered from this event

(a) Do you find the way effective in which students are taught in the above description?

(b) What other method can be applied besides this?

(c) When a student can read the words on the cards but cannot identify the same words in the textbook, what he is supposed to be the problem?

Learning Mathematics

A class activity aimed is described which is aimed at developing the concepts of range and area in the elementary grades. Through this the method of building students' mathematical knowledge can be described.

Some of the problems that students may face in learning area and range can be mentioned based on the research of Watson (2013).

(a) They sometimes find perimeter are as just formula without understanding what area and perimeter actually are

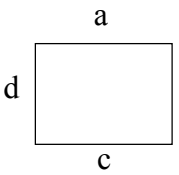
(b) They confuse the concepts of area and perimeter.

(c) It is difficult for them to develop concept of magnitude. Perimeter is a length and one dimensional and area is two dimensional—this concept is confusing to them

(d) They may not interconnect their everyday experiences and their knowledge regarding area and perimeter gained from maths classes.

Keeping these points in mind, emphasis should be placed on the subject so that the overall knowledge of the student is constructed. Here is the topic. Students should develop the concept of range by working in pairs.

Activity- 1 classroom training should be practiced with all students to facilitate them to learn the subject. First they are instructed to mark the perimeters of the objects around them. Mathematical definition of perimeter should be discussed with them. It is the measurement of the length around a two dimentional shape



range = a + b + c + d

Part I: Each pair should identify at least three two-dimensional objects in the classroom and determine the perimeter of each. will be specified. Just observe how they are doing the job.

Second Part: At the end of the time all the students' opinion should be known. Every result will be different because different people will determine different objeects and their perimeters. Now it should be known from them about the sizes and method of determining the perimeters of objects that the students have identified.

These are to be written on the black-board. In practical environment the concept of perimeter is applied as a concept related to familiar objects. The stages of knowledge construction, followed here, are:

(a) An implied and abstract idea of perimeter as example

(b) Familiarity with the properties of perimeter— it is two dimensional length, expressed in units of length.

(c) The time when students actively identify two dimensional objects in the classroom.

(d) Can determine that perimeters of those objects. Their acquisition of abstract knowledge is accomplished by pursuing tangible objects.

Similarly the concept of area should also be constructed with the help of student's activity.

4.4.2. Science Education

Through science education, students' willingness to question or curiosity can be expressed. With the help of this, they can make accurate judgments about the world around them. One of the teacher's tasks is to encourage students to ask questions and make them inquisitive. A case study for this is given below.

- **Case Study :** Mrs. Sulekha Ghosh is a class IV science teacher in her school in a small town. She wants the students to identify the different types of animals and plants around him. She wants to create criteria for this identification.

Some pictures are cut out from various newspapers and magazines and hung on the wall. Among them are pictures of tigers, elephants, cows, monkeys and horses.

After a while she asks the students to come forward and ask various questions and she writes them on the board. The questions are mainly about the characteristics of those animals. These characteristics can classify animals. for example we may cite - the size of animals skin color, various designs on the skin etc. And the similarities are also written on the board. Then the discussion proceeds Animals can be classified based on certain characteristics.

Thus the classification of animals is based on general characteristics-their food, habitat, etc. Students can understand the information through questions and discussion. Similarly the process of classification and identification of different birds and plants is possible. And once the students find the connection of science lessons with everyday familiar life, they will start exploring new questions.

A number of issues arise from this-

(a) what questions to answer and what to use to lead the student to inquiry; to be interpreted with the help of professional judgment of the teacher.

(b) Every question may not be very relevant but students should be given adequate time to explore the subject in depth.

4.5 Methods, of Enquiry, Different Types of Thinking—Scientific, Mathematical, Social, Higher Order Thinking

Scientific, mathematical, social, and advanced thinking processes Investigative methods are the organization of new information or ideas through detailed inquiry based on known information. From time to time the new theory has to be accepted through repeated tests and observations. The inquiry strategy can be conducted in schools focusing on different topics.

4.5.1. Scientific Inquiry Scientific inquiry began more than a thousand years ago. At that time, there was a special method of scientific method of esteem which has been changed and evolved with the evolution of time. The stages are-

(a) Data (Hypothesis)

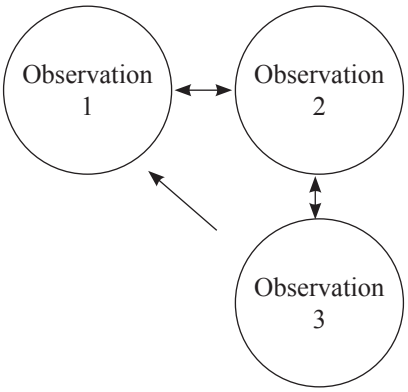
(b) Hypothesis or prediction of what may happen later or by extraction from data.

(c) Conducting tests and verifying the above based on this prediction.

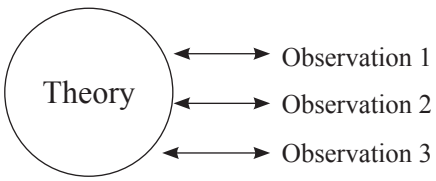
These stages are not absolutely specific in all cases. It is not always the same. But it is with the help of these stages that scientific inquiry takes place. Scientific inquiry is usually conducted with an experimental or observable focus. Thus perceptible knowledge becomes concretised. Sometimes previously acquired knowledge is organised through new experimentation / application, E.g. Newton's law of motion was expressed concretely by Newton but before that the formulas isolatedly, existed.

When a number of independent, isolated observations are reported together, it is called a theory. Theory consists of explanatory formulas. The matter can be illustrated.

Scientific research



Again, if you want to search based on a theory, the matter will be as follows



The process of scientific inquiry can be carried out in two ways.

These observations, definitions, measurements of objects etc. are taught through the educational process. Apart from this, the determination of the next process through examination, judgment, etc. also takes place in it.

In order to carry out this type of search, a person needs to have certain characteristics, for example - intelligence, imagination and creativity

In an educational environment the entire process can be divided into several tasks. For example -

(1) Defining a subject/characteristic

(2) Observation and data collection in accordance with that definition.

(3) An explanatory project or hypothesis preparation

(4) Verification of the project through testing and therefore collecting information

(5) Analyzing the collected data

(6) Interpreting the results related to the data after the analysis

(7) A new project may arise from this explanation

(8) Publication of results

(8) The same examination should be repeated by someone else

Although these stages are not necessarily applicable to all scientific practices in a clear order, each stage is somehow practised.

Activity: Science subjects can be taught in the school classroom with the help of short scientific investigations. A very common test for example is the acid and alkali test using red and blue litmus

paper. Divide the students into small groups to explain the properties of acids and alkali and prove those properties with the help of experiments.

4.5.2. Mathematical Inquiry

Scientific and mathematical inquiries are mutually stimulating. Research (1975) based on problem solving expresses that mathematical evidence based methods are different from scientific methods.

Mathematical method	Scientific method
1. Understanding	Characterization through experience and observation
2. Analysis	One possible interpretation of the data think about the particular situation
3. Synthesis	And analyze the theory behind it

Polland states understanding is expressing unfamiliar definitions in one's own language. According to Imer (1976), mathematicians actually develop their own work through contrasts, critiques, and revisions.

Active Participation: These methods can be used in regular mathematics education in the classroom environment. Students in the classroom are given a sum:

If x = 1·0, what is the value of $5x^3 - 3x^2 + 7$? There are problems regarding cube and square in this equation. The student is then asked to find the cube of 3. and 0·1. They found that even though the cube of 3 is greater than 3, Cube of 0.1 is less than 1. Then they solve the given problem. That is, the whole problem is solved in the process of synthesis when the students in the classroom develop an understanding of the arrangement of numbers. Then their retention will expand by solving many such problems.

4.5.3. Sociological Inquiry

Inquiry-based learning is prominent in John Dewey's pedagogy, but Geoffrey Kaplan considers its main practical importance. This approach follows participatory democratic principles while teaching sociology.

How exactly does practice-based learning look at sociology?

Levstik (Levstik 2001) identified student's search in different forms as main objective of sociology. It is mainly developed based on society and individual characteristics, preferences, values etc. This inquiry is of the same nature for teachers of all classes. That is why selecting different questions is the main task of educational research. These inquiries continue depending upon various questions in different classes. Somethings more than information are expected from sutdents' asnwering.

Whereas to some extent his judgmental thinking can work. The point can be explained with an example-

(a) Primitive man lived in caves. - **Information**

Q: Why did they live in the cave?

Ans: The answer was that they could not build house.

Q: How could he stay in the cave.?/ How could he enter the cave?

Ans: Because then people used to walk on four legs. This information is related not only to history but also to biology. Interdisciplinary learning through questioning is here.

An important aspect of the application of the term inquiry in social studies is the framing of content suitable for practicing judiciousness. Tower (2000) states that reading non-fiction books is the main means of practicing judgment in primary education.

Chard (2004) states that inquiry strategies can be advanced based on students' general prior knowledge. Also some environmental conditions are particularly applicable here. As a whole a curious and enthralled environment for free discussion is needed in the classroom. That knowledge is applicable to other areas of life if the thought process is properly designed. The model of sociology teaching that applies to judicious thinking is the Jurisprudential Model. This model directs students' inquiry into particular social characteristics and problems.

Its many phases have been variously identified.

(a) Orientation—Making students aware of consumerism

(b) Hypothesis—determining a hypothesis on the basis of a subject. For example, the relationship between socio-economic status and product-enchantment.

(c) Definition—Explanation of various concepts and issues related to data. What exactly is commoditization? How does it spread?

(d) Exploration—logical judgment, determining the correctness of the subject, how people become interested in the objects.

(e) Evidencing—Collection of data related to attraction to things according to socio-economic position of people.

(f) Generalization—solutions and decisions based on collected data, from different socio- economic positions. Making decisions about how to adopt a materialistic perspective.

The six stages mentioned in Hilda Taber's model are-

(a) Orientation to the subject

(b) Identification of the issue

(c) Taking a position

(d) Exploring the stance underlying the position taken

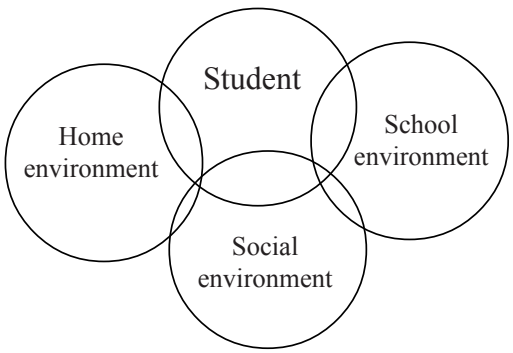
(e) Refining the stance

(f) Testing assumptions about facts and consequences. Through this method, social issues are discussed, analyzed and criticized. Students will not only know information and memorise thse but also they would practise judicious thinking through specific inquiries. Their opinions regarding society and culture would be formed.

4.6 Relation Between Knowledge, Curriculum, Text Books, Learners and Pedagogy

4.6.1. Perspectival dependence

Taylar and Mulhall (2001) identified three learning environments for school students namely-social environment, home environment and school environment. The inclusive education movement that has begun in modern education policy will never succeed unless the learning experiences of the students are linked to their environment, Connecting learning experience with the children's environment is perspectival dependence in learning.

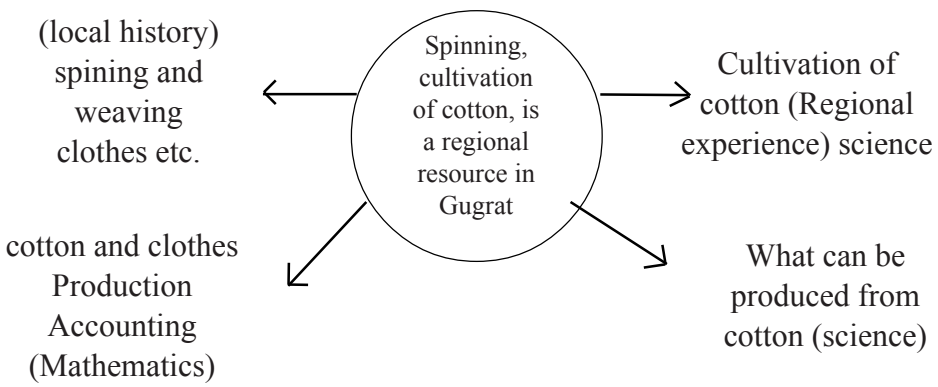


Meaningful learning is possible only when the different environments and experiences of the students are integrated in this way.

Now the question is, how to integrate?

In terms of learning, dependence is only possible when the supporting material related to the contents and methods would be linked with students' environment.

The theme of self-reliance was to a large extent connected with this aspect of the Buniadi shiksha Education scheme that Gandhiji had planned in our country.



(a) One of the characteristics of this learning method is that it can link different subjects together.

(b) May combine formal and non-formal education.

(c) Can develop some skills.

(d) Education can be made more vocational by exploiting the various natural resources of a

region. Abroad, there are such projects in countries like Thailand in South Asia. Many such manifestations are emerging in the field of agriculture and with emphasis on agricultural resources. There are many such opportunities in our country. As ours ist an agricultural country, the regional curriculum and methods centered on agriculture will enable students to acquire life-oriented education.

4.6.2. Project Methodology

A significant teaching technique in the student-centered education movement is the project method. Kilpatrick, who is recognized for introducing presect method as a particular method of problem solving, proposed this learning method in the early 20th century. Student will try to discuss a problem and would try to arrive at a solution based on reviewing a problem, the aspects that are practiced through

(a) proactivity,

(b) goal dependence,

(c) practice of alternative thinking in problem solving,

(d) gratification through solution and gain motivation of active proactivity.

How is this method useful in modern education?

Project Method	**Project Method**
(a) we learn more when curious or interested in purpose.	We must know our purpose and be active
(b) Learning by application is better	The project is determined by demand
(c) New knowledge is most useful if applied	Problems in projects and it's complications are gradually increased
(d) Successful learning facilitates further learning	Always the benefit comes from practice and application

According to Kilpatrick - (Kilpatrik, 1918) the distinguishing features of the project method are dependence on objectives and to maintian balance with social environment. The social context is particularly important here. This method can be used in a variety of teaching environments.

(a) Constructive—self-constructed chart about some element or feature of social life —charts, Models, Maps etc. Time - concept chart in history, model in biology or map in geography etc.

(b) Art—based — application of music, drawing, visual arts, drama etc. These can be applied in various subjects in everyday classroom teaching.

(c) Problem Solving—Development of some skills necessary in life, for example-(Email account) how to be opened

(d) Group work—divide students into small groups to make a garden in a school or keep books properly in a library etc. The characteristics that result from this project based learning in the students are-

(a) Spontaneity, (b) Goal orientation, (c) Significance, (d) Interest, (e) Motivation.

Advantages of Project Method:

(1) Through the project method the learner is active in a purposeful manner

(2) Gaining experience is beneficial as learning is done by doing.

(3) Can discover a specific way to solve the problem.

(4) Gains social experience.

(5) Subjects learned in the project method provide a relatively life-centered experience resulting in transfer of learning in different situations.

Disadvantages of the Project Method

(1) Project method is not applicable in all subjects. This applies to some subjects and not to be applied in all teaching methods.

(2) Special skills are required to manage the project process properly.

(3) Sometimes the student's time and effort are wasted for applying the project method.

To make the project successful, the project should not be considered as an independent teaching method but should be applied in conjunction with other methods. A leader should be selected to lead each small group. The project should be timed according to the importance of the subject.

▸ Case study 1:

Chitrita Roy is a city school teacher. She took up a project on local people's lifestyle, food habit, dress for regional geography while teaching geography. As the students did not get any specific outline of the project, all of them submitted the project by filling in the notebook with some pictures. The project is evaluated based on the image.

▸ Case Study 2 :

Rahul Mondal is another school teacher. He also teaches g1eography and gives the same project to students to learn to think about it. There, students' thinking is valued more than pictures for example, why people of this region are more engaged into a particular livelihood. What are the characteristics of their food habits and why? What identities of economic shandard are derived from their way of life. From the above two cases some points about the application of project method can be discussed in the classromm:

(a) In which of the above two cases is application of project method correct?

(b) why is it considered correct?

4.7 Basic Tenets of Enquiry Based Learning, Contexyualization, Project Based Learning

In this part of the lesson unit we have to determine the relationship among the various elements associated with the overall learning process. We can clarify the matter through a few questions.

Who will learn?—Students

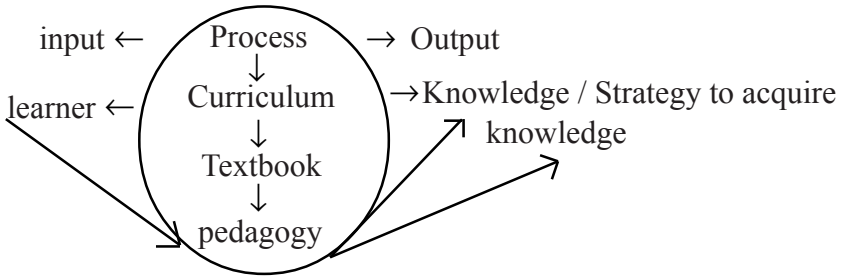
Why will he/she learn?—To acquire knowledge

What will he/she learn?—subjects in curriculum

How to learn?—through pedagogy

How to reconcile the two questions of what to teach and how to teach.—should be taught through text book.

Let's look at it this way if we want to explain the matter with the help of educational perspective.



The matter may be explained thus--

A learner is a member of society and environment who acquires new ideas through active participation in his senses, perception, etc. That concept and skills help in solving various problems in real life situations.

4.7.1. Curriculum

The word curriculum is derived from the Latin word horse meaning the specific route of riding. Pathways are specific ways to move towards specific learning goals. While determining the subject and nature of the curriculum, a few questions usually arise such as-

(a) Which important or relevant subjects are to be tought to the students?

(b) Consider the importance of any subject that students are seeking.

(c) In what manner will the subjects be presented or what will be the pedagogy?

All these questions involve how we view curriculum. Generally all courses try to combine all experiences.

However, with the passage of time, the perception of society, education and the role of students have changed. Currently in student-centered approach students are encouraged to play an active role in the classroom. The key here is reciprocity. Teaching Process is important here as any subject consists of own characteristics. According to this ideology Curriculum is a process. The characteristics of this concept are

(a) Curriculum is a specific set of teaching practices

(b) Guides any testable learning concept with appropriate hypotheses and activities.

(c) Decisions are arrived at by conducting proceedings.

(b) Formulate teaching plans according to the characteristics of each class.

(e) One of the tasks of the teacher is to consider the effectiveness of the plan through its implementation.

(f) Outcome of course application is not given utmost importance here.

(g) The nature of content and the nature of expertise are determined through teacher-student interaction rather than pre-determining behavioural objectives;

This ideology of curriculum faces several problems. It does not apply to generalization of content or to the teaching of any values specific to the country or region as a whole.

The example of a higher or better concept is curriculum is praxis.

(a) Emphasizing the reader's sense of meaning and judicious approach.

(b) There is no comment on objective of curriculum.

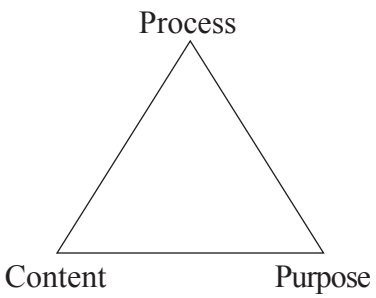
(c) Action as a whole enriches both teacher and student.

(d) Both teacher and student approach the problem and try to arrive at its solution

(e) It combines both unconventional and conventional processes as a thary of curriculm..

In theory this is laudable. But in reality, solving problems and interations are not practicable without proper infrastructures of schools as well as proper contents. So our National Curriculum framework has discussed the new context-based exchange strategy while maintaining subject-based anned curriculum.

Here is the curriculum learning plan that will be served through a activity-based integrated pedagogy. That is, we are practically approaching curriculum implementation as process oriented. Content, objective everything will depend on the process.



4.7.2. Pedagogy : In the traditional language pedagogy is the art and science of teaching, the understanding of a subject or concept, and the application of that understanding for solving various problems. The Association for Supervision and Curriculum Development (ASCD) also refers to pedagogy as Meta Curriculum' in modern terms. Because the metacurriculum, which is structured differently for different classes, such as subject-specific curricula, essentially dictates different skills or techniques that essentially create a few kinds of skills. The student can learn and acquire some skills. The latter can serve the objectives of the subject. These skills are-

(a) Thinking Skill—Decision making skills, problem solving skills, creative thinking skills etc.

(b) Symbolic Skill—Concept mapping is an example of this type of symbolic skill as we think through symbols.

(c) Familiar and innovative skills— Any thinking skill develops from a familiar focus. Here usually distinction between two subjects, causal relationship etc. prevail. In all cases, students can be given

opportunities to practice innovative thinking. This skill can be practiced by connecting one subject to another.

(d) Practicing and structuring skills—Any skill needs to be practiced to improve it. With practice, their experiences naturally begin to reorganize and expand.

Modern pedagogy helps students construct knowledge with these skills. There are some differences between insturction and this approach. Innovation and activities are its basic components. This comprehensive initiative based on school subjects is metacurriculum, commonly known as pedagogy. That is, the modern relationship between cuirriculum and pedagogy is that of planning and implementation.

4.7.3. Textbook - Textbook is actually a document of translation of the plan into practice. Here is an idea of how the plan will be implemented. Subjects are organized according to common thematic objectives. Along with the concept of curriculum and pedagogy, the concept of textbook has also changed. Earlier only the arrangement of topics was the main function of textbooks. Currently, apart from the content format, textbooks are being prepared that are suitable for creating the skills of the students to acquire appropriate knowledge. Here, information exchange is not the key, information will be given as much importance as it will be useful for acquiring thinking skills. That is, the strategic arrangement of information or theoretical content is characteristic of modern textbooks.

4.7.4. (Knowledge) - Prior learning material will actually help the learner to build knowledge. so that he can combine and form new ideas and concepts, It means also a holistic effort to learn new concepts by applying one's own processing and thinking. It takes the form of acquisition or knowledge construction. That is, the outcome of the learning process is knowledge construction.

4.7.5. Active Participation The students are divided into small groups and are told about the objectives of teaching mother tongue as a primary school subject. For example-

(a) listening with sense and understanding by listening,

(b) reading with understanding of meaning and getting pleasure from reading.

For this purpose a subject should be selected and practiced on how to determine competence from it. Here is an example verse-

Autumn has come,

after the cold wind

In the morning grass

Along the dew line.

Indicate what kind of thinking techniques can be developed on the basis of this Small groups will present it through discussion among themselves.

4.8. Summary

Students will construct knowledge through holistic practice, exploration and application of isolated information. He will be assisted by teachers. Various methods have been prescribed. It can be practiced through conventional subject-based curriculum. Here are some examples of that practice. Techniques of scientific inquiry can be analyzed. The role theory fever in scientific research is discussed. These steps can be applied not only in the science laboratory, but also in the educational environment. Mathematical Process, the sociological method has to overcome Some parameters. It is set in every case. Perspective dependence is the one of the conditions for successful learning. Project method plays a significant role in traditional education. The basic principles of learning are possible through the project method. The close relationship among the lesson, textbook, student and pedagogy is present although the relationship is not linear.

Knowledge, information, Scientific Inquiry, Knowledge Construction, Context, Project Method,

4.9. Unit End Exercise

1. Determine the relationship between knowledge and information. Determine its educational significance.
2. Explain the concept of knowledge construction in mathematics education with examples.
3. Mention the various stages of the scientific research process.
4. What are the identified skills in mathematical methods?
5. Analyze what is meant by information from your direct experience.
6. Illustrate with direct examples the educational significance of the two concepts information and knowledge. Consider: In the learning process-
7. How one can connect letters and words in the first level of language learning?
8. Which aspect of knowledge construction is most important during mathematics education?
9. What methods should be used to help students to investigate in science education?
10. What are the main features of exploratory learning method. Give examples of application of this method in social studies.
11. What are the characteristics of modern curriculum concepts?
12. Does pedagogy include metacurriculum?

UNIT 5

The student and his perspective

5.1. Introduction

Students are not isolated units. In modern pedagogy he is considered a part of his environment. The process of becoming part of this environment and gaining knowledge through holistic observation leads to appropriate permanent behavior change. Thus perspective is given special importance in our 21st century education system. The technique of perspective-based knowledge acquisition will be discussed in this chapter. This chapter will also discuss how our thematic curriculum can utilize this strategy. Ideas will be carried forward through activism and experience.

5.2. Objectives

At the end of this chapter, the student will be able to acquire the following skills:

(a) Tracing the thought process of the learner and suggesting alternative paths.

(b) To have a clear experience of how the concepts of daily life influence his thinking.

(c) Direct experience of how situated cognition takes place.

(d) Gain hands-on experience of how to apply relevant topics based on various real-life situations throughout the course. The various fields are- (i) Language, (ii) Social Relations, (ii) Individual Existence, (iv) Equality, (v) Rights. and its relationship with education.

(e) To dispel certain misconceptions about children and adults.

5.3. Alternative Frameworks of Children's Thinking

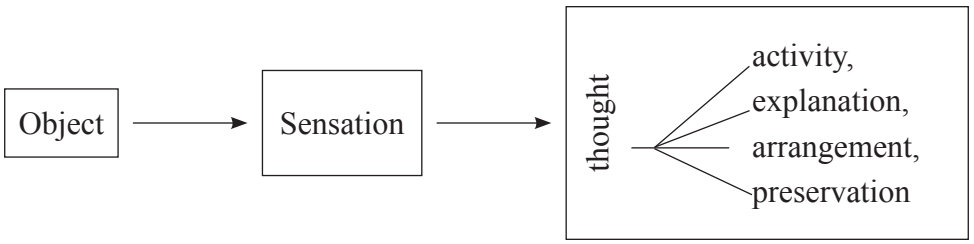
5.3.1. Activity:

All trainees were asked to draw a picture of a page in their notebook. It can be seen in the classroom Maybe 30 out of 50 have the same drawing and the other 20 have different pages. That is, although the matter is known to all, some people have thought about it differently. This is alternative thinking.

5.3.2. Nature of Thought Process:

Thought is the process by which information stored in our working memory is controlled and transformed. That is, any stimulus coming from outside comes to the person's memory and takes a prominent form through various processes. This particularity manifests itself in the difference of thought from person to person. Let's say that every passer-by can see a tree while passing by the road. That is, a special form of information is reaching all people through the senses, but when asked to talk about that tree, different people will express different thoughts. That is, the feeling about that tree is the same, but that feeling is expressed in different thoughts by getting different interpretations and arrangements.

Active participation: The instructor asks the students to express their thoughts about a tree or object located outside the classroom. The work can also be done in pairs. Then he can explain-



It can be very easy to think that what is the significance of learning to think in the classroom? Why should the teacher know about the different types of thinking strategies of children and students?

Because these processes need to be mastered by the master teacher in order to keep pace with the changing world. Below are some examples of different thinking techniques:

(a) Deductive Reasoning

(i) All men are mortal — I am a man — I am mortal

(ii) 2 is older than 1—3 is older than 2—3 is also older than 1

(b) Inductive Reasoning

(i) In my experience all Hibiscus flowers are red. So each Hibiscus flower is red in color.

This type of thinking is empirically dependent upon experience but has some limitations. This is because the thinking of Hibiscus flower is incomplete because it is not related to other colors of flowers, and at the same time this thinking technique based on experience is strong as it is based on experience.

(c) Creative thinking

Solve problems in his own way without following any standard method. Such thinking may or may not be accompanied by intelligence. His standard of excellence in the classroom may not be high. But fostering relationships is very much the teacher's specialty.

Case Study

Sriparna Ghosh, a very senior teacher, presented a few pictures and lines of poetry in class VIII. All were monsoon related. He then asked the students to write something about the rainy season in nimum: 100 words. Everyone tried to write something and showed it to the teacher. Only Payal described the seasons in rhyme in a complete poem which was quite different from all others in her class. The teacher saw the expression of creativity in her writing and read it to everyone.

A question comes to mind here-what was the role of the teacher in demonstrating creativity in this incident?

(d) Critical thinking : Critical thinking refers to a thinking process in which any information is accepted through empirical analysis.

As today's world is full of endless information resources, it is imperative to have an analytical perspective on how much and which information is needed. That is why modern psychologists have placed special emphasis on the practice of critical thinking in the classroom.

Active Participation: The teacher will ask students to think on a particular social issue such as social discrimination and transce students will be divided into groups and provide feedback. The main terms of opinion are-

(a) students' own willingness to participate, (b) understanding of the context of the subject, (c) clear knowledge of his own idea,thoughts and beliefs, (b) analytical ability

A number of specific skills are necessary for students to develop judgmental thinking (Ennis 1987).

- Focusing on a particular problem.
- Analysis of various judgments and reasons raised around this issue.
- Presentation of questions and answers to clarify the topic
- Reasonableness of statement of issue and evidence
- Expressing the problem Adjudication of monitoring reports
- Judging by ascending and descending method
- Value judgment of the matter
- Judging the various terms and definitions associated with the problem
- Judging preconceived notions about the topic
- Identify things that are not proven but assumed.
- Determine possible solutions
- Exchange opinions with others

To practice argumentation skills, the instructor can select a topic so that trainees may discuss in small groups.

5.4. Everyday Concept and Situated Cognition

Let's start with a story first. Salilbabu was about 40 years old when he first personally owned a computer. Although proficient in official writing, he found it very difficult to write on the 'keyboard' at

first. So far he has read books to solve any problem, so he opened the computer book and started trying to run the computer. He soon became frustrated and exhausted. Eventually one of his junior colleagues asked him to use the computer more to solve problems as needed and started helping him. Eventually it turned out that he had become adept at this too. Three questions can emerge from this story.

First of all, Salilbabu is an experienced worker and a prudent person. Why he could not solve the problem?

Second, why was the advice of junior colleagues necessary?

Thirdly Salilbabu brought What kind of change in his life.?

These questions should be put before the trainees and the answers sought. It remains to be seen whether this incident reminds us any experience or not. Some may remember the first of mobile or smart phone experience.

One thing that is very clear through all the discussions is that everyday experiences significantly influence our knowledge acquisition strategies. What we learn, what we think, and what problems we solve are largely based on everyday experience.

Example 1: If I write 8 and ask what is written most students will interpret it as eight / four. Those who are not familiar with English numerals will definitely call it four. Because in their experience it is four. That is, direct experience is the main means of gaining ideas.

Example 2: U-This symbol will be considered by students to be one of the English letters while teaching English language. In teaching physics it will be considered as a laboratory instrument and in teaching geography it will be identified as a horseshoe shaped lake. That is, the same sign carries different signals depending on the experience.

Everyday direct concepts are most helpful in building a child's knowledge. Rabindranath sought to build children's knowledge by highlighting such contemporary direct experiences in his children's stories and poems.

Active participation : Trainee students will be called upon to exemplify such content. Everyday experience is here the means of knowledge construction and concept construction.

- **Situational Cognition**

The concept of perspective-based or context-based knowledge acquisition is inherent in judgmental pedagogy. This pedagogy leaves behind the debate regarding the comparison between individual's mindset and environment related to acquisition of knowledge and gives equal importance to both.

Activity :—

(1) A picture shows Kokil, Palash, and Abir or Pichkari. A subject can be easily identified by connecting the mental processes with special characteristics to a particular concept by the students. The name is springtime.

(2) If another picture shows chairs, tables, desks, bells, blackboards, etc., students can easily identify the school. All of these are the simplest forms of perspective-based knowledge acquisition techniques. As the mental process progresses the more complex the perspective dependence becomes.

Must remember-

(1) Body and mind are not considered as different in attaining context/perspective dependent knowledge

(2) It develops through interdependence between observation and activity.

(3) Individual is not a separate subject within the environment. A special part of environment or context is the individual. For example, the cuckoo is a particular part of the spring or a part of the overall vision.

(4) Knowledge gained through real life experience is again applied to solve real problems. For example, when additions subtraction are taught to young children, it becomes easier. If practically can be done by buying stuff in a store. Here we see two types of phenomena-

(a) Can do 10-5 in the khata but can not tell how many items were bought after payingto rupees to the shop and getting back 5 rupees.

(b) Again, if he/she does the calculation at the shop easily, but will not be able to do it in khata

We have to think about which one we prefer. In the first case knowledge acquisition is not perspective dependent. And in the second case the observation is not comprehensive. Neither situation is desirable in our education system.

Perspective-based knowledge acquisition techniques-

Social observation - Application in Appropriate Areas

That is to say whether the knowledge acquisition strategy is context dependent or not is judged through application in appropriate cases.

Hence the overall learning process will be participation in social activities.

Piaget and Vygotsky are said to be the main propagandists of this doctrine. In the thoughts of two educationists of our country, Rabindranath and Gandhiji

Social participation and physical labor are given considerable importance in the educational spirit. Such planning succeeds by creating small groups of social participation.

Active participation: Divide trainees into small groups and list the types of small groups they belong to. Eg-A person (1) is a member of a singing group. (2) Member of Special School Student alumni Ex. (3) Member of neighborhood club, etc., may exchange views as to what kind of experience he/she is achieving as member of any group according to that list. Finally, one thing will be clear that acquisition of perspective-based knowledge happens through social participation, which is an applied process and dynamic.

5.5. Pedagogy Across Curriculum for Contextualization

5.5.1. Knowledge based on language learning and perspective

Case studies 1

1st class teacher Reshmi is teaching sound of ‘b’ (Ref Tess India)

Case studies 2

Letters, sounds and words in class-rooms

Elementary English (1st to 8th class)

5.5.2. Acquiring knowledge based on perspective on social relations and personal identity

Activity :—

Trainees will be asked to discuss the differences between family relationships and social relationships. The names of these relationships will be written on the board.

Family Relationship	Social Relations
Father Mother	Helper at Home
Grandmother Grandfather	Teacher, Shopkeeper
Uncle Aunt	Classmate, Colleague

The difference between these two types of relationships must be considered. Relationship formation varies from person to person. Its main reason is that individual children's differences related to perspective usually depend on many factors like - (a) family, (b) age, (c) skills, (d) ethnic or class position, (e) Sex (f) language, (g) Mental characteristics, (h) Religious characteristics (i) Economic status.

Active Participation : The teacher will give an example to the trainees. For example, some families consider the teaching process to be a joint responsibility, while some families consider teaching to be the sole responsibility of the institution. The second case is different from the first case. Hence the social relations teachers with children from two families are likely to be different.

Students will be asked to give one example from each such element. Education becomes relevant in each instance.

The learner develops a self-concept that is completely determined by his socio-cultural environment

Activity: Students are asked to find answers to a few questions-

(1) Who am I? (2) What am I? (3) How do I come here. (4) Why do I come? (5) Where do Itt want to reach?

Writing down the answers to these questions will show that the answer to each question is determined by the socio-cultural environment.

Who am I? This identity is determined by the social environment.

What am I? These perceptions, feelings and ideas are determined by society.

The answers to the questions of how I came and where I want to go depends on the student's self-concept.

What role the learner will play in the learning process depends on this self-concept.

The lessons are given Below

(a) Who is competent for which lessons?

(b) How one learner will be engaged with specific lesson?

▸ Case study 1

Mansi is a 9th class student of a co-educational school. Growing up in joint family, Mansi saw all her sisters in the house well endowed with arts but afraid of maths. From the family she learned that girls are like that. But she loves Maths personally and it is seen that teacher engages her for solving mathematical problems in the classroom. In this way gradually she gained confidence asshe could correctly solve sums in front of others and Manasi scored highest inthe first summative evaluation of

her class.These satisfaction and confidence inspired her to solve more sums and she became determined to pursue her studies in mathematics.

Questions to think about:

(a) what is the source of her self concept?

(b) How did her life goals change?

(c) In this case what perspective could defer her?

(d) Which perspective did help her to change herself?

Case study 2

Rabin is a student of class VIII. He can't make good result but play good football. Not doing well in the exams gave him the impression that he would not succeed in anything. But he become selected for the football team for the school. His goals in two consecutive matches helped the school to win. Everyone praised him and he started to feel valued again. His effort in everything increased somewhat. As a result, there is little improvement in education.

Questions to consider

(a) What is the source of Robin's spirit?

(b) What are the reasons for the change in his self-concept?

Self-concept develops based on social context. It is expressed in various ways in the field of education. It essentially determines future success.

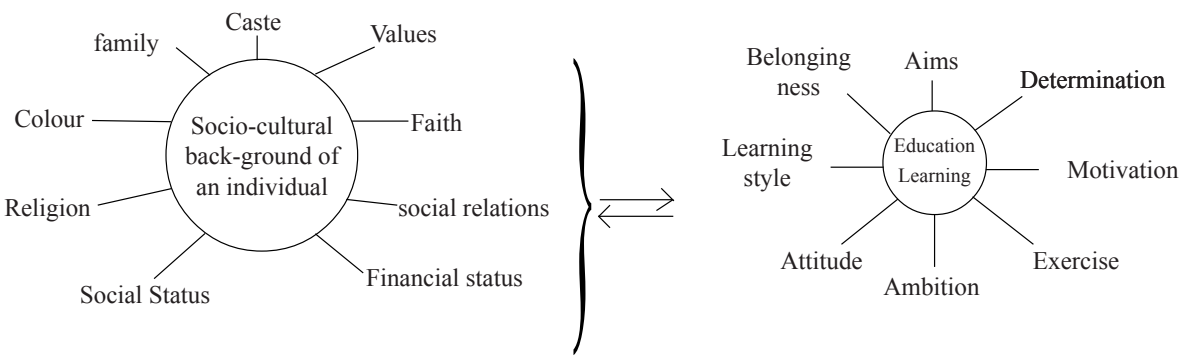
(a) Being self-aware of his own abilities, a student can decide what work is possible for him and what is not.

(b) The ability to stick to a task or doing practice depends on self-concept or spirit.

(c) It is easy to set the goal/objective of education if the conception of one's existence is correct.

(d) The level of ambition is determined.

(e) Develops the attitude or mindset of the learner with the help of which the learner can achieve his desired goals.



The main principle in the educational policy of our democratic country is inclusive education for all regardless caste, religion, colour. In order to fulfill this objective properly, social perspectives are to be

portrayed in the subject-oriented curriculum. It is essential to see that caste, creed, caste, sex cannot in any way create any division during the application of curriculum.

Must remember-

(a) Students hailing from various social environments deserve the same attention.

(b) Any matter of cultural sensitivity should be treated with appropriate attitude.

(c) Any lesson should be applicable to learners from all backgrounds.

Three case studies can be presented.

Case study-1

Incident of Paniparul village of Medinipur. More than half of the people in this village speak Bengali mixed with Oriya. When the children here go to the primary school of the village, the teacher observes that a few children speak normal Bengali language and sits in front of them and starts teaching. As a result, 50% of the children who are not used to speaking this language do not speak at all in that class many of them stopped coming to school.

A few questions come to mind from this incident-

(a) What can children who are reluctant to come to school do in future?

(b) What could have been the role of the teacher here so that this problem would not have arisen.

Case study-2

Children from nearby slums come to study at a primary school in Kolkata. Their clothes are always not very neat. many of them leave home in absence of mother. Priyanka is the teacher of this school. She was a student of very famous school. She disrespectfully treated certain members of the class. All those children used to shrink in mockeri with words and clothes. They had nothing to do, they did not get a sense of cleanliness in the home environment.

A few questions arise from this incident-

(a) What kind of behavior should the teacher have for the neglected children of that class?

(b) What changes can be made in the teaching process to improve the classroom environment.

(c) What kind of pedagogy eradicate this difficulty? covering the curriculum could.

Case study-3

Rajesh is a teacher of a remote village in Purulia. This enthusiastic young man always tells various stories to the studentsIn it, there are special customs of different peoples and communities of the state. Along with increasing knowledge of geography, Rajesh introduces students to people of different cultures. Sometimes telling the stories of Rabindranath, Mahaswetadevi or from Aranyaka of Vibhutibhushan. Sometimes by showing pictures, sometimes by drawing pictures with the students, he brings this cultural perspective alive. There are many tribal students in her class. They can speak freely in the class. Rajesh is a very popular teacher.

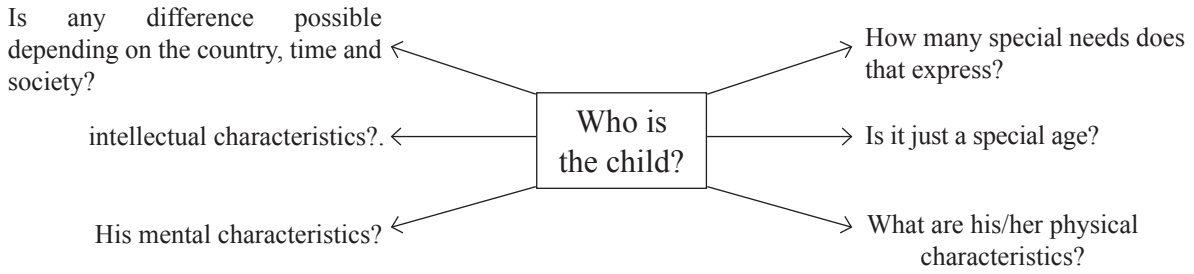
This case gives answer to the question - if the right pedagogy is applied across different parts of the curriculum, it can be enjoyed by students from all social backgrounds.

5.6. Eradication of Child and Adult Misconceptions

Activity :—

5.6.1. The instructor will write the question "Who is the child?" on the board and the trainees can provide a variety of answers. Based on those answers, there will be opportunities for mutual exchange and discussion. The position of the child must be clarified.

Discussion:



That is, the child's existence is not only individual, but his social context constructs his existence. The child is not a separate entity but must be judged according to the social context. No matter how much we talk about equality and human rights, racial, educational, socio-economic differences are present in the society. As a result of this disparity there are considerable differences in the needs and psyche of the children.

5.7.2. The misconceptions about children which are prevalent in the society in general are- (a) Child is imperfect. He/she has to be fulfilled through education.

(a) The prevailing ideas and values of the society should be inclucated into him/her.

(b) Fulfillment of child's own aspirations are possible through education.

Active Participation : The class will be divide into three groups and discuss one by one whether these ideas are wrong or not.

5.6.2. Some Misconceptions about Adult People -

(a) Each adult person are judicious

(b) Capable of solving all problems with the help of intellectual, mental quantities.

(c) The aspirations and needs of the elderly are refined.

Active Participation : The whole class will be devided into three groups and discuss one by one whether these concepts are false or not.

Analysis of wrong ideas

Children are imperfect human beings -- children are immature human beings. His physical and mental development is not complete. But as long as man lives, his development process continues. psychosocial aspects changes through interdependence. It is desirable to consider child also as a developing human being. The purpose of modern education is to enrich his abilities in the learning environment by providing various aids. Inherent abilities, inclinations, judgments etc would need to be developed in an appropriate environment of school.

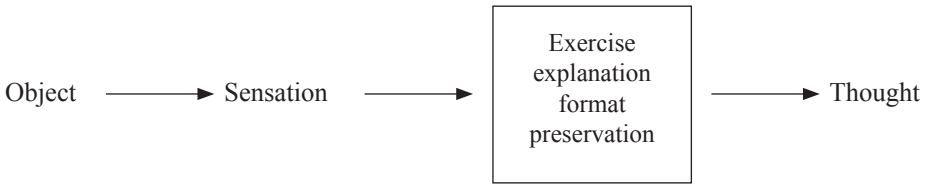
One of the conditions of the school is to provide an environment conducive to achieving excellence. Only adults are judicious--this idea is not acceptable because adulthood is not a condition for judiciousness. Only when mental actions are fulfilled according to the perspective, a person becomes judicious. So being judgmental or not is not dependent upon puberty.

All problems can be solved with the help of intellectual and mental maturity.

Problem solving is a skill which depends on proper thought process. So it is not possible only through mental maturity. This skill is developed by practicing the right method. So regular practice builds this skill. However, people are not capable of solving all kinds of problems.

5.7. Summary

The thought process involves the control and transformation of information in our working memory.



The main thinking strategies are - descending, ascending, creative, judgmental etc. Daily experience and perspective/contexts are helped for acquisition of knowledge. Critical pedagogy gives sameimportanceto environment and contexts / perspectives in mental process. Dependence on contexts/ perspectives is one of the foundations of al knowledge and this situated cognition is important for developingmental processes. Piaget and Vygotsky are the main propagandists of this doctrine. In our country Gandhiji and Rabindranath gave importance to the subject in their educational plans. It is possible to teach specific subjects through practical experience throughout the curriculum. Based on family, age, skills, class position, etc., a child's cultural perspective is formed. Again, this perspective helps him gain self-identity. The identity of the 'child' has to be considered in perspective. It is a misnomer to suggest that a child is imperfect human or he/she is a product of educational devices.

5.8. Unit End Exercise

Section (a)
(Within 500 words)

1. Analyze the nature of thought processes. Explain with suitable examples why it is important to know the nature of a teacher's thinking process.
2. What is meant by critical thinking? What skills are needed to be developed as a critical thinker
3. Why is daily life experience so important in building knowledge? Explain with examples how everyday life experiences help us to construct knowledge.
4. What is the meaning of perspective-based knowledge or situated cognition acquisition strategy? Mention its main features. Discuss with examples how this technique can be applied in our education system.
5. How does the student's self-identity or self-concept develop? How is students self-identity and learning inter related? Explain how socio-cultural context and education are related.

6. Identify common misconceptions about children and adults. Analyze why the ideas are wrong.

Section: (b)
(in 250 words)

1. Explain the thought process. What does alternative thinking mean?
2. Explain ascending and descending thinking with examples.
3. What is critical thinking? What are the requirements?
4. Point out the skills needed in critical thinking.
5. How daily life experiences help to construct knowledge.
6. What is the relationship of perspective dependence to mental processes? What kind of problems are seen owing to dependence upon context/perspective in our education system? Explain the problems with examples.
7. "Perspective dependent knowledge acquisition = Holistic perception + Application to appropriate field" Explain with examples.
8. What is the difference between family relationship and social relationship? How language, language, a child's difference related to perspective with another child is dependent upon language, mental features and economic condition?
9. Point out the relationship of education with self-identity/self-concept.
10. How can teachers apply the characteristics of democratic education in the classroom?.
11. Which aspects of child's existence are to be considered in education and why?
12. Critically analyze the concept of 'child's imperfect humanity is to be perfected through education'.
13. Child has to get used to the ideas and values prevailing in the society'-Critical analysis.
14. 'Only adults are capable of thinking and solving problems'---Critically analyze.

Section C
(in 25 words)

1. What is the relationship between the thought process and the presence of object?
2. Give an example of top-down thinking.
3. Give an example of an ascending thinking.
4. Is creative thinking related to Intelligence?
5. What is critical thinking?
6. Why is critical thinking necessary in modern education?
7. Critical thinking is essential in the classroom and what are its conditions?
8. How educators in our country did apply everyday experiences to everyday teaching
9. Give an example of situated cognition.
10. Illustrate what problems can arise if knowledge is not perspective dependent.
11. Give examples of how individual's socio-cultural context determines his ambitions.

12. Keeping in mind the ‘right to education’, how will the teacher judge the students?

Section (d)

Mark the correct answer.

1. 10 is greater than 5,30 is greater than 10-so 30 is a number greater than 5

   (a) Ascending thinking (b) Descending thinking (c) Creative thinking (b) Judgmental thinking.

UNIT 6

Use of ICT for Pedagogy Across the Curriculum

6.1. Introduction

In the 21st century there is probably no room for debate about the utility or relevance of using information communication technology in basic education at the school level. But "there is some conceptual ambiguity about ICT in education among the concerned people". Information Communication Technology is a subject of study—generally part of theoretical and applied technology.

But when we talk about the application of ICT in education, we mean how teachers use ICT to help students understand the content covered in the curriculum at school level. In this regard, teachers need to simultaneously have the technical skills to use ICT as well as the knowledge of what kind of pedagogical strategies to use ICT depending on the students' mental level, their previous experience and the nature of the subject. ICT pedagogy is therefore an important issue in Teacher education. In this chapter we will discuss various aspects of ICT pedagogy.

6.2. Objectives

By the end of this chapter, students will be able to:

(a) explain what is meant by ICT.

(b) State the general role of ICT in school education system.

(c) compare different types of ICT mediums.

(d) explain what kind of desirable skills teachers need to have in the practice of ICT pedagogy.

(e) explain pedagogical models of using ICT in the curriculum.

(f) Distinguish between conventional pedagogy and ICT-based developmental pedagogy.

(g) explain methods of skill building in integrated learning.

(h) explain the importance of ICT in meeting the multiple needs of children with special needs in inclusive classrooms

6.3.Role of ICT in Education

6.3.1. What is meant by information communication technology?

In the 21st century any education at any level will remain incomplete without the use of ICT. In today's school education, it is essential to use ICT to develop students' abilities and skills, especially at the basic level. It should be noted that the application of ICT in this context does not only mean the mechanical use of computers, tablets, mobile phones, internet, but also establishing a trend in teaching and learning pedagogy, where students themselves use powerful media such as ICT to develop new knowledge and connect with the rest of the world.

According to the definition provided by UNESCO (1999) Information and Communication Technologies (ICT) and a diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information. That is, ICT is the integrated application of a number of technological resources that create opportunities for connectivity, knowledge creation, storage of generated knowledge, dissemination of information and information management. Information creation and information exchange is a major part of any learning process. There is also a long history of successful use of ICT in formal and non-formal education.

The practice character of ICT in application in education is constantly changing. Radio, television, computers, Facebook, WhatsApp, all belong to the wider spectrum of ICT. In today's Network World, interconnected telecommunication infrastructure, specified quality computer hardware, newly developed software, internet connection, mobile phones, tablets, radios, televisions with various apps have connected all corners of the world. But when we talk about ICT in education, we don't only talk about advanced computers connected to the Internet, but also simple tapes, recorders, radio, video, television, can play a very important role in various teaching and learning.

6.3.2. Uses of Information Communication Technology in Education:

Is there any role of ICT in education? Today in school education without ICT can run properly ? Looking for answers to these questions, it can be seen that in a rapidly developing country like India in primary education, there is really no alternative to the use of appropriate ICT to ensure the participation of all children, guarantee their educational opportunities and maintain the quality of learning. If you look at the political and socio economic context of the world today, it will be seen that in the last 20-25 years, in the context of liberalism, the dominance of private ownership, the liberation movement of the United Nations and overall globalization, education has become a science and can be transferred from country to country as a product. India also has to adapt to this competitive environment.

India as a country and a nation is committed to achieving the goals of the Millennium Development. Goals to bring everyone into the arena of basic education. Half of the entire student body in India is under 15 years of age. In order to educate this large number of students, there is no alternative way except the application of ICT in education.

The benefits of using ICT in education can be summarized as follows :

(A) Individualized learning : As the learner can learn as part of a group, as an individual learner can also use the medium of ICT, which supports the learner in the learning material and process.

(b) Interactivity : The process in which the learner can relate to the learning subject, has the opportunity to go forward and backward in a subject according to his own level and needs, and can start learning from any place at any time according to the level of prior knowledge, but the sequence will always be maintained.

(c) Low Cost : Cost per student can be lowest only through ICT system.

(d) Mitigation of distance and climate related problems: Any student can learn from any distance and problems like storms and rains do not stand in the way.

(e) Multiple Teaching Functions: If ICT can be used according to a suitable plan, it helps in learning and gathering information on various subjects, integrated subjects according to the needs of the students, as well as there is an opportunity for continuous practice in the subject of learning. Also specific learning weaknesses of the student can be identified.

(f) Uniform Quality: Curriculum designed to meet specific objectives cuts across rich-poor, urban-rural boundaries when it reaches students.

Following is the list of current ICTs in India which can be divided into Synchronous and Asynchronous according to their characteristics. Synchronous means where all students are in the same place or be present at different places but at the same time. Asynchronous on the other hand means where students are at different places and at different times without any difficulty in learning.

Consider:

What are the challenges you may face and how can you overcome them if you want to use ICT in the learning of students in your village's primary school?

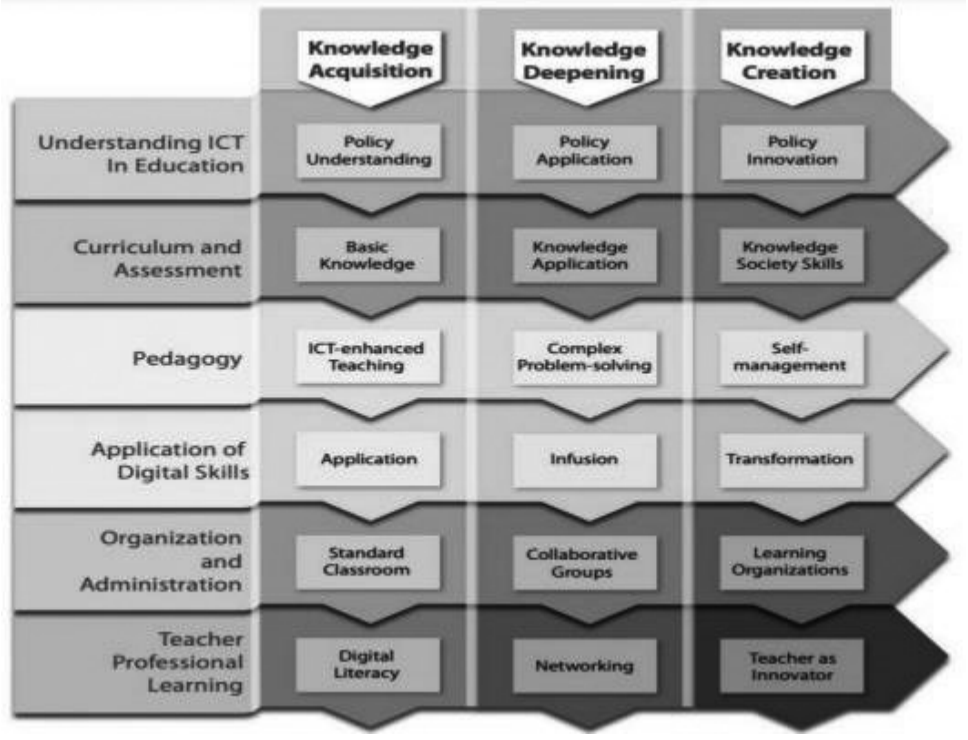
6.4.Use of ICT for Pedagogy Across Curriculum

Sanjay Sikder teaches at Kapashandia D. Para Primary School under Begumpur in Hooghly District. In the third grade, he was repeatedly struggling to help the children learn about 'our environment', which people have built house-to-house arguments and construction industry sayings and stories. It was difficult to convey interest among students and help in the process of forming ideas. He took the children to the garden next to the school. He took me to the garden and asked me to see the nests of different birds. Some students found some rat holes there. Sanjay Babu took all the students to the big termite. He told the students that it is the home of termites. The problem was that the students wanted to know again and again what the inside of the mound was like. This time Sanjay Babu was in trouble. Sanjay Babu collected a video after a lot of research. This video had a thorough activation and explanation of the nesting techniques of different animals, especially how Termite mounds are formed, how the temperature inside the mound remains constant despite the changing seasons, the termite journey. Sanjay Babu showed this video to the students and took the discussion of this chapter forward.

Many people have had experiences like Sanjay Babu's above. In teaching and learning, there are opportunities to be used in all fields. However, successful application of ICT in learning is not possible without the scientific method inherent in teaching and learning. Pedagogical practices of using ICT in the curriculum will be discussed later in the sub-unit.

6.4.1. Desirable Skills of Teachers in ICT Pedagogy Practice:

The scope and success of ICT application in school education depends solely on the ideas, knowledge, skills, and overall competence of the teachers. UNESCO (2014) — in "The Education for All Global Monitoring Report" mentions An Education System is only as good as its teachers. UNESCO (2009) has identified the following competencies for teachers in professional training for teachers in ICT.



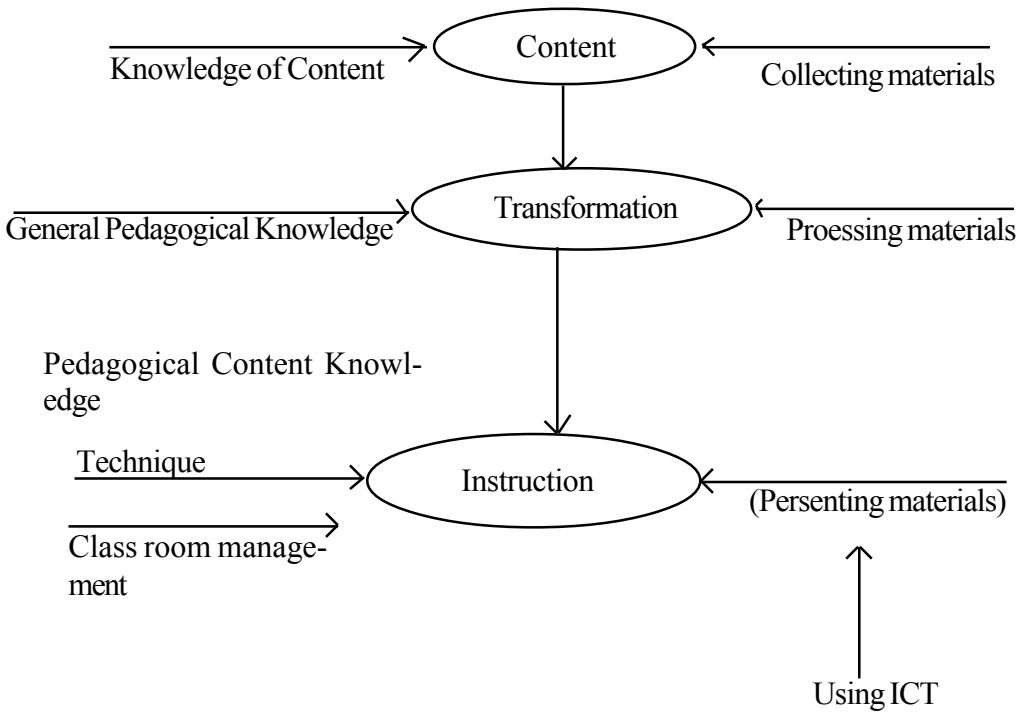
6.4.2. Pedagogy of using ICT in curriculum:

Successful application of ICT to develop students' understanding of specific content depends on appropriate pedagogical strategies. Educator Shulman (1987) identified key areas of knowledge to help teachers learn.

- Subjective knowledge
- Knowledge of general pedagogy,
- Knowledge of curriculum
- Knowledge of subject specific pedagogy
- Knowledge about students and their characteristics
- Relevance of learning
- Aims to develop the philosophical, historical and values of learning

All the above knowledge and concepts are essential and very important. Pedagogical content knowledge, enhances Teachers integrated knowledge of subject matter , pedagogical and professional competencies. The ability to use ICT in learning depends on the combination of this subjective pedagogy with the technological knowledge of ICT—what can be called the Technological Content of Knowledge.

Exactly how a subject material is integrated with ICT and transformed into instruction. It can be represented by the model of Changeain, Shus (2011).



In fact before determining the pedagogical strategy of using ICT in schools at primary and upper primary levels, it is necessary to remember that today's students are very familiar with technology and in some places, students' technical knowledge and application skills are more than teachers. Therefore, it is necessary to assess students' knowledge and skills about ICT in any class of student learning.

Application of ICT in classroom learning is a very complex process. This requires teachers to advance through appropriate planning, pedagogical strategies, implementation, evaluation and continuous innovation. In this case, the pedagogical strategy is important in concept formation from the content of ICT.

Applying ICT in teaching and learning with appropriate pedagogical techniques always helps students to read concepts and they learn easily. Academic James Kulik (1994) analysed at least 500 research papers that showed—

- Students learn more when they are provided with Computer Based Instruction (CBI).
- Students can learn in much less time, with computer assisted instruction.

- Students prefer their classroom teaching more when they are assisted by ICT in learning.
- Students develop positive attitudes towards ICT only when they come to school and receive support. However, it is also true that computers may not play a role in all aspects of learning.

From the research, it can be seen that the application of effective ICT is only possible when the teacher and the used software can use ICT together and through this can challenge the students' thinking and idea formation. Students are stimulated to learn individually or in groups if appropriate activities are brought through ICT.

Pedagogical strategies that teachers will be responsible for practicing in learning content in the curriculum—

(i) Assess the potential and relationship between subject concepts, methods and ICT usability.

(ii) Selection of appropriate ICT materials through deepening of subject knowledge of teachers so that learning objectives can be achieved.

(iii) The teacher should be aware of that how ICT can change students' thinking processes can increase the depth of knowledge.

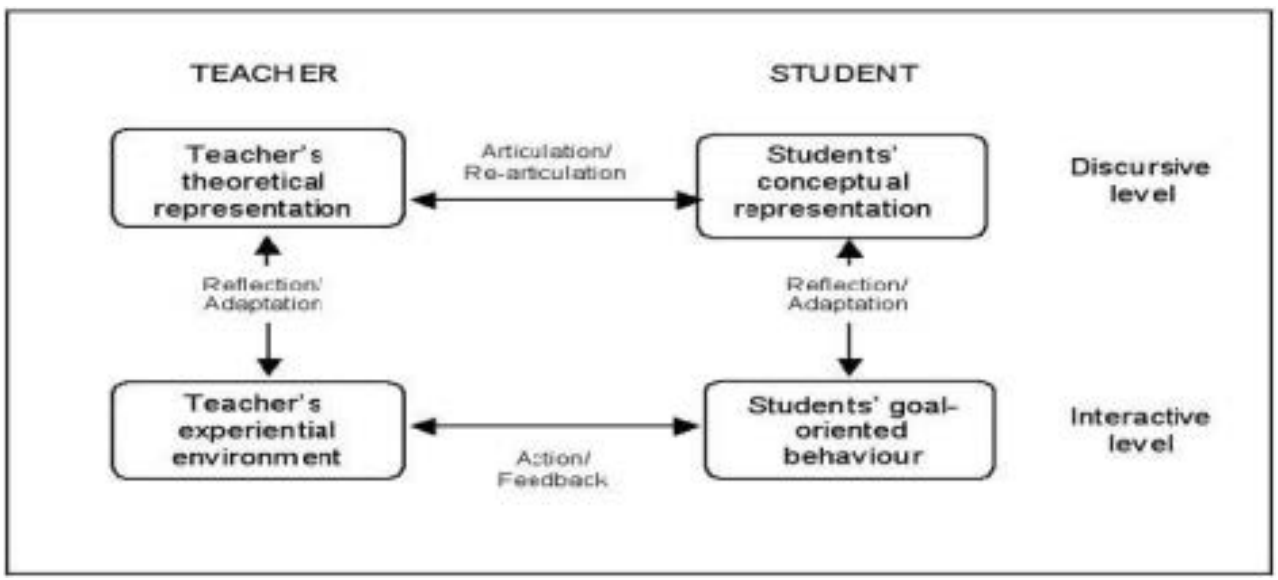
(iv) Teachers' confidence should be increased through progressive use of various ICT components.

(v) Learning to appreciate the positive changes in students' presentation of subjective knowledge and students' conceptualization process through the use of ICT.

(vi) Use of ICT in the curriculum should be designed in such a way that the students' concept of reading, multidisciplinary thinking and helps in reflection of thoughts.

(vii) The teacher sould also learn to apply ICT based teaching learning plan in single student, pair of students or group of students.

Here the conversational framework of ICT pedagogy given by the educator Lawillarel (2000) can be presented which is applicable to any level of students. Where the teacher discusses this pedagogical strategy, basic principles and strategies with students, comments on student participation and skills , interaction between teacher and students continues in periodic learning exercises.



It is clear from the discussion above that in the knowledge society we have come to ICT integrated learning which is different from traditional pedagogical techniques. How ICT integrated pedagogy changes from traditional pedagogy can be modeled by educator Voogt (2003).

Aspect	Less (pedagogy in an industrial society)	More (pedagogy in the information society)
Active learning	• Activities prescribed by teacher • Whole class instruction • Little Variation no variation in activities • Pace determined by the program	• Activities determined by learners • Instruction for Small groups • Different types of activities • Pace determined by learners
Collaboration	• Individual • Homogeneous groups • Everyone help him/herself	• Worthing in teams • Heterogeneous groups • Supporting each other
Creativity	• Based on memorization • Apply known solutions to problems	• Productive learning • Find new solutions to problems
Integrative attitude	• No link between theory and practice • Separate subjects • Discipline-based • Individual teachers based	• Integrating theory and practice • Relations between subjects • Thematic/Planwise • Decision making jointly by teachers
Evaluation	• Summative	• Diagnostic

The overall strategies for implementing ICT-integrated pedagogy in school education can be summarized as follows according to the model of educator Shulman's (2000).

- **Comprehension:** Analysing the content of the text and determining its relationship with other topics.
- **Transformation:** Transforming the learning material in such a way that it is understandable to the students
- **Preparation:** Preparation of course material to meet learning objectives.
- **Representation:** Presenting the prepared topics in such a way that they are presented to the students readily available.
- **Adaptation:** Adapting integrated learning materials as needed to the characteristics of students' age, culture, knowledge level, etc.
- **Tailoring:** Adapting curriculum and learning plans to the needs of a particular class of students.
- **Instruction:** Carrying out different types of teaching activities according to the plan.
- **Evaluation:** Assessing student progress to determine how effective ICT-based teaching and learning is.

With respect to this discussion, it can be said that the application of ICT in the education system leads to a shift from teaching to learning. Students use ICT to participate in their own knowledge construction that is informed by constructivist information. Acting as a teacher i.e. playing the role of a facilitator.

6.5. Capacity Development in the Use of ICT for Integrated Teaching

It is clear from the discussion in the preceding paragraphs that learning objectives can be achieved more easily if ICT is integrated into learning. Meeting the needs of each learner within the team, connecting the learner with multiple components and multidimensional possibilities for learning are created through the use of ICT. But it is undeniable that if the teacher cannot acquire the ability and specific skills to use ICT in every sense, then the benefits of ICT will not be available.

6.5.1. Where the teachers are barriers in the use of ICT:

The teachers themselves are hindered in teaching and learning due to the following reasons-

(a) Lack of time: Time is a major constraint in undertaking general training, self-learning, planning and use of ICT is considered.

(b) Negative experience: Sometimes teachers have negative experience in the application of ICT due to lack of experience encountered.

(c) Uncomfortable Situations: Fear of failure in front of students, in front of colleagues remains among teachers, which can be uncomfortable for them.

(d) Problems of class management: When the number of students in the classroom is high, it becomes difficult to manage the class teaching due to inadequacy of computers and other materials used by the students.

(e) Lack of knowledge of use of technology: There may be various problems at times when using ICT. In most cases teachers do not have the technical knowledge and skills to solve these problems.

(f) Negative mindset of teachers: Many teachers think that computers are actually very complicated and difficult to use and computers sometimes complicate simple tasks and many think that technology has nothing to do with developing teaching skills.

(g) Lack of motivation: In most cases, teachers are unable to go beyond traditional pedagogy and lack of motivation to use ICT.

6.5.2. The Capacity Development of Teachers' in Integrating ICT in Teaching Learning:

Integrating ICT in teaching and learning is very important in improving the quality of basic education. In developing countries like India, the increasing number of students in primary and upper primary has created a huge demand for qualified teachers. Therefore, developing the skills of prospective teachers in the use of ICT in teacher education and teaching - learning is an essential step. Needless to say, since ICT is constantly evolving technologically, while ICT-based pedagogy is also an evolving concept, training in ICT pedagogy cannot be limited to pre-service training. Continuous improvement in-service training is also required.

Educator McDougall (1997) identified and mentioned five main issues in guiding the use of ICT in teacher education —

(a) Proficiency in using any particular software.

(b) Integrating ICT into the conventional general curriculum.

(c) Curriculum changes to necessitate ICT contextualisation.

(d) Necessary changes in the role of the teacher in the classroom.

(e) Emphasis on key theories of pedagogy in the use of ICT in education.

The UNESCO-UIS (2009) standards for training in the use of ICT in professional development of teachers are —

- Proportion of ICT trained teachers at primary and secondary levels.
- How many teachers have been trained in the use of ICT at primary and secondary levels.
- How many teachers are trained to teach specific subjects at primary and secondary levels.

Topics for teacher training should include—

(a) Phases of ICT integration

(b) Mode of instruction

(c) Content knowledge

(d) Idea about curriculum

(e) Concept of desired skills of 21st century

(f) Team efforts in solving problems of using ICT in subject teaching

(g) Continuous creativity and innovation in the use of ICT

(h) Continuous self-evaluation and development

It is not possible to train all the primary and upper primary level teachers in the country on the use of ICT in the traditional way. Teachers can be trained through distance learning as well as some in-service training.

6.6. Significance of ICT in Catering to Diverse needs of Children with Special Needs in an Inclusive Classroom

Today's world's knowledge-based society is built on the principle of social participation of all people. Where all people regardless of their social context ethnic social and religious identity or even their ability to participate in knowledge creation and knowledge development. In view of the international human rights principles of the United Nations, all people in our society who are differently abled, regardless of physically challenged, have equal rights to education. Right to education is one of the human rights.

The experience of the last few decades across the world and in India is that the provision of education to meet the needs of children with special needs has not been developed. This goal can be achieved by adopting appropriate policies, appropriate programmes, financial resources and awareness among all the concerned people in the state.

It is undeniable that the use of ICT has the potential to do justice to the needs of children with special needs. Appropriate use of ICT helps these children with special needs to learn and integrate into the mainstream of society.

6.6.1. Children with special needs and their special needs:

Children with special needs go through many barriers when it comes to learning. Apart from physically challenged or barriers, social, economic barriers are also a hindrance in their learning. There are 180 million (1 million 1 million) children and adolescents worldwide. Those who are specially abled, 80% of whom live in developing countries. Some of these special needs children go through physical disabilities, neurological disabilities, etc. In most cases these children are neglected by the rest of the society due to lack of social awareness, ignorance, superstition, fear etc. Although W.H.O (1980) divided these children with special needs into Impairment, Disability, Handicap groups according to the medical model, but in view of the international policy of the United Nations, all these categories of children are called 'Differently able'.

Children with special needs and their learning problems in specific groups: The table below shows the learning problems of children with special needs (UNESCO 2006, MOSCO).

Type of impairment	Nature of impairment	Functional limitation hindering learning process
Physical impairment	• Neurological and neuromuscular problems - paralysis - weakness - out of controllness • Orthopaedical problems - missing limb - joint movement limitation - handicapped	• Difficulty to carry out fine and gross motor movement including holding the body position and balance. • Lack of control over the coordination of voluntary muscles. • Lack of supportive functions of arm or leg, right-left motor conditioning. • Poor sensation related to muscles and movement functions.
		• Difficulty of doing complex or compound manipulation.
Sensory impairment	• Visual impairment • Hearing impairment	• Difficulty to sense the presence of light, size, shape and colour or visual stimuli. • Difficulty to sense the presence of sound and to discriminate the location, peach, loudness and quality of sounds.

Cognitive impairment	• Mental retardation	• Attention distractibility. • Inabilities in registering and sorting information in long term & short term memory. • Inability to Control over both motor and psychological events at the body level. • Difficulties in higher level cognitive functions like decision making, abstract thinking, planning & imagination • Difficulties in identification & recognition of signs & symbols • Difficulties in determination, approximation and manipulation of mathematical symbols and processes.
Speech and language impairments	• Speech disorders - articulation disorders • Language disorders - expressive disorders - receptive disorders - mixed receptive and expressive disorder.	• Difficulties in enunciating, articulating of phonemes and their combinations. • Difficulties in shifting of articulation position. • Insufficiency of vocal functions. • Difficulties in fluency, rhythm, speed and melody of speech. • Difficulties in using or understanding of meanings of words and their combinations. • Difficulties in application of language.
Specific learning impairments	• dyslexia • dysgraphia • dyscalculia • attention deficit	• Trouble with identification, description and encryption of letters and syllable of a word. • Poor auditory sequencing • Difficulties in identification of numbers and their combinations. • Inadequacy of spelling.

6.6.2. Importance of ICT in the learning of children with special needs:

The learning needs of children with special needs are extensive and wide-ranging. It is only through the appropriate use of ICT that the needs of this special group of students can be met. The areas of application of ICT can be divided into three categories—

(a) ICTs for Compensatory Use :

ICT can be used in such a way that students can directly participate in the exchange of ideas. Students can change their environment through the use of ICT, can use their preferred instincts and overcome natural instincts to learn.

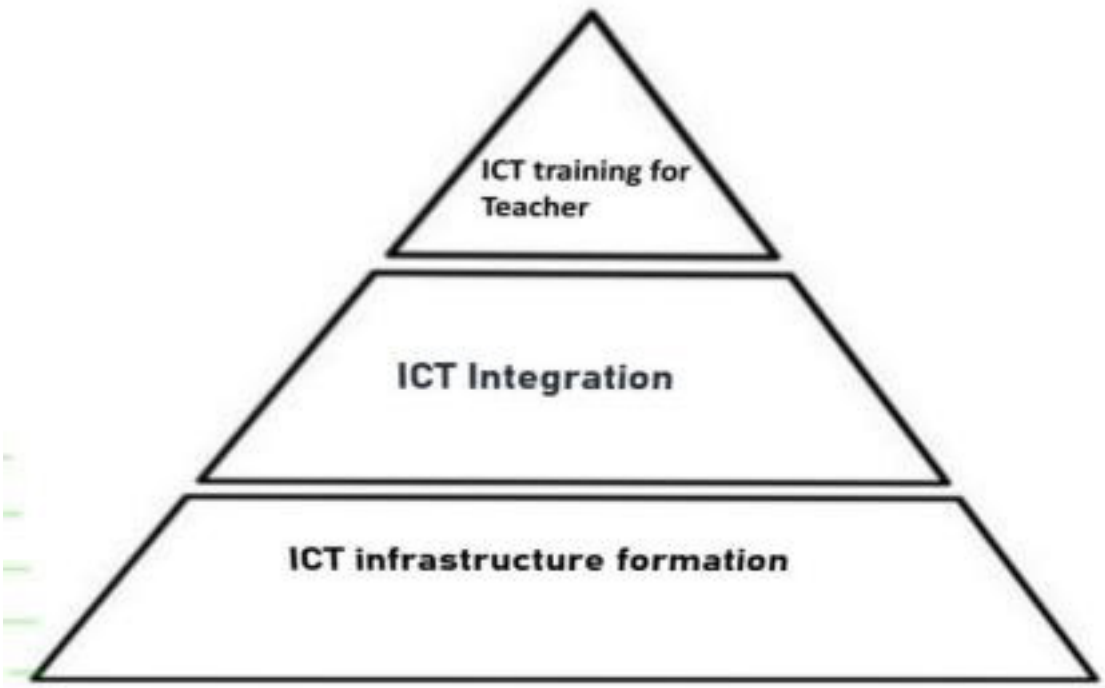
(b) ICTs for Didactic Uses :

The use of ICT in learning can be used as a special method to meet the needs of children with special needs. Different types of teaching strategies can be used by teachers through ICT. ICT is particularly suited to the development of each individual learner in the inclusive curriculum.

(c) ICTs for Communication Uses :

ICT is very effective for communication among children who have speech and language limitations. For students who have certain types of speech and language limitations, the planned use of ICT helps to overcome those limitations.

In inclusive education, teaching these children with special needs first we have to identify their specific needs. Then appropriate teaching methods need to be determined and what kind of ICT will be used should be planned. The use of ICT in the learning of CWSN needs to be done at three levels—



Areas in which ICT can be used in the learning of children with special needs are—

- Early Personal development of each student.
- To develop each student's acquired skills by developing them.
- Ensuring that students can easily access information.
- Social and geographical isolation can be overcome through networking.
- Children with special needs can gain learning benefits from ICT
- Computers can meet individual learning needs of students.

- Children with special needs can learn according to their own abilities.
- Visually impaired people can use the internet to access information just like other normal students.
- Children who have significant learning difficulties can relate to the use of ICT much more easily.
- They are motivated to learn new things as they gain confidence in using ICT.

It can be said with certainty that the usefulness of ICT for children with special needs is undeniable. The benefits of ICT will not be available if teachers are not properly trained and the minimum necessary infrastructure is not developed.

6.7. Summary

Technology is developing rapidly. ICT is developing rapidly and its usefulness is also increasing. On the other hand, the increasing number of students in primary and upper primary and various learning problems are rising. ICT is particularly useful in solving these problems. But can our education system able to use ICT properly?

The teacher himself/herself is the main barrier to the use of ICT. Whether the students will get the benefits of ICT depends on the awareness, attitude and skills of the teacher.

It is often seen that ICT is used mechanically in learning by eliminating the basic theoretical basis of knowledge construction. ICT learning is very active and collaborative. ICT pedagogy is based on constructivism. Students can use ICT to construct their own knowledge if used in a planned manner.

Adequate benefits of ICT can be achieved only through appropriate policy formulation, planning, program design and appropriate teacher training at the state level.

6.8. Unit End Exercise

1. Write the full sentence of ICT.
2. Give two examples of asynchronous media.
3. What is meant by universal quality of ICT?
4. Write the difference between conventional pedagogy and ICT based developmental pedagogy.
5. Explain the pedagogy of using ICT in the curriculum with a model.
6. What does a child with special needs mean?
7. Prepare a list of learning problems of children with special needs.
8. What kinds of problems do teachers face in integrating ICT in the classroom?
9. What topics can be included in teacher training to develop teachers' capacity to use ICT?
10. What skills do teachers need to have to integrate ICT into the curriculum?
11. What are the differences between ICT integrated pedagogy and traditional pedagogy?
12. Mention Synchronous and Asynchronous mediums of ICT.
13. Write the advantages of using ICT in primary and upper primary education.

UNIT

7

Integration of Values & Performing Arts Through Pedagogy Across Curriculum

7.1. Introduction

The purpose of education is to make people better. The main conditions for becoming a better person are Intellectual development, Physical development & emotional development what the great men of our country called Education of head, hand & heart. The teaching of these values is not a separate subject but a specialfeelings of integration of all subjects. This kind of teaching can be done through different techniques throughout the curriculum to create a long-lasting impression on the mind of the students. The present unit will discuss how concepts can be inculcated in students through various performing arts. The concept should be developed on how the practice of Performing arts help in creation of values in society.

7.2. Objectives

Students will acquire certain skills by reading the current unit. For example —

(a) Students will be able to explain the importance of value education in Primary level.

(b) Students will be able to suggest how these value inculcation activities can be implemented across the curriculum.

(c) Students will be able to mention the importance of various performing art (Dance, music & drama) in teaching value education.

(d) Students will be able to apply it in curriculum after getting the concepts of the principles,

significance, techniques & integration of performing arts.

(e) Students will be able to acquire skills to apply the integrated approach of performing arts in curriculum & to motivate learners.

7.3. Value Education-Importance at Elementary Stage, Integration Through Pedagogy Across Curriculum

7.3.1. Nature of values

Before talking about the importance of values in Education what can be said about values. Values are not unidimensional. It has many variations & many levels. Not only practice & impact can be seen in human society but also its manifestation in various ways in the living organism can be seen as a whole. Individual works to fulfil their needs which is really valuable. Again, the individual fulfils the needs of the society. Value education is the teaching of values which clearly affects the physical, mental & social field of a human being.

7.3.2. Types of values: Values are multidimensional concepts. Some of the specific ones which are related to formal education discussed below:

(A) Instrumental values/Intrinsic or cultural values.

(B) Global values & Individual value.

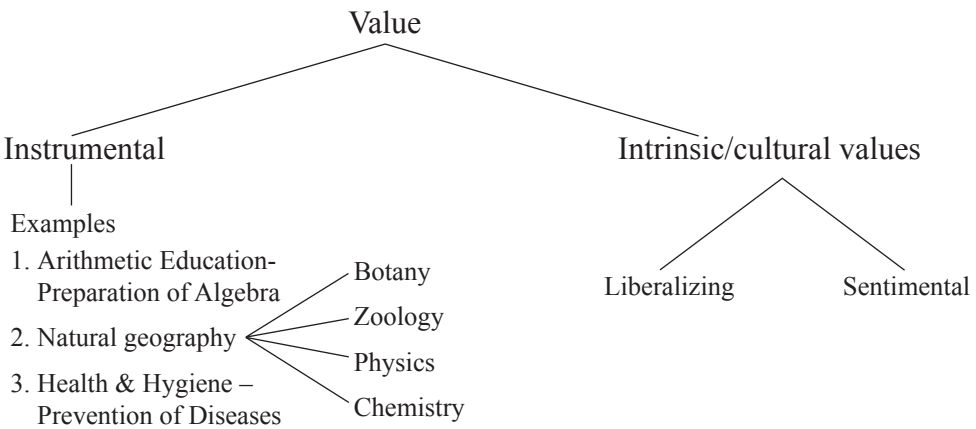
(C) Social value, Cultural value, Institutional value.

(D) Disciplinary value.

(E) Secular values, Scientific values, Ethical values, Spiritual value.

Instrumental values – It not only helps the individual but also in wider sense helps to achieve the larger objectives. For example, teaching of arithmetic is a preparation for teaching algebra i.e in arithmetic lies the objective value. Again, by studying natural geography some directions for acquiring the knowledge of zoology, physics, chemistry etc. can be achieved.

That is natural geography introduces us with many other subjects. So natural geography has some objective values. Again, the knowledge on Health & hygiene directly helps us in adopting preventive measures against many diseases. Socially it has immense applicability because public health is protected in this way.



Cultural/Intrinsic values: - Cultural values sometimes help to create cognitive insights through cognitive practices. Various subjects like literature, drama, music, dance help us to inculcate these values in us. The main significance is that through various subject's various skills, mental activation formation of good habits etc. may be formed. Natural science really creates the attitude of observation & contemplative thinking. Moreover, good Power of expression & ability of understanding is developed through language learning. Democracy, Secularism also develops various social values like compassion, equality, justice etc.

7.3.3. Development of value across Curriculum

Development of values in Education sector is a necessary objective in our country. 'Documents on Social, Moral & Spiritual values in Education' published by NCERT in 1997 pointed 82 values which will be developed in different ways in Education as for example- co-operation, power of taking democratic decision, maintaining peace & social responsibility etc.

In NCF 2005 all these values are directed to apply in integrated manner. Value education is incorporated in every subject & in every class. The assessment/evaluation of value education is done through subject based evaluation. National Education Policy always want to tag the inheritance of cultural heritage with the value Education. These values can easily be instilled in students through applied art i.e., music, dance & drama.

7.3.4. Importance of values in elementary level

Two things are worth noting: If we want to discuss the importance of value in elementary level- we have to think **Firstly,** what type of value Education the learners of 6-14 years will learn? **Secondly,** how values will be connected with school subjects? What is the way of their practice & application?

In the 21st century, it is necessary to build a united, integrated, secular & peaceful India. On the other hand, application of science & technology is also important. Value Education plays the key role to unite these two. Albert Einstein made an important comment in his Book 'Ideas & Opinions' that it is not the ultimate for a human being to develop a special skill because machines & animals other than human being can create skills through mechanical techniques. It is necessary to build a strong & well rounded personality which is not possible without feeling. Aesthetic sense & moral strength can form a well-rounded personality of a person. Primary stage (Age 6-14 yrs) is the most suitable stage for awakening of values. Students minds are very flexible at this age. Through performing art (eg- Music, Dance, Drama) physical, intellectual & affective development of children will be developed. Along with this, the development of values happens in two ways— i) children can realize the value of textual part & ii) children can practice the social & cultured values.

Through performing art several abstract topics can be explained clearly.

- **Case study-1:**

Rupesh, a teacher in Bengali literature of a school at Shimurali wants to explain 'Empathy & Sympathy' to his students. But it is not easy to explain this topic only by reading a book. Then he explains it with dramatization, with the help of the students present in the class. In that class a blind student reads with other normal students & how they can help that special student was nicely explained by the teacher through direct acting.

Case study-2:

Arunima, a school teacher at Murshidabad wanted to explain the main theme of 'WANT PEACE NOT WAR' through some historical events. To explain how personal life & social life will be disrupted due to war, she pointed out what kind of competition they(children) faced in their daily life & how dose the competition impresses them. she narrated a particular incident & asked the student to act it out. Four or five students of that class dramatized it nicely.

Scene I: A group of physically fit students participated in a running competition. One falls on the way to reach the final destination. Someone hurt him a little bit & keep moving forward.

Scene II: In other race, physically challenged students are running towards the final destination. Suddenly one of them fell but by taking him all the students reached the destination with an infinite joy. From these cases the question must be asked before the student- which competition is desirable? Running away without left one or all towards the same goal?

It is revealed that for achieving success it is more appreciable to help others rather than moving alone. Through direct participation subjects create a real basis for students feeling.

In a word it can be said that the significance of this applied art practice in creating values is noticeable. Academicians in the country & abroad have done various researches about it. But all agreed on its necessity.

7.4. Types of Performing Arts, Their Relevance in Education at Elementary Level

Various forms of Applied arts carry cultural heritage & influence the developing human minds. The physical, mental, social & emotional development of a human being is influenced not only by development but also by his sensitivity. However, research suggests that each different parts of performing arts have its own characteristics that regulate teaching learning & development.

The roles that any applied arts play in Personal & Social life are – (a) Extension of personal experience, (b) Social Integration, (c) Contemplative practice of culture, (d) Educational work, Other important roles are transfer of acquired skill from arts, transfer of data & application of physical technique that is its appeal is irresistable in all three levels—physical, mental & intellectual.

The purpose of art can be described in two ways

(a) Solely because of its aesthetic significance.

(b) From the practice & transfer of any skill.

Above two objectives are completely true in case of music, dance & drama but individually these techniques are differently expressed in education.

7.4.1. Dance as Performing Art

Dance is a three-dimensional visual art.

Firstly, it is three-dimensional like sculpture.

Secondly, it involves physical movement what we seen in athletics.

Thirdly, it is an expression of visual literacy. i.e Dance establishes a type of symbolic communication

through different body gestures & mudras. The learning of this symbolic communication is called visual literacy. Hanna, 2010 described dance as a non-verbal medium, which helps to imagine. According to Gazzaniga, 2011 music & dance together play a valuable & vital role in education. Dance with Music develops the sense of timely judgement among the students. Later it helps to understand various lessons in geometry. It also plays an important role in long-term memory & working memory. Dance helps in learning seriation in rhythm also. The concept of rhythm gives the knowledge of time & dimension which helps to build concept in language & mathematics, reinforce the concept of rhythm of ardhamatra (1/2), sikimatra (1/4) in mathematics. Dance also sharpens the power of observation.

From the view of creating social harmony, dance is essential for mutual understanding & coordination. It also helps to do organized work in group which is essential for developing the sense of social understanding. Dance lesson is also useful in teaching children with dyslexia.

Diaz, 2005 got amazing result when applied in language teaching of such students in America. Hetland, 2002 states that dance can promote self-efficacy in group work. Besides dance has another special role in healing specially to get rid of different types of mental disorders. The diversity of Indian society is expressed through dance. In India different types of dance forms are practiced in different region/provinces. So, dance may be one of the means of transmission of social traditions. So, dance has a special role as arts. The dance of different regions of India reflects the social characteristics of that region. Several Indian values, are practiced through dance such as respect, obedience, equality, discipline etc.

Indian Dance has immense contribution in mass education & language education also. Through dance our culture gets more enriched & there is a change to familiar with diversified human population. 'kathak'- the only classical dance from North India basically for royal court expanded profoundly in medieval period. South Indian Dance, on the other hand, is much older but is mostly associated with religions practices. Later, different dance styles emerged from the original classical dance with varied application techniques.

For example, 'Gouriya Nritya', 'Rabindra Nritya' etc. It reviews a progressive culture stream like history. That is, the history of dance is as important as social history. Its educational value is immense. Through Kathakali dance, sign language exchange & learning of communication is possible. Here students with physical or sensory disabilities can get language education through this medium. Mental problems such as attentional defects may be cured through dance.

The prisoners in correctional home have been inspired to live a new life through self-expression & self-development with the help of dance. They are able to express their feelings through dance, which gives them a direction of self-realization really. So, it may be said that to remove any kind of complications, psychological importance of dance plays a major role. As a medium of education Dance is also important.

Lastly it is to be mentioned that

(a) Thematic importance of education lies in dance.

(b) Dance as a means of connecting with subject through education.

(c) It is important in determining the value of content.

(d) It helps in the socialization of the students.

(e) It helps to remove the mental complexities of the students.

7.4.2. Music as Performing Art

The role of music as an applied art is important. Music is the combination of melody & rhythm. It has three aspects instrumental, vocal & combination of the two. But in each case music plays an emotional reaction both in singer & audience. The healing method of music is also an ancient practice.

There have been various research works in the country & abroad about the usefulness of music education, from which we can learn a lot. All of these research findings are promising in terms of the high corelation between music education & teaching learning area. These are also helpful in standardised Test. Music helps in cognitive development also. It has been found that among 25,000 students (Primary & Secondary) in America scored good result in Standardised Test who had minimal exposure to music education. Music education helps to enhance the ability of spatio-temporal judgment which is important for mathematics education. Result of some research works are described below: -

(1) Children who learn music have a richer vocabulary & strong reading ability.

(2) Children with reading disability or dyslexia or low concentration level can be solved by music.

(3) Children who learn musical instruments can easily improve their studies & other activities-better abilities to work in groups, in critical thinking, in completing their school education with academic excellence.

(4) A Standford University study showed that through musical practices such a part of the brain is involved which help to deeper concentration. Beside music helps in guessing & to improve memory.

(5) Music student learn to work very delicately because in the practice of this art all students have to be practiced delicately. Advanced students can expand their mental abilities when this accuracy or finesse is engaged in other subjects.

(6) Another study found that long-term persistence comes from this music education. Student gets the desired result of hard work.

(7) Music education increases experience in group work.

(8) Discipline & culture of practice come from music education.

(9) Music helps in self-expression.

(10) Student learn to be more active in reality & with good observation power through music education.

(11) As music is a performing art students can perform it publicly. As a result, they will be free from fear & risk-taking tendency will be minimised also.

Music Education in Primary Level

Music Education in primary level refers to vocal & instrumental music both. At the very beginning students should be introduced to various musical activities/presentation through which sense of music

& appreciation to music is developed. The first step of music education is to develop the sense of appreciation among children.

From the age of seven or eight music directly taught to them so that they can participate. Researchers agree that music education enhances the overall human development at the same time it also helps in traditional education. As mentioned earlier music education helps in intellectual development.

Research studies of Francis Rancher & Gorden shah in University of California (1994) have shown that children in a week 30 minutes spend on group musical activity & 10-15 minutes in practising playing key board scoring 80% good result in matching at different objects etc. compared to children who did not practice this.

Music lessons are offered in many ways. In many cases it is run by traditional teachers, educators, subject specialists, professional performing artists etc. many institutions take forward the music education programme in association with various voluntary & art organizations.

The three main aspects of music education are :

(a) Acquaintance with different types of tunes & genres of music for the development of aesthetic sense & culture & also creating a sense of knowledge about its source.

(b) Learning various techniques of music, specially learning how to master these techniques. The explanation of what really makes these techniques easier to learn by sequencing.

(c) The exposer of creation of new music or discovery of a new dimension in art should be given special importance in educational activities.

Music education in Primary & Elementary level can influence students in many ways

(a) Communication & sharing in students.

(b) Expression of feelings.

(c) Social skill.

(d) Sence of self-esteem & self-respect etc.

Music education should be a joyful experience to the students & it will determine the achievable goal in life. Music education should never contain any matter of suppression which invites fatigue in the students.

In this education should be one of that will further stimulate the creative emotion of the student.

"Music Learning Line Asia Fringean" was held on 24th & 25th October 2013 in Singapore where a representative of India was present there. The main objective of this conference was to make music education more enjoyable for children & to make them more interested in music. Music is described there as a human right & music is right to all (Times of India Nov 30, 2013)

7.4.3. Drama as a Performing Art

Drama is a very ancient applied art. Human beings have learned to act imitating others since ancient times, to express their feelings. With the advancement at civilization the style of drama has been changed

but it has been practiced since ancient Greek & old age civilization of India. Which it very important from the Socialistic point of view.

Institutional changes in society, functional changes in society, changes in peoples mentality, changes in group thinking & political thinking etc. are clearly captured through drama. Actually, the history of drama holds the history of society. In other words, the dramas of different times become alive when the drama is glorified in the living document of that time.

This practical education has much more appeal than the theoretical education of the common people. Dramas makes the contents of text books more attractive & alive. Like other branches of Performing art drama also has three major aspects.

(A) Cognitive Aspect : Drama always spreads different types of messages- Social, humanitarian etc. which triggers the analytical skill & reasonable thinking. The main component of drama is conflict which motivate the viewer's imagination & power of thinking. So, drama is important when it is used as a methodology of a subject.

The plot or sequence of events of a drama is very important to the audience because many lesson can be learned from this.

The sequence of events evokes the alternative thinking in the mind of the viewers. For example, the sequence of events leads the viewers to the particular scene but they can think what if it was not like that? On the way to this question. The viewers can plan new & alternative way out which helps in creativity among them. This way of thinking is also helpful in constructivist approach. A special period of time is reflected through drama. i.e the social characteristics of a period becomes clear to the viewers. So, it is possible to gain proper knowledge of social characteristics of a particular period through drama.

(B) Conative Aspect : The audience / viewers of the drama is not only the student but also actor in the drama. The physical & motor development occurs through the acting in drama. Because drama in not only language -oriented but also it has immense importance in physical interaction. So, acting is a learning through performances. To express any subject matter through drama physical effort & techniques are most important. Voice modulation is a major aspect in acting. Drama creates intellectual skills along with motor skill.

(C) Affective Aspect : The most important aspect of drama is its affective aspect. The more precisely various scenes are depicted before the eyes of the viewers, the more the affective side develops. An important day in the history of drama-when Vidyasagar went to watch the drama- 'Neel Darpan'. During watching he threw his shoe towards the actor who played the role of tyrannical Nilkar Sahab. The significance is that Vidyasagar was able to became one with the actor through his acting which creates excitement in his mind. During the time of Independence movement various patriotic dramas are used to show which creates excessive excitement in the minds of the entire nation. So, drama plays a major role to inspire moral-ideological values. Several movements or agitations in modern society do not confine in merely social agitations but these will be dramatic movement day by day.

This side of affective aspect is not only person-centred but collective. A literary work only builds relationship with readers but drama plays appeal to collective or multiple emotional states or feelings. Sensitivity also creates through drama. Drama also plays major role in making people aware about

social justice, several problems etc. Drama shows the path of solutions of different social problems & also helps in social education & awareness development programmes.

The Relevance of drama in Education

Drama has been playing an important role in education since time immemorial. Drama is one of the ways through which common people learn outside of traditional formal education today or in past. Common people were aware of those particular characters & his qualities. Our people of India possessed a lot of knowledge apart from literature through yatra acting. The virtues & vices of the characters in our old epics portrayed through acting. Moral values in society were also taught through it.

Positive qualities which are strictly followed in social life acquired through acting.

Language learning is introduced through drama specially spoken language. The significance of language is also expressed. When the children are familiar with the reading of literature, the characters are being alive through acting. The message of literature is being clearer to them. On the other hand, the importance of drama for social education is immense. It is very much useful for the students if several characters of historical events moving alive in front of them. This reading process is also significant. If the students want to acquire skills as a technique of performing art, so many skills other than language education & social education may be achieved through drama which helps in shaping their life in future. For example-

(a) Perfect observation to portray any character perfectly.

(b) Ability to learn & practice patiently.

(c) Realization of closeness with the group & feeling of sharing with all.

(d) Punctuality & discipline.

(e) Being morally strong.

(f) Being physically fit.

(g) Developing the sense of beauty & acquiring the knowledge of perfect decoration.

Many of these are same in other fields of performing art. But in case of drama the individual enhancement can be developed with the help of training & drama uses music & dance together.

7.5. Integration of Performing Art – Principle, Strategies, Techniques

Applied arts are not effective in a student's life singly or separately. These help to achieve specific objectives in an integrated way. It is necessary to apply it in an integrated way, not separately, in the development of aesthetics, values etc. For example, application of music & dance in drama. Even if thematic lessons specify thematic objectives, there are some other goals or objectives of education beyond them. For example, the objectives of social education-is acquiring knowledge about the society & nature around him but after that there is also an objective— to create a feeling about nature & a sense of judgement regarding the characteristics of society & nature which cannot be achieved only by reading books. Exposing these issues to the students with applied art which develop the moral social values & judgemental attitude.

Diversity in competency is observed when all the section of applied art act together. Through the integration of all kinds of applied art groups of learners are formed with different abilities & there will be the opportunities for social interaction among them. So, the sense of "we" will be concretized. The significance of integration of different applied art is to make education holistic by elimination of subject-based, disciplinary based divisions.

To discuss the principle of integration of different applied art we have to mention the vast work culture of our country, especially the culture of art in Visva Bharati. Rabindranath Tagore himself felt the need to organise various festivals, events the main essence of which is "Excitement in joy". He wanted to make his Visva Bharati a nest of piece. The Upanishads' words of joy were manifested through various activities there. However, these practices were not for the purpose of establishing any particular theory but for the nourishment of the mind, for the expansion of the sense of beauty & for the realization of the nature which Rabindranath felt. Applied art is also useful to prepare our mind for any kind of education. The attempt to build or do something in groups could be seen here through the integration of music, dance & drama. Through the song of different seasons written by Tagore there are various ways of knowing which crops, flowers, fruits grow in which month. Without Rabindra sangeet we are not able to know that 'Swet karabi' is a popular flower of the season 'hemanta' in Bengal. Rabindranath indicates the construction of knowledge through the song – "Hemante Kon Basanteri bani jagorone". He wants to indicate about social justice in the drama – "Rather Roshi". He ridiculed the stagnation of mind of human being in his drama "Achalayatan". More over different aspects have been clearly pointed out in his dance drama – 'Shyama', 'Chandalika' etc. in which he has coordinated the different dance styles of the country & abroad.

We have never seen in the history of education such unparallel application & coordination of applied art. So, the modern theory of constructivism is not a foreign concept. It lies in the context of our country which can be found in our education system.

According to the context, class & age of the student coordination of these techniques of applied art can be possible in our schools. Integration of these various types of parts is possible in our school if proper planning will be developed. According to the 'Theory of Multiple Intelligence' (1984) by Howard Gardner learners exhibit or demonstrate their intelligence in different ways where musical, muscular functions are also acknowledged.

So it is possible to develop & show intelligence through the applied art. Subject oriented applied arts training can be demonstrated in modern schools. Specific song or dance can be merged with the poetry in Bengali or drama can be connected to explain some historical events.

As for example, in class VI (History) during the study of the culture of Indian subcontinent there is a part of value education in Literature where a small portion of 'Panchatantra' is mentioned. Students can dramatize one or two such stories of 'Panchatantra' in the class. The name of Kalidas was also in that same text. By reading a poem of Kalidas teacher can help the student to act accordingly.

By acting any story of English textbook uneasiness or inactivity may be reduced in case of second language.

Two songs of Poems in two different languages can be practiced by students so that they can feel the co-ordination & unity lying with.

7.6. Integration of Performing arts for Learners' motivation with special Reference to inclusive Setting.

Ther are some key features in modern education- Creation of knowledge by own, participation by all, learn by doing or activity based learning, integrated learning etc. These concepts can be implemented through performing arts. Specially, compulsory application of performing arts, not optional, may include all types of learners in education.

The role of Performing art is unique to create motivation among students' whatever idleness is there in their daily lessons may be wiped out through the integration of performing arts. Besides, its importance as one of the means of self expression & self-esteem has been told easier.

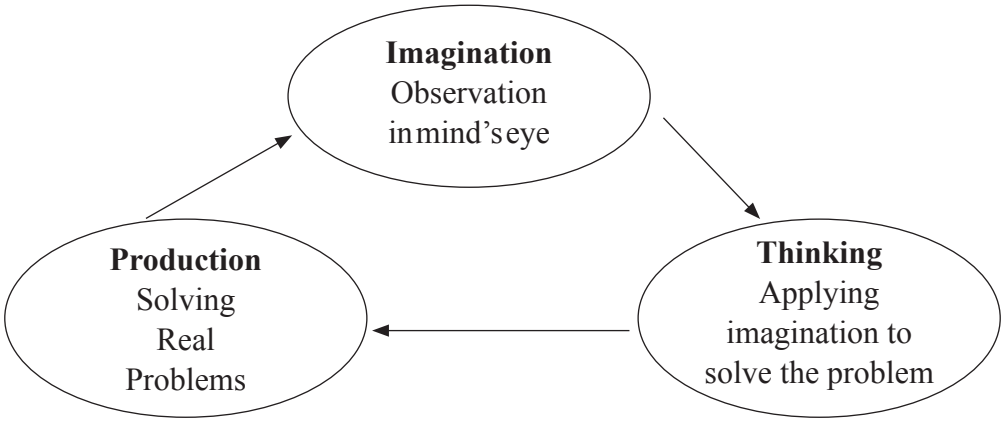
A report was submitted by the then Ministry of Human Resource (MHRD) where the performing art was supported to include in the curriculum as a connector/bridge of Education & Culture Reactions of different eminent personnels from different parts of the country were also invited then. The issue of inclusion & preformatting art has raised time to time. We should create specific mentality towards inclusion. For this some feelings should be inculcated from the childhood days such as feelings of tolerance, togetherness, equity etc. Actually, the attitude of inclusion is developed through the familiarities with different cultures & participation in different cultural activities.

The main components of Life-Style Education are creativity, curiosity, interest, tolerance, bravery, problem-solving capacity etc. Practice of performing art is essential to acquire these qualities.

Education for all is compulsory in Indian democracy. Performing art stands for social justice & right judgment for all. Cultural partnership also arises even in financially backword classes when teaching learning process, music, dance & drama act together. All can be possessors of universal cultural heritage.

Besides, the importance of folk song & folk dance can be felt in education sector. Sometimes the marginalized people cannot be a part of the traditional education because it carries a reflected particular trend of culture. The same problem may be happened in case of language education. But body language & other gestures of performing art removes the obstacles of sharing of feelings. Everyone can understand the message properly. Especially by using that kind of language or paying dignity to folk cultures backward or marginalised people also feel comfortable.

The application of the performing art that is repeatedly referred here is the inclusion of subjects in the curriculum. It is by no means a co curricular or extra-curricular subject. In fact, if we can make education more practical & creative then we will get a transformed education system in 21st century.



How this creative process will be included/accomplished in education is shown below with a diagram.

The above creative process in education only through the practice of applied arts. As a medium the importance of applied art is that it uses all the mental process, perception, imagination, thinking so that learning is more flexible & practical.

7.7. Summary

Human being become more advanced through physical, intellectual as well as emotional development. Development of values is the prime condition to a sensible person. Applied/Performing art is one of the main medium of developing values. Values have been interpreted in different ways by different people. All the values should be considered in each & every fields. The development of values across the curriculum has been repeatedly discussed in NCERT. Specially a list has given for the purpose of familiarizing students with democratic values. Which should be developed in various sectors in education. As per NCF 2006 application of values are linked with different disciplines. The development of values should be started from the elementary level. Through music, dance & drama the Performing art instruct students to develop values in both ways- they can realize the values of text subjects as well as practice socio-cultural values. The different components of performing art influence the developing mind of learners. Each art helps the learners in different ways in terms of physical, emotional, mental support. Any type of Performing art plays the following vital roles – (a) Extension of personal experience, (b) social integration, (c) Practice of culture, (d) educational works.

Modern Pedagogy suggests that knowledge can be constructed through the integration of different performing arts.

7.8. Unit End Exercise

1. Explain the nature of values.
2. Mention the types of values.
3. How dose performing art help in formation of values?
4. Give some examples of objective values.
5. what are the intrinsic or cultural values?

6. What does the NCF 2006 say about values?
7. Is there any need for value education in Primary Education?
8. How would you describe dance as a significant Performing art? – Give your opinion.
9. How dose Indian Dance help in shaping the values of an Individual?
10. Mention the educational significance of dance.
11. State the significance of music education as a performing art.
12. What are the different aspects of music education?
13. What changes can music education bring to students at Primary & lower secondary level?
14. Analyse the significance of drama as a performing art.
15. Analyse the relevance of drama in education with examples.
16. What are the modern principles of modern education?
17. What is the relationship of these principles with the applied art?
18. Which skills are referred as life skill education?
19. What role can applied art play as a part of education in Indian democracy?
20. How performing art can be applied in teaching?
21. What will be revealed when all the Performing arts applied simultaneously?
22. Dance is a "three-dimensional art or visual art"- How? Express it.
23. Analyse the educational values of dance.
24. What roles any applied art plays in an individual's life?
25. What is the significance of practising dance in Indian society?
26. Analyse the role of dance as a medium of education.
27. In what ways do you think effective music education can change the students?
28. Analyse the intellectual significance of dramatization.
29. What is the role of drama in constructivist approach?
30. What skills students may acquire through acting in drama? - Mention at least 4 points.
31. Explain the nature of values with examples.
32. Explain the objective values with examples of a topic based on a school subject.
33. What is the role of values in National Curriculum Framework.
34. Prepare examples of how applied art express the value of a subject

UNIT 8-9

Pedagogy Across Curriculum for Class I-VIII

8.1. Introduction

Pedagogy is the art and science of teaching originally based on teaching learning theory. Actually there is no such shortcut method through which we can assure the intellectual participation of learners. Therefore it is necessary to analyse the content based on pedagogy.

8.2. Objectives

(i) Students Know about content analysis, formative and sumative evaluation.

(ii) To understand the pedagogical understanding across curriculum for class-I-VIII.

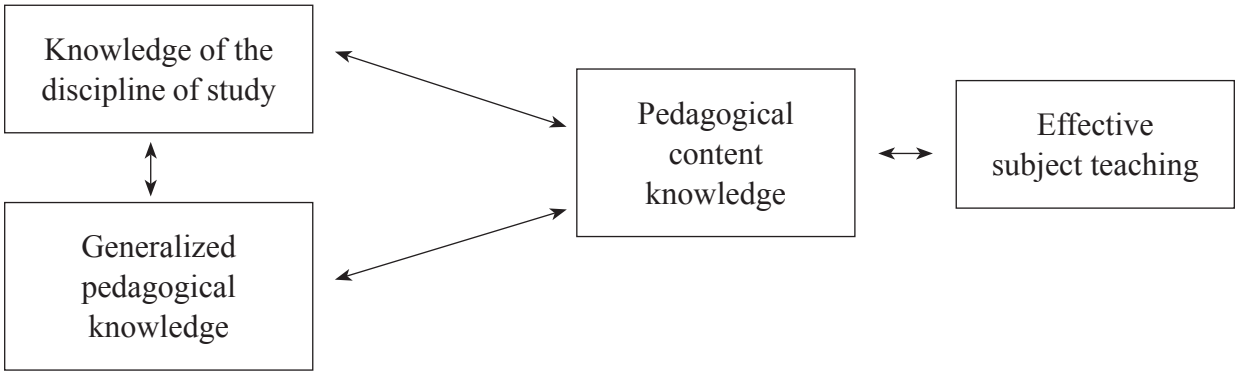
(iii) To understand the concept of CCE and is importance.

(iv) To able to develop questions for formative test and make content analysis.

(v) After the study of this unit trainee teachers of primary and upper primary level will be able to prepare annual academic planning and lesson plan.

8.3. Pedagogical Analysis

The process of analysing the content based on pedagogical Knowledge is called pedagogical analysis. This is not so easy task for a teacher to teach effectively with only the knowledge of selective pedagogy. For effective teaching subject knowledge and pedagogical concept may be expressed through a diagram-



This is important to break the content material for utilizing teaching learning of any subject with proper information. This breaking suggeststhe basis of different components to analyse the content material. The division of content in units sub-units based on learning theories is named as pedagogical analysis.

8.1.2. Theoretical structure of pedagogical analysis:

In order to analyze the content pedagogically four steps are to be followed -

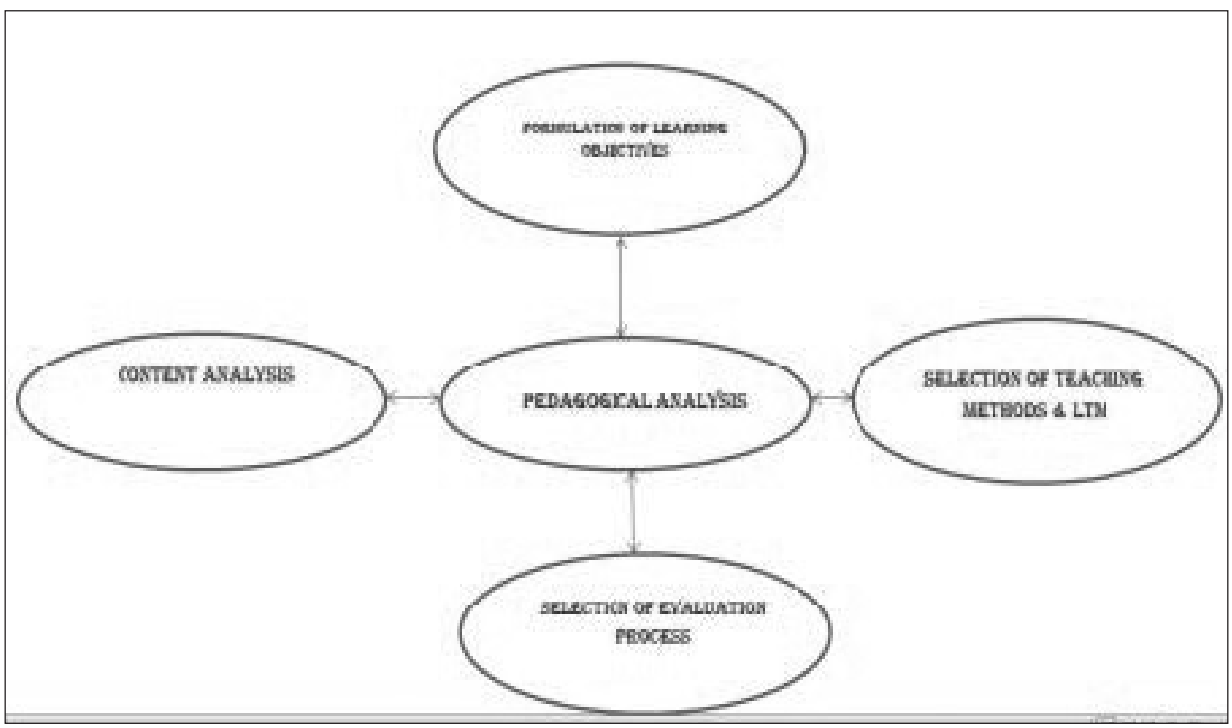
a. Content analysis

b. Determination of specific objectives of the content

c. Determination of teaching strategy and factors

d. Determination of factors of formative and summative evaluation

When these four steps are followed in consequent pattern the theoretical framework of pedagogical analysis is made.



The idea of teaching learning in the classroom is dynamic. Recently constructivism has become much more applicable rather than conventional inflexible behavioristic predefined objective based curriculum going throughout the whole world. Teacher centric classroom has changed into child centric classroom.

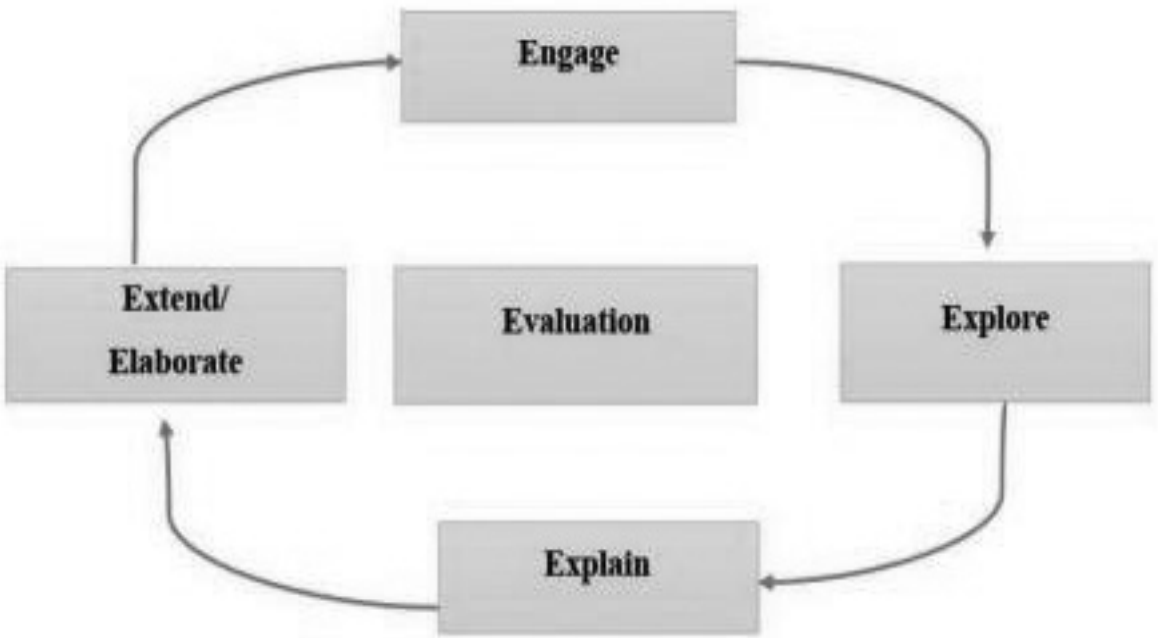
Today's students are interested to learn according to their requirement and utility, most importantly. So the curriculum to be followed is posed on flexible philosophical view. Teachers are not to be autocratic in the classroom that instruction is to reach at proper objective. From this point of constructivism there comes out the requirement of analysing the components of this approach to practice pedagogy.

The relevance and gradual significance of constructivism in teaching learning is considered not only in our nation but also in Right to Education without any ambiguity.

8.1.3. Various concepts of lesson plan

To prepare lesson plan based on objectivism trainee teachers need to mention you need sub unit learning objectives learning teaching materials construction and selection of suitable method and the techniques of using them. On the other hand different new lesson plans are being developed throughout the world. For example, we can mention here ICON Model, 5E model based on constructivism.

The 5 E Model is as follows -



In this teaching learning process trainee teachers need to help the learners to participate actively in the content discussion when they are going to learn. Here comes out the significance of hands on activity or activity based curriculum. This is to be entitled as participatory stage of activity. With the help of proper demonstration of activity the involved students can observe and analyse the content material easily. According toDale this stage is called the stage of Discovery.

Then students try to explain and illustrate the observed points of matter based on their previous knowledge and rationale. In the above mentioned areas instead of directly instructing the learners for their cognitive development, teacher will guide them to construct their knowledge based on their experiences. After that, when students will face cognitive challenges, teacher will provide them suitable instruction to remove their incompleteness of knowledge and to bridge the learning gap.

Later on learners will try to apply their constructed knowledge or concept in other subject areas at the same time in real life situation-consequently their learning will be extended.

Based on the model it may be indicated that other changes of learning is related to the evaluation process also. In this sphere Process Based Approach has received much more weight age than

Product Based Approach. Therefore formative evaluation is more important here. In spite of that learners are free to their subject areas when they prepare lesson plan based on constructivism. It can't be limited to any specific rules or models. Rather based on the age level, IQ level, social economic and cultural background teacher may prepare a new kind of lesson plan.

8.4. Annual Curriculum Plan

8.4.1. Our Environment

Class- III

Unit	Subunit	Content	Period
Body	1. Main external organs of human body and their functions	a. Different sense organs and their functions b. Different body parts and their functions c. Care of body and habit formation	2 (1 hour)
	2. Other animals of the environment	a. Structure of body of other animals b. Earlier and present human body structure	1
Food	1. Plant food and animal food	a. Food of human beings and other animals b. benefits of plant food and agriculture c. Benefits of animal food	2
	2. Food production process	a. Agriculture (farming), cooking, hunting, exporting	2
	3. Packaged food	a. Advantage and disadvantage of food	
Dresses	1. Dress based on seasons	a. Different dresses in different seasons	2
	2. Different materials of dress and their sources	b. Cotton dress and woolen dress	
	3. Dress of different time		2

Unit	Subunit	Content	Period
Houses	1. Living place of human beings (Habitation)	a. Surrounding of our houses and nature of houses	2
		b. Materials of making houses	
		c. Different parts of house and their utility	
	2. Various house building materials	a. Different building materials	2
		b. Houses in disaster prone areas	
		c. Houses of ancient people	
Family	1. Family members and their mutual relationship	a. Who are the members of the family?	2
		b. Close relatives or kins	
		c. Their living ground, idea of address, change of address, location	
	2. Livelihood of family members	a. Livelihood of ancient people	2
		b. Livelihood of today's people	
		c. Family profession	
		d. Professions out of date	
	3. Family and other animals	a. Living ground of other animals	2
		b. Family of other animals	
		c. How are the families of other animals?	
		d. What is the structure of other animals that are not around us?	
The sky	1. The day sky and night sky	a. What do we see in the day sky?	2
		b. What do we see in the night sky?	
	2. Position of the sun and directions	a. What do we get from the sun?	
		b. How do you get sunlight?	
		c. How does sunlight increase and decrease?	
	3. Change of time	a. How does time change?	2
		b. What causes new moon (amabosya) and full moon (purnima)?	
		c. Where are the stars in the sky?	
		d. How are clouds formed?	
		e. What causes rain?	
		f. What is the spindle of colour?	
		g. Concept of horizon	

Unit	Subunit	Content	Period
Recourses	1. Health	a. Concept of good health and bad health b. How to protect our health c. Which foods keep us healthy	
	2. Water, air, soil and green resources	a. Water is our resource- why? b. Why is air and soil called our resource? c. Which is our green resource? d. How to protect our resources	1
	3. Small scale industries and large scale industries	a. What is handicraft? What is its benefit? b. What is large scale industry? What is its use?	2
Precaution	1. Direction of movement	a. Which directions are to follow during walking through the road? b. How can we help others to cross the road?	1
	2. Precautions to use daily instruments	a. Which instruments are used by us in our daily life? b. Dangers come of machines c. Precautionary measures	1
	3. Precautions to use fire and electric	a. How does danger come from fire and electric? b. How to be safe from them	1
	4. Precautions to use water	a. What kind of dangers come from water? b. How can we rescue one from such danger?	1

Unit plan:

8.4.2. Unit – Food

Class - III

Learning Objectives:

1. Clear concept of food
2. Difference between human food and other animal food
3. What is meant by good food and bad food?
4. Knowledge of eating different body parts of plants
5. Classification of food items
6. Requirement of different food items for human body parts
7. Concept of cooking food
8. Different cooking process at different time span
9. Idea of various intake process of food

10. Different method of collecting food
11. Idea of preparing food at present era

8.4.3. Lesson Plan:

Food: Food Preparation

Teaching Objectives:

a. Concept of preparing food in different ways
b. Naturally found foods
c. Food making process- used by human beings before and after
d. How food making process changed time to time

LTMs	Teaching Methods
It is needed to bring different food items like guava, Jamun , potato paper made fish, a packet of savoury snack and something to be brought by the students and these will be kept in all. Then there will be a PPT of food items collected differently for example ● how people ate raw flesh ● roasting in fire ● cooking process acquired ● learned to cook in oven stove, gas, Induction	Students will be asked to identify the food items for example ● raw taken ● cooked, homemade or readymade ● produced by farmers and easily available etc. looking at everyone's list of food taken, the cooking process of every students' houses will be discussed and they will instructed to note it down.

Different methods of food collection

a. Engage:

What do you eat taking from trees?

What is that called?

Can you take paddy directly from the field?

Why not?

How is mixed Savoury snack (Chanachur) eaten?

Does it rot? Why not?

b. Explore:

Make a list of the food items you get from the plants of your surrounding?

c. Explain:

What you get make a list here

Name of trees	What do you get from them?	Do you get that raw?	Do you get that cooked?
1.			

2. 4. 4. 5. 6. 7. 8.			

d. Extend/ Elaborate:

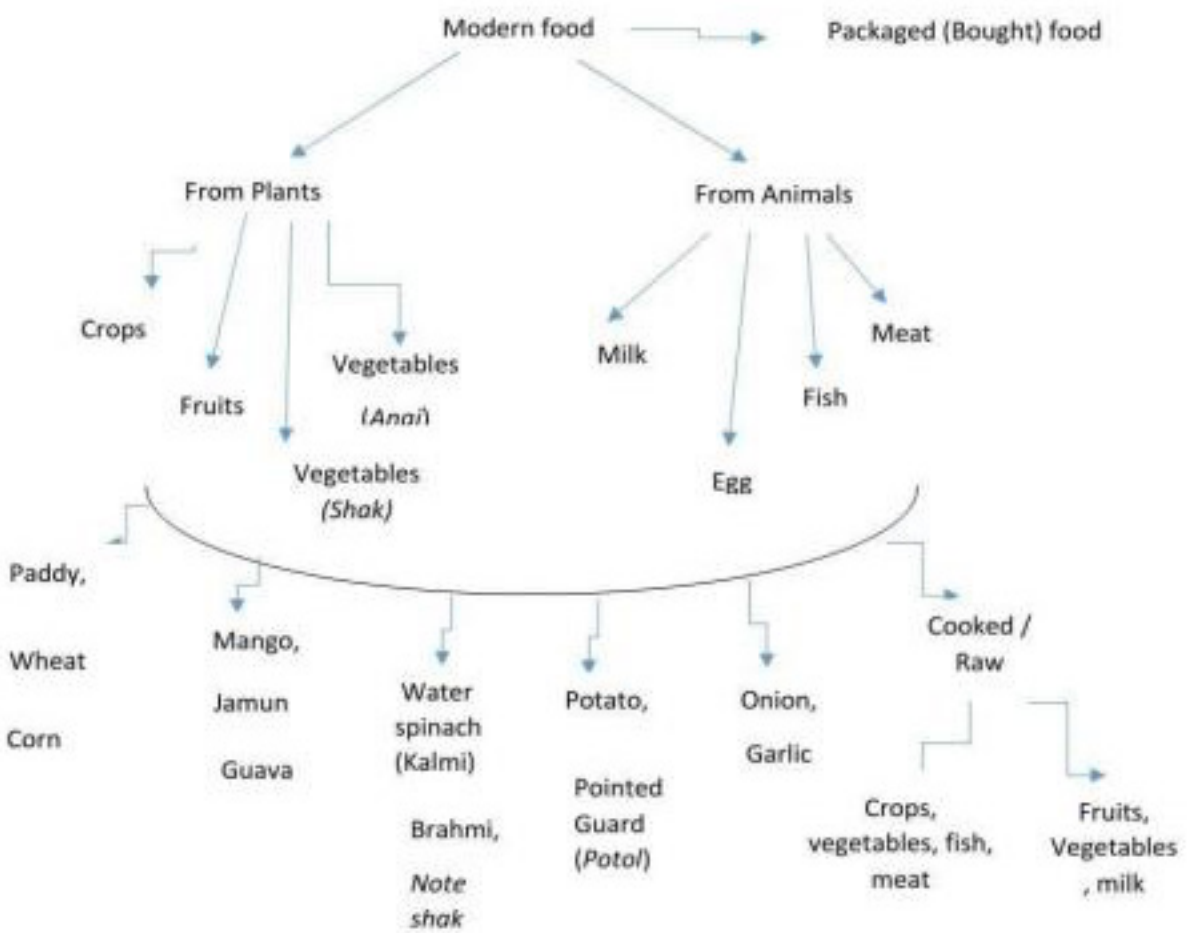
What you eat daily are they cooked? Do you make other food items in your house? Do you eat the same thing cooked in at home when you visit anywhere?

Do you think readymade food items are better than homemade food items?

e. Evaluation:

Which one is better fire from coal or microwave according to you? And why?

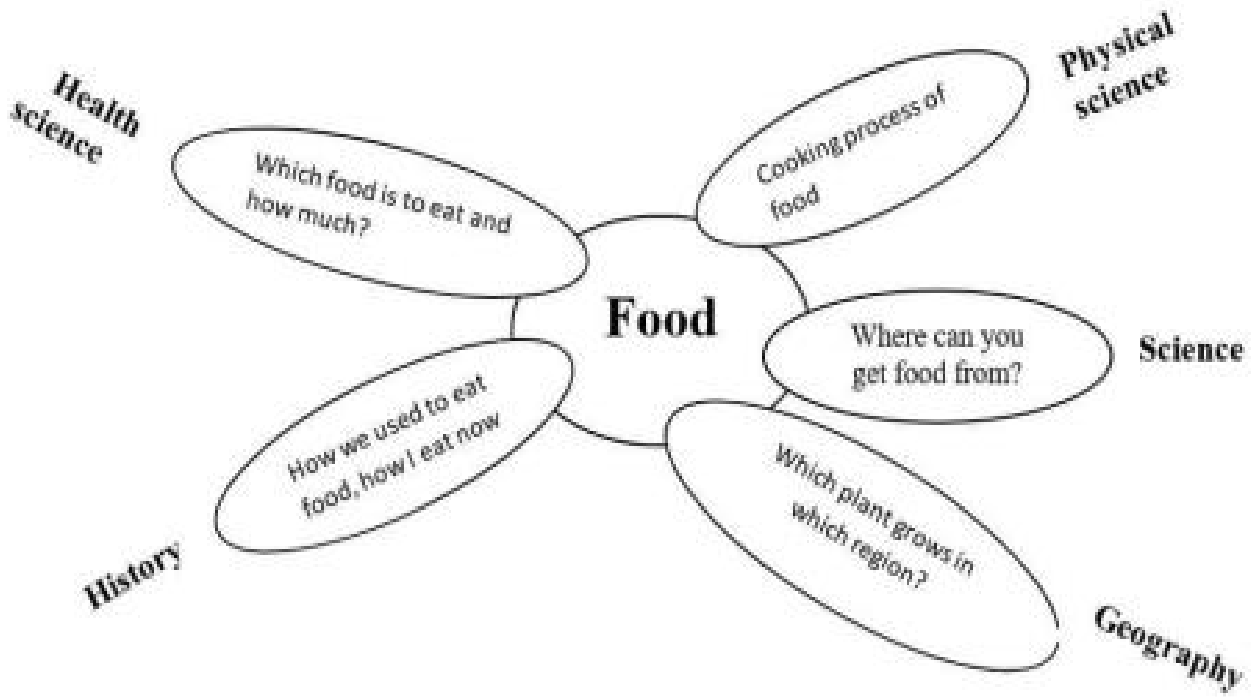
8.4.4. Concept Map



8.4.5. Concept of integrated teaching Learning:

Integrated learning – teaching is used to represent all the related things of outer world in conventional continuous subject matters to the learners as if they are involved with them. As a result a healthy bonding is developed between many skills and knowledge. Learners get different inspiration from different sources. While a teacher is teaching a broad concept, there is need to establish integration between specific ideas related to each other. When teacher will set an example s\he should mind all types of learners and in case of having physical and mental difficulty of learners that should be guided to overcome.

A model of Integrated Learning



Besides different teaching supporting materials for example PPT and other real things which we can touch to know may help to build concept to visually impaired students. There is requirement of putting example from various socio economic backgrounds.

8.4.6. Project:

Students will be asked to investigate based on the problem taken from their surroundings. Students from class –III will be divided into small groups and will be asked to identify the crops, fruits, animal foods and plant food items from their daily diet chart. Then small groups will discuss who eat how much food from animals and plants as per their diet chart.

9.1. Annual Plan

9.1.1. Class- VIII

Subject: Environment and Science

Unit	Sub unit	Content	Period
1. Force and pressure (7 periods)	1. Unit of measurement of force	• Newton, springtula machine, and its working	1
	2. Friction and its measurement	• Explanation of friction and value of frictional force, friction in static state	1
	3. Fluid friction and pressure	• Measurement and explanation of density, demonstration with a dilution of oil and water, explanation of volume of the pressure of liquid depends on which things (depth, density etc.), direction of the pressure of liquid.	2
	4. Air Pressure	• Experiment of Torricelli	1
	5. Floatation , Buoyancy and Archimedes' Principle	• Explanation of Floatation, buoyancy, and principles of Archimides, nails do not float on water but steel bowl floats why? Will be explained	2
2. Force without touch (5 periods)	1. Gravitation and gravitational force	• Gravity, gravitational force and Newton's law of Gravitation	2
	2. Motion due to gravity and gravitational force	• Gravitational waves, free falling of object	1
	3. Concept of Static electricity and Charge	• Current involving friction, what type of current is produced in which object by friction (list)	1
	4. Speed as the impact of electricity	• Law of Coulombo • Conduction between nucleus and electron	1
3. Heat (8 Periods)	1. Quantity and unit of heat	• Heat, temperature, calories, relative heat and their mathematical calculation	1 2
	2. Change of state and latent heat	• Melting point, freezing point, solidification, change of state, evaporation, boiling, condensation	2 3
	3. Transfer of heat	• Conduction, convection, and radiation, thermoflask	

Unit	Sub unit	Content	Period
4. Light (5 periods)	1. Reflection	• Real, virtual reflection, Periscope, Reflection,	2
	2. Refraction and its formula	• Laws and formulas of refraction, Daily phenomena, Total internalreflection	3
5. Nature of substance (10 Periods)	1. Physical and chemical properties of matter	• Sensibility, change of matter by application of heat, identification of matter by its physical and chemical properties	3
	2. Features of metals and non-metals	• Metals and non metals luster, hardness, ductility, thermal conductivity, comparison of sounds of metals and non metals, combustion of metallic and non metallic things in air, reaction with water, acid etc.	5
	3. Metals in human life and environment	• Their use in various physical activities in day to day life	2
6. Structure of substance (6 periods)	1. Concept of atom and molecule	• Dalton, Atomic Model, Rutherford	2
	2. Different states of matter	• Solid, liquid, gas	1
	3. Valence and chemical bonding	• Ionic compounds, radicals, covalent compounds, parentheses	3
7. Chemical reaction (8 Periods)	1. Solvent	• Heat, light, pressure, solvent, electricity	1
	2. Catalyst	• Properties of catalyst, organic catalyst	1
	3. Endothermic and exothermic reactions	• Thermal reactions and practical applications, precautions, precautions of Endothermic reactions and changes	2
	4. Concept of oxidation and Reduction	• Oxidation examples and reactions, rust, corrosion and reagents , galvanization	2
8. Chemical effect of electric (4 periods)		• Electrolysis & Electroplating	4
9. Introduction to some gases (8 periods)	1. Apparatus used in laboratory	• Thermometers, electric cones, switches, bulbs, cotton swabs, burners, spirit lamps, glass bottles, beakers, pipettes, burettes, etc.	2 6
	2. Oxygen and Hydrogen	• Properties of oxygen, preparation of oxygen gas, properties of hydrogen, preparation of hydrogen gas	

Unit	Sub unit	Content	Period
10. Compounds containing carbon and their location in nature and in the living world	1. Compounds containing carbon and their location	● Carbon as compounds, carbon cycle	2
	2. Polymorphism	● Composition and properties of graphite and bir, charcoal adsorption	2
	3. Fuel price/Heating price	● Distinction between regular and irregular forms, fluorine heating value,	2
	4. Carbon-dioxide	● Energy conservation, alternative fuels	2
	5. Greenhouse effect	● Propertiesof carbon-dioxide, its usage and preparation	2
			1
		● Biomass, Greenhouse Gas,	
	6. Carbon-based polymers and their uses	● Polymers, synthetic polymers, degradable andNon-degradable	1
11. Natural Incident and their Analysis (5 periods)	1. Lightening	● Electric charges and ions, electric current, voltage difference, lightning stormy clouds, lightning protection	3
	2. Epidemic	● Infectious diseases, malaria, dengue, plague, diarrhoea hepatitis, AIDS, influenza	2
12. Structure of organism (8 periods)	1. Formation steps	● Simple, compound, gas, electron microscope	1
	2. Microscope		1
	3. Cell diversity		1
	4. Functions of cells	● Nutrition, respiration, excretion etc.	1
	5. Cellular organisms		3
	6. Effect of natural environment on cells	● Changes in cell in cold, hot, environment	1
13. World of microorganisms (5 periods)	1. Diversity of microorganisms	● Concepts of microorganisms and diversity of microorganisms (bacteria, protozoa, fungi, algae, viruses)	2
	2. Interrelationship between microorganism and environment , role of microorganism in the environment	● Concepts of parasitism, saprophytism and symbiosis	1
		● Role of microorganisms in agriculture, industry and medicine	2
		● Diversity of microorganisms bacteria, protozoa, fungi, algae, viruses,	5

Unit	Sub unit	Content	Period
		• Interaction with environment (parasites, protozoa, phytozoa),	
		• Role of microorganisms in the environment (agriculture, industry, medicine)	
14. Human food and its production (10 periods)	1. Crop diversity and production	• Land preparation, crop classification, seed sowing, spreading fertilizers, weed control	4
	2. Cultivation of food crops	• Cultivation method, use of paddy, mango, tea	3
	3. Methods of cultivation of other food items of animals	• Bees, fish, poultry	3
15. Endocrinal glands and puberty		• Endocrine glands- pituitary, thyroid, pancreas, adrenals and glands Puberty and mental changes	4
16. Natural calamity and conservation (12 periods)	1. Forest	• Different types of forests, benefits of forests, food chain, structure of ideal forest, crisis of forest, biodiversity, forest conservation, phyto and zoo plankton, cells and different animals in the sea in pollution and the problems	3
	2. Undersea organism	• Desert and its people, oasis, desert flora and fauna, pollution in Arctic and Antarctic environment	2
	3. Biosphere of desert and polar regions	• Extinct, endangered etc. Red data Book, Ex-situ, In-situ conservation	4
	4. Conservation of wildlife	• Vulture, fishing cat, gangetic dolphin, one horned rhinocerors	1
	5. Some endangered animals and their conservation		
17. Some important trees of our surrounding (6 periods)	1. Some important trees of our environment	• Bamboo, *Kachuripana, Shawl, Sundari*	2
	2. Spices and plants	• Pepper, Cinnamon, Turmeric, cardamom, ginger	2
	3. Medicinal plants	• Garlic, Neem, Bell, Amalaki, Nayantara, Mint, Aloevera (Ghritakumari)	2

9.1.2. Unit – World of Microorganism:

Sub unit: Role of Micro Organism in Environment: Food Processing

Learning objectives:

1. Will be able to explain the role of micro organism in food processing
2. The role of Lactobacillus in converting milk into curd can be explained through experiment.
3. Explain the conditions for Lactobacillus to remain active.
4. Can explain the need to keep experimental group as well as controlled group in conducting this experiment.

(A) Engage

- How do you like to eat yogurt?
- How is yogurt made?
- What does it take to make yogurt?

(B) Explore

- Let see some magic.
- You will need a cup of milk, one cup of water, three droppers and two glass slides. And your teacher will give you "magic water".
- **How to do:**
- Clean both slides. Label the slides 1 and 2. Then place them side by side on the table. ● Place a drop of milk in the center of each slide with a dropper. Now put a drop of water in the milk of slide no. 1 with a dropper. Add a drop of that magic water with the dropper in the milk of slide no.2. Now mix the liquids well by shaking the two slides.
- After two minutes shake the two slides and see what happens.

(C) Explain

What you see, write in the table below: (Table No. 1)

Sl no.	Time	The liquid is thicker than before	Whether grainy materials are formed or not	Whether the liquid is transformed into thicker substance	Whether the liquid is transformed into
1.	Before mixing water / magic water in milk	Yes/ No	Yes/ No	Yes/ No	Yes/ No
2.	Before mixing water / magic water in milk	Yes/ No	Yes/ No	Yes/ No	Yes/ No
3.	After 2 minutes	Yes/ No	Yes/ No	Yes/ No	Yes/ No
4.	After 4 minutes	Yes/ No	Yes/ No	Yes/ No	Yes/ No
5.	After 6 minutes	Yes/ No	Yes/ No	Yes/ No	Yes/ No
6.	After 8 minutes	Yes/ No	Yes/ No	Yes/ No	Yes/ No

7.	After 10 minutes	Yes/ No	Yes/ No	Yes/ No	Yes/ No

Sl no.	Time	Whether the liquid is more thicker or not	Whether grainy materials are formed in the liquid or not	Whether the liquid is transformed into solid or not	The chick is formed from the liquid or not
1.	Before mixing water / magic water in milk				
2.	Before mixing water / magic water in milk				
3.	After 2 minutes				
4.	After 4 minutes				
5.	After 6 minutes				
6.	After 8 minutes				
7.	After 10 minutes				

D) Extend/ Elaborate

Well, can you say any other food which you can explain like that?

What is needed to make that food?

Do you think that all these elements are just good?

Can you tell us what these elements are used for?

Can you say, if you put curd in the fridge, it will freeze quickly or not?

Can you tell me the reason?

Preparatory assessment can be done in each stage.

Lesson plan

Class-VIII Subject-Environment and Science

Crisis and conservation of single environment

Subunit-Forest

Learning objectives:

(1) Can give an idea about forest.

(2) Explain what makes an ideal forest.

(3) Can give an idea of how forests play a role in various human benefits. (4) Explain how forests control climate.

(5) Can explain how physical factors relate to forest structure.

(6) Can explain the role of forest in water cycle and its regulation. (7) Can determine the relationship of forests with biodiversity.

(8) Can give an idea of the formation of food chain from the location of forest and wild animals.

(9) Can indicate the current crisis of forest land and the role of the society in its conservation.

Forest: A group of plants growing over a large area

Structure of ideal forest: Differentiation of forest layers: First layer (canopy), second layer (canopy touching layer) - tertiary canopy and shrub layer, fourth layer - upper layer and fifth layer - forest floor.

Teaching Aids	**Learning method**
Videos of Amazonian or *Sundarbans* wildlife.	The entire topic can be shown through PPT. the same all the stories of Amazon and *Sundarbans* will be told. By now the student will have an idea about natural forest. Then the students will be able to say the name of the local forest and its nature i.e. whether it is natural or man-made. From here he will get the idea of natural forest.

All the teacher will write teaching aids in the left column and teaching methodin the column on the right as per the pattern above.

Benefits of forest: Source of fuel, supply of wood for human needs, control of various life-giving medicines and control of water cycle, control of soil erosion and wildlife, oxygen, weather control and balance in water cycle, soil erosion and forest conservation

Different forests depending on climatic factors (sunlight, temperature, rainfall): coniferous forest (*pine*), deciduous forest (*teak, arjuna*), evergreen forest (*jamun, banyan*), thorny shrub (*babul, cactus*), grass forest (hogla, shan), badaban with breathing roots (*garan, genwa)* .

Different kind of animals live in different types of forests: Bear, Cheetah, Elephant, Bison, Deer, Peacock etc.

Animals and plants make food chain in forest. Biodiversity is the presence and variation of different plants and animals.

Forest crisis: Fire, forest destruction for human needs.

Role of society in forest conservation:

Teaching Aids:

Videos related to Amazon or *Sundarbans* wildlife.

Teaching Methodology:-

The entire subject can be shown through (PPT). At the same time, the story of Amazon and Sundarbans will be told. From here students will get an idea about natural forest. Then the students can say the name of the local forest and its nature i.e. whether it is natural or man-made. From here they will get the idea of natural forest.

Teaching aids:

Charts showing the structure of ideal forests

Teaching method:-

Students should try to find out benefits we can get from forests. Common topics such as fuel source, furniture making, O_2 supply, leaf products etc are expected to come in their knowledge and students will be able to say easily. If not, the teacher will give helpful clues to tell them. Then the teacher will explain about the weather and the water cycle and they are related to forest.

Teacher Aids:

Charts with tables of physical elements of weather, water cycle charts, water cycle animations.

Teaching method:

Students will explain weather and climate by understanding the content from weather and climate charts They will distinguish them. Students will explain the water cycle by watching the animation of the water cycle.

From here the teacher will give an idea of how plants regulate precipitation by absorbing or releasing water vapor. The teacher will also mention that if the CO_2 in the air increases, the water cycle will be destroyed in extreme heat.

Teaching aids:

Pine Forest, Evergreen, Deciduous, Thorn Forest Grass Forest, Mangrove Forest Pictures will be shown in PPT.

Teaching method:

Give an idea of why these are formed or how changing weather elements create these forests. The teacher will try to find out from the students what plants or animals can be in the forest from the previous video or from daily experience and present a chart containing the names and figures of such animals and plants.

From here students will try to arrange on the principle of 'who eats whom'. In this way students will try to construct the food chain and get an idea about the food chain.

From the examples of plants and animals mentioned above, the teacher will give the concept of biodiversity and verify it from the students.

Teaching Aids:

Image of forest fire, symbolic image of people cutting down trees

Different types of forest fire events (eg, forest fire in America in 1910 AD) should be presented in story form. The students should be given an opportunity to tell how the forest is being destroyed and what damage it may cause in the coming days by referring to incidents such as *bonvojon*, forest fire due to smoking etc. The explanation of how these can be stopped should be brought out from among the students. In this context, to explain the role of human society teachers will refer to the incident-Chipko Movement, Amrita Devi Bishanoi etc. By doing this, the students will try to take initiative to save the forest. Students should be encouraged to spread the message of forest conservation in their area.

9.1.3. Project:-What Germs Do:

Project is an inquiry into a phenomenon or problem in the real world around you, which interests you, or which is a problem for you. Finding out why that event or problem occurs, knowing how it happens, understanding what is our gain or loss as a result, and estimating what benefits we can get from that event or how the problem can be solved is a project.

You surely know that we suffer from various diseases at different times. And you also know that many of these diseases are caused by germs. Try to get to know one of the people working in this laboratory through a project.

Whether any of them are suffering from any disease now, or have suffered before, and if so, which germ has caused it?

What disease is s/he suffering from? If the disease is caused by a germ, whether the disease is from the person's home or office environment, can s/he or not, or can s/he have the disease due to any behavior or habit and if so, what do you think? What measures should be taken to prevent the spread of this disease?

You will prepare your project in these few steps-

(1) **Title of the project**: The title of the project shall give a conceptual name to the project.

(2) **Purpose of the project:** State why you are doing the project: that is, doing it because you enjoy something, or to solve a problem.

(3) **Materials for the project**: Write what materials you need to do the project: chart paper, pen,Pencils, colors, a question paper to ask someone something, an instrument to measure something etc.

(4) **Methodology of the project**: Write how you are doing the project. That is, are you trying to know something by doing an experiment, and if so, what are you doing. Or if you are trying to know something by asking someone a question, then tell what question you are asking.

(5) **Information:** Write what information you know from your examination or interrogation.

(6) **Conclusion:** Write what you conclude from the discussion of the facts, and

(7) **Future Action:** Tell what needs to be done in the future.

9.2 Summary

The things which we human beings eat and digest are called food. They can be taken based on the taste buds' acceptance in our tongue, for example salty, bitter, sour, chili, sweet etc. Human diets and those of other animals are not always the same. Good food refers to Fresh Food which provides nutrients to the body such as fresh fruits and vegetables. Foods which do not give any nutrient rather harm our body are bad food. Fresh vegetables for example papaya helps in digestion, carrot beat help to boost immunity, and pumpkin helps to stand then pumpkin helps to maintain good eyesight, banana flower helps to increase hemoglobin. Different fruits protect us from various diseases and we can overcome our weakness caused by diseases. So it keeps balance of water in our body.

We may take our food in many ways- collected from plants, from other animals, for example fish, chicken, egg, and milk. These help us to be in good health. Besides we get many packaged, cooked food from shops but some chemicals which help to keep the food intact are used in it, though that is harmful for our health.

We human beings could not prepare food primarily so primitive people would take raw flesh of hunted animals. Later on they learn to make fire and cook with that. The process of cooking has changed from the earlier to the later. Previously it was coal which would help to make fire, now it is to light the oven of LPG gas, not only that but there are electric heater, induction, and microwave also.

9.3. Unit End Exercise

1. Prepare a lesson plan on any topic from the english text book of class II.
2. Prepare a lesson plan on any topic from the bengali text book of class V.
3. Prepare a lesson plan on any topic from the environmental science text book of class VI.
4. Prepare a lesson plan on any topic from the mathematics text book of class VIII.
5. What is concept mapping? Select any topic of environmental science and make a concept map on the selected topic.
6. Discuss the steps of content analysis.

UNIT

10

Evaluation

10.1. Introduction

Evaluation is a systematic and international process of gathering and analysing data (quantitative and qualitative), to reform learning, decision-making and action. Evaluation is a continuous process, forms and integral part of the total system of education and intimately related to our educational objectives. It exercises a great influence on the pupil's study habit and the teachers' methods of instruction and thus helps not only to measure educational achievement but also to improve it. Test is a technique of evaluation. It may be called as a tool, a question, set of questions, an examination which use to measure a particular characteristic of an individual. It is something which provides information regarding individual's ability, knowledge, performance, and achievement.

10.2. Objectives

- Students' progress can be judged during teaching learning process.
- To preserve students' profile and their progress with the follow-up activities.
- To decide how diagnostic tests can be used in different subjects.
- To know what remedial measures should be taken.

10.3. Monitoring the Progress During and After Lesson

Test are of two types: Psychological and Educational.

- Diagnostic Test is an important educational Test.

- A Test designed to identify & investigate the difficulties, inadequate & gaps of pupils in specific curriculum areas with a view to helping them to overcome those difficulties through remedial instruction is called Diagnostic test.
- A Diagnostic test is a test designed to locate specific learning deficiencies in case of specific individuals at a specific stage of learning so that specific efforts could be made to overcome those deficiencies.
- The process of determining the causes of educational difficulties is known as educational diagnosis.

10.3.1. Methods to evaluate progress:

The characteristic features of diagnostic test during the evaluation of student's progress:

- Diagnostic test will be done just after formative test.
- Help teachers to identify what students know and can do in different domains to support their student's learning.
- Help the teachers in identifying the status of learner at the end of a particular lesson, unit or course.
- Help to examine and compare of an individual's profile against certain norms or criteria.
- Help to focus on individual's educational weakness or learning deficiency and identify the gaps.
- Help to pinpoint the specific types of error and under lying causes of the problem as well as the types of tests to be taken.

How to conduct diagnostic test:-

Who will organise the test - Teacher or Researcher.

Where - School, Home, Workplace.

On whom- Students.

Objectives- Identify student's weakness and particular strengths in specific areas.

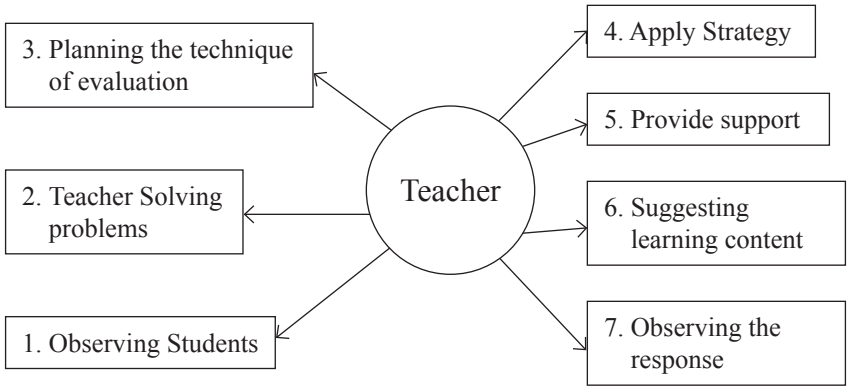
Techniques of Assessment-test/ observation/ interview.

Sequence- Follows reasonable steps.

- Remedial approach- Negotiable, Therapeutic.
- Is helped-Students, Parents, Teachers.

10.3.2. Step of diagnostic test:

Look-Plan-Act-Observe-Reflect



10.4. Follow up Activities- Maintenance of Student Profile, Reporting, Progress

Formative evaluation and diagnostic tests are applied to assess student's progress. Student progress should be continuously monitored by verifying its results.

This is known as follow up activity. It includes: -

(a) Data preservation of test results – Teacher made Test and Standardised Test.

(b) Anecdotal Record.

(c) Opinions of friends.

(d) Self-explanatory statement of students attitude, interest and personality measurement.

(e) Portfolio preparation.

(a) Data preservation of test results Teacher made testand Standardised Test: - Achievement Test is most important in school education. Teacher made test is more popular than the Standardised test.

Teacher Made Test: These types of tests are normally prepared and administered for testing classroom achievement of student, evaluating the method of teaching adopted by the teacher and other curricular programmes of the school. It is one of the most valuable instrument in the hands of the teacher to solve his purpose. It is designed to solve the problem or requirements of the class for which it is prepared.

Because tests provided with a text-book, don't include the knowledge the students gain from outside experiences, teacher made tests better reflect what is taught in class and fit better with the teaching methods they use. With customised tests Teacher can assess the students as they progress to check for understanding.

The test results can be used for students, teachers, and for other administrative purpose. Teachers can understand the need for re teaching and decide remedial instructions.

There is no scope to check the quality of the questions in case of Teacher made test, because the questions are not applied in the pre-examination phase. Although there are fixed rules in the application and evaluation of the test, it has no such reliability due to personal influence. The test results are only comparable in small cases. It is only because of the attachment to the teaching process that decision can be made about the quality of the results.

Standardised test: A standardised test is a test that is administered and scored in a consistent or standard manner. These tests are designed in such a way that the questions and interpretations are consistent and are administered and scored in apredetermined standard manner.

It is a method of assessment built on the principle of consistency. All test takers are required to answer the same questions and all answers are graded in the same, predetermined way.

These tests which are carefully constructed have uniformity of procedure in scoring, administering and interpreting the results. These tests are not restricted to use in a school or a few schools but to larger population.

Generally these tests are norm referenced tests that measure the students' level of achievement by comparing their test performance with the performance of other students in some general reference groups. Its validity and reliability can be determined by applying well defined statistical data. It can be determined whether the characteristic that the test is designed to measure is being measured and whether the result can be applied to different contexts.

These tests are very much impartial because of definite instruction, guideline and measurement procedure.

- The Standardised Test is based on the general content and objectives common to many schools all over the country. Whereas the Teachers Made Test scan be adapted to content and objectives specific to his own situation.
- The Standardised Tests deal with large segments of knowledge or skill.

Whereas the Teacher Made Tests can be prepared in relation to any specific limited tropic.

- The Standardised Test is developed with the help of writers, reviewers and editors of Tests items.

Whereas the Teacher Made Test usually relies upon the skill of one or two teachers.

- The Standardised Test provide Norms of various groups.
- Whereas the Teacher Made Test lack this point to reference.

But it can be said that the two tests are complementary to each other. Both types of tests are equally applicable to evaluate the success of the teaching learning procedure.

(b) Anecdotal record: Anecdotal record is a record of some significant item of conduct, a record of an episode in the life of students, a word picture of the student in action, a word snapshot at the moment of the incident, any narration of events in which may be significant about his personality. These are short, objective and as accurate as possible.

Daily observation of teachers helps to get detailed information about student learning and development. As for example, Shovona, teacher of class III at the primary level, noticed that Ramni in her class after mispronounced common words while reading, or Ratan stared blankly out of the window. Saurav always keeps asking many irrelevant questions. Again, Sudeep of class VII worked very slowly while doing various experiments in the Physical science period. On the other hand, Naveena finishes her work very quickly and help others also. Such incidents are very important to evaluate the progress and learning rate of the students. Students' behaviour in different situations is compared with the data obtained from other impersonal/objective method. Even if only this observation is capable of assessing a particular characteristic feature it remains prone to incomplete or biased judgement.

Anecdotal Record is the analysis of data. The information collected in this method is very much important for the parents as well the teachers.

It can be of two types: -

i. The name and characteristics of each student can be recorded on separate pages.

ii. Individual assessment can be recorded separately for particular skills of each student.

Different behavioural expression of skills acquired in learning process:

Skills	Speaking, writing, hearing, reading, drawing, playing the instrument, dancing, socializing.
Work habit	Planning skills, proper utilising of time, proper using of resources, enthusiasm, creativity, ability to stick.
Social attitude	Thinking about others, respecting laws and rules. Thinking of social development, respecting others.
Scientific attitude	Free spirit, sensitivity to causality, interest in practice of judiciousness.
Self-concept about education	Self -concept as a learner in subject such as reading ability, mathematics etc. Interest in solving new problems.
Interest	Interest in participating in education related various mechanical, scientific, aesthetic, social, recreational and vocational activities.
Appreciative	Appreciative attitude in nature, music, art, literature, sports and social field.
Adjustment	Relationship with friends, attitude towards praise or criticism, behaviour towards authority and balanced socialisation.

The uses of anecdotal records are limited to social adjustment. But its application is possible in various fields of teaching.eg:

Class-VI

Name of the school- Parul samanta

Date-25/8/2009

Place- Classroom

Incident: One day Parul told her Bengali teacher that she had written a story. The teacher asks her to read the story. Her hands were trembling a little while she was reading the story and she rubbed her feet frequently. Her voice was gradually getting lower.

Explanation: Parul enjoys writing something on her own. Although her compositions are very sensitive and reasonable. She is timid in nature.

She is not feeling free to express herself in front of many people. The behaviours that should be noted in the anecdotal records are: a)The behaviours that cannot measured with pen-paper test. b) Observing certain specific behaviours. c)Accurate assessment for student who need special achievement.

Advantages of Anecdotal Records:

- Provision of inside into total behavioural incidents.
- Needs no special training.
- Use of formative feedback.
- Economic and easy to develop.
- Can select behaviours or events of interest and ignore others, or can sample a wide range of behaviours.
- Collecting real data in natural environment.
- Particular important information can be recorded.
- It can be used for very young children or children who have speech disability.

Disadvantages

- If carelessly recorded, the purpose will not be fulfilled.
- Only records events of interest to the person doing the observing.
- Quality of the record depends on the memory of the person doing the observation.
- It is very time consuming.
- May not be impartial every time.

Guideline for making Anecdotal Records:

- Keep a notebook to make brief notes to remind incidents that to include in the record. Also include the name, time and setting in the notes.
- Write the record as soon as possible after the event.
- In anecdotal record identify the time, child, date and setting.
- Describe the action.
- Include the responses of other people if they relate to action.
- Describe the event in the sequence that it occurred
- Record should be completed.
- They should be compiled and filed.
- They should be emphasized as an educational resource.

- The teacher should have practiced and training in making observations and writing records.

C. Opinions of friends: In many cases the student is evaluated by assessing the opinion of friends on the same scale as/like the teachers. The average perception of a student can be assessed from the friends' opinion. A clear idea about the particular student can be assessed from the method. In this context two strategies are widely used:

(1) Who is he/she? – both negative and positive strategies may be used.eg:-

– Here in one is always friendly.

– Here is one who is never friendly.

– Say who is he /she?

Many teachers want to ask questions only on positive ideas. In many cases students are encouraged to say more than one name. The instructions given in such assessment are mentioned below: -

1. Name one or more student for each description given below: -
2. This name cannot be seen by anyone other than the student and the teacher.
3. One friend may have many qualities.

(a) There are some who like to work or play with others.

(b) There are some students who want to share different things with others.

(c) There are some students who help others to do class work.

(d) There are many students who don't want to exclude other friends from playing games.

(e) Many of the student encourage others for studying better. Their scores indicate how popular they are among friends. Friends' opinions about them are also known. This method helps to collect permanent and detailed feedback about the student. The main advantage of this method is that it is very simple and can be applied at all levels in any situation.

Sociometric Techniques/method: The social acceptability of any person can be measured with the help of this technique. The important principles are:

(a) Any person must be genuinely liked.

(b) The choice must be reasonable. The person must be chosen with proper reason.

(c) The list of preferences should be of kept secret.

(d) Groups need to be rearranged.

(e) The rank of each student can be determined by the number of their acceptability.

(f) The information of disliking for a particular student is very important for giving feedback/ necessary support/assistance.

A form for sociometric survey is given below:

Name:

Date:

Instruction:

- Over the next few weeks, you will change your sitting arrangement after that few small groups will be made.
- We will play some games.
- The groups will be made by yourself as you know everybody by name.
- Who wants tosit beside whom or want to form a small group should write on a paper.
- No one but you and the teacher will know it.
- You have to select five friends for each question.

Things to remember:

- The name of your friends must be selected within your own class including absentees

Selection:

(1) I want to sit beside them

1 4

2 5

3

(2) I want to do class work with them

1 4

2 5

3

(3) I want to play with them

1 4

2 5

3

In this way, students who are liked by their friends can be identified from everyone's opinions. Disliked students can be identified also. In this way when these types of lists are represented by graph, it is called as **sociogram**. It is a graphic representation of sociometric study. The most preferred students are situated at the centre of the sociogram.

Uses of sociometric technique:

- It enables teachers and parents to know the structure of social relationship amongst the small group of the students.
- It states the friendship pattern among the student's group.
- It gives clear picture regarding the line of attraction and rejection.
- Enables the teacher to study the student's choice through which the quality of social relationships among the students can be determined.
- It helps the teacher to identify which students are most liked by others.

- Help the teacher to identify which students feel isolated and need assistance.
- It is a method of data collection and observation which is natural, simple and economical.

(d) Technique of self-explanatory statement: It is the most convenient and important way to collect information from students. The main method for this purpose is the 'Face to face' interview.eg.

- Date can be collected.
- The psychological /mental status of the interviewer can be observed.
- Now a-days the questionnaire method is the most popular method for self - explanatory statement.

The main disadvantages:

- The students may withhold their actual information.
- Biased self-perception/conception can influence the data.
- The data are disclosed anonymously to the students.

There are three types of self-explanatory technique: -

(1) **Attitude measurement:** Attitude measurement and attitude formation are two important components of self-explanatory technique. In some case these are considered as by -products of the teaching-learning process.eg. Attitude towards text books, learning experiences, library, laboratory etc. Attitude should be measured on specific data rather than just observation.eg. Attitude towards Mathematics for class III:

What we do	Best	Average	Don't like
Counting of numbers			
Addition			
Subtraction			
Solving problems			
Numerical series			
Shapes			
to calculate			
Time			
To change			

Likert scale: It is a psychometric scale named after its inventor. It is commonly used in research questionnaire. The 5-point Likert scale is a global scale that is used to assess attitudes and views. As for

example -Strongly agree, Agree, Neither - agree, Nor - disagree (Undecided), Disagree, Fully disagree.

How to design Likert scale:

- Develop a clear understanding of what you want to measure.
- Design easy to understand items.
- Decide on the number of items needed to measure each construct.
- Create a balance scale.
- Inclusion of a midpoint.
- Label each anchor point on Likert scale.
- Number of point on a scale.
- The options on each end are called response anchors.
- The midpoint is after a neutral item, with positive options on one side and negative options on the other. Each item is given a score from 1 to 5.

Example:-

Scale of Attitude towards science study.

SA-Strongly Agree, A-Agree, U-Undecided, D-Disagree, SD- Strongly Disagree.

a) The Science lessons are very interesting	SA	A	U	D	SD
b) The Science laboratory is very old					
c) Science games are funny					
d) Class works are good					
e) Reading text books is wastage of time					
f) Laboratory experience create great interest					
g) The problems being solved are not absolutely important					
h) I am not at all interested about science					

(2) **Interest measurement:** Interest measurement techniques are also self-explanatory like attitudinal measurement. Here interest is measured on the bases of likes and dislikes. Measurement of interest is:

1. Adventure

2. About animals

3. About industry

4. Biography and

5. Detective stories etc.

Interest can also be measured in various ways.eg by custom ramming etc. In this way student preferences can be identified. There is no difference between righty/wrong/knowing/unknowing.

Standardised tests are more popular for measuring interest in choosing profession than in classroom.

(3) Personality measurement : Anecdotal Records are the best method for assessing and measuring the personal characteristics of students in the classroom or for collecting date on compliance. It includes student self-explanation as well as peer evaluations, teacher and parent evaluations. However, it is desirable for the teacher to be familiar with other methods.

Limitation of self-explanatory techniques do not lie in personality measurement. Personality measurement scores obtained through questionnaires/interviews that are especially used in guidance and counselling.

In addition to this 'question and answer' technique, the 'projective' technique has been used for a long time as a technique to identify specific mental disorders and maladjustment. Mental structure is decided from unstructured images. Its two main Methods are Rosa-inkblot test and thematic apperception test (TAT). Rosa ink blot test consists of ink-stamped cards and TAT test consists of many sets of pictures. Tests are applied one by one. The process is documented. Through its proper analysis and interpretation, a complete picture of a student's/ person's personality is obtained. These tests are usually used for curative procedures.

(e) Portfolio preparation: Portfolios can be prepared and used in different ways. The main difference between a student's portfolio and its work file is that the objectives of the work in the portfolio is very clear. The information become significant only if the purpose is clear. The evaluation method is also determined according to the nature of data stored.

The two main objectives of using portfolios in the classroom are instruction and assessment. The use of portfolios is different in formative and summative assessment/evaluation. Portfolio is primarily used as an instructional technique in organisational assessment. In this case, the student's self-evaluation ability is developed through the portfolio. Ability to evaluate own work is one of the main objectives of education. This requires special practice and feedback. A well-organised portfolio not only identifies the student's own works, but also encourages student's own reflection and comments to help other to think about his/her works, thus the student's work and his/her own thought about the work in various subjects provide the teacher with information about the student's progress and self -evaluation abilities.

Aportfolio-based discussion between the teacher and the student about performance skills, criteria for excellence etc. can take place. Its relevance may come up in teacher-parent discussion meetings. portfolio content may include a variety of audio and visual information.

In case of summative evaluation mainly certificates/diplomas/degrees are given. In many cases

these are based on the portfolio. If grades or marks are given to the student based on this, it should be specified in advance how much importance will be given to any subject. In that case the scoring system needs to be error free as much as possible. Apart from this, a few other categories of portfolio are: -

(a) Successive recognition and sign of progress.

(b) Showing and Documenting.

(c) Complete identifying portfolios, job candidate's portfolios to see how day-to day operations are being conducted and how improvements can be made.

Portfolio preparation: Portfolios can be prepared and can be used in different ways. The main difference between a student's portfolio and his work file is that the objectives of the work in the portfolio are very clear. The collected information become significant only when the purpose is clear. The method of evaluation is also determined according to nature of the collected data.

Two main objectives of using portfolio in the classroom are instructions and evaluation. The uses of portfolio are different in formative and summative evaluation. In formative evaluation portfolio mainly used as an instructional technique. In this case, student's self -evaluation skill is developed through the portfolio. It is considered as one of the main objectives of education. Special practice and feedback are necessary for that. A well-organized portfolio not only identifies the student's selected works but also encourages student's own thoughts can help others to think about his works. In this way students' activities and his own reflection about his work provide teachers with information about the progress and self-evaluation skill of the student.

Discussion about performance, skills, excellence etc. between teacher and student is very much portfolio - centric. It is very relevant agenda for parents- teacher meeting Audio visual information can be included in it. In many cases the certificates/degree/diplomas of summative evaluation is awarded based on the portfolio. In this case, it should be specified in advance how much importance will be given to any subject. In that case the scoring system should be error free as much as possible. A few other categories of portfolio are:

- Successive recognition and continuity in recognition.
- Showing and documenting the data
- Job candidate portfolio, functional portfolio, regular portfolio can be made to track the improvements.

Portfolio preparation- when the portfolio will be applied for evaluation the following points should be known: 1) When and where the portfolio will be used. 2) Who can access the information. 3) What type of information will be provided. 4) What will be the parameters of the evaluation. 5) How long will data be recorded. 6) Which medium should be associated with it other than paper and pen. 7) Which elements are used in structure formation ie. contents, page numbers etc. Constructing subject-wise portfolios in primary schools: -

Subject: Mathematics(according to Paulson,1994)

Different medium: Presentation of information through pictures & drawings.

Use of technology: Disclosure and declaration of information with the help of computers and calculators.

Problem solving through group work: Teacher observations, dialogue between students and disclosure of documents related to personal contributions of the group members.

Use of real life examples.

Interdisciplinary presentation: Integration of Mathematics to other subjects.

Publication of student's personal activities.

Portfolio Evaluation Methodology: The primary condition of portfolio evaluation is to express the aims and objectives of the educational instruction.

Teachers, parents as well as students should have a clear conception about it.

The differences from general evaluation are:

(1) Portfolios contain many samples of student's activities. It is not done within a definite time limit and samples.

(2) Diversified experiences are recorded here which is different from general evaluation.

(3) Student's mindset, attitude etc. are expressed along with various activities performed by the students.

During evaluation different method are used for scoring. It is done basically with the help of chart or rating scale.

For example, the grading of a portfolio in Mathematics is given below:

Developing mathematical understanding	Not Satisfactory Very Advance 1 2 3 4 5
Progress in solving a numerical set from beginning to end	
Improving problem inventing and their skill to solve them	
Ability to make connections between different problems	
Improving the ability to communicate with others about mathematical solution	
Ability to develop and apply rational solutions	
Improvement of skills in using various diagrams and charts	

Student's progress can be evaluated through the above-mentioned method. A comprehensive profile of the student can be seen here, as each attribute has a specific rating. An overall outline is available at the end of the year as ratings are taken from different parts of the curriculum at different times of the year.

10.5. Diagnosis and Diagnostic Test in L-1, L-2, Mathematics and Environment Science

10.5.1. Diagnostic Test:

It is a type of achievement test. This is specific test. It does not give importance to the overall score. Diagnostic tests are used to find out where and what kind of difficulties the students have. There is no fixed time limit for this test. Students can solve the problems as long as they need. A diagnostic test is applied to the students with below average subjective abilities. Its main objective is to identify the weakness of the students and take remedial measures for them.

10.5.2. Diagnostic tests for different subjects

The number of questions for subject-wise diagnostic tests are many because student's weakness should be diagnosed precisely. Different types of diagnostic tests are available.

10.5.2.a. Diagnostic test for Language- L-1,L-2:

The questions of language - based diagnostic tests are composed of spelling, vocabulary, syntax, grammar, opposite words etc.

As for example: -

(1) Testing for weakness in spelling: I _ _N, _ E, _ _ _CK, M _ _R,

(2) Testing for weakness in vocabulary: Bitter = _____, Naughty= _____, Favourite=_____.

10.5.2.b. Diagnostic test for Mathematics: -

In mathematical diagnostic tests generally given question are based on fundamental processes. In arithmetic tests four fundamental processes (Addition, Subtraction, Multiplication, Division) are analysed separately.

In order to do addition properly students should know tables. Addition of any numbers with zero, should be known properly. By analysing in this way each attribute measurement problem is selected. To identify the area of weakness in mathematics questions are composed of decimal, addition, subtraction, fraction, mathematical vocabulary etc.

5-2=?	1-1=?	0-0=?
7-5=?	3-3=?	5-0=?
9-3=?	7-7=?	8-0=?
2+2=?	0+0=?	4+4=?
3+0=?	1+8=?	1+5=?
7+1=?	3+2=?	1+4=?

In primary education, questions of diagnostic tests for identifying the weakness in environmental science, are composed of fundamental knowledge. The basic fundamental knowledge in environmental science is to know the structure and function of the different organs of the student's own body. This requires the knowledge of sense organs.

Following questions can be composed to determine the weakness, eg.

(1) Your mother is sitting near you, and you are lying with your eyes closed. How do you recognise anybody's entrance in the room?

(2) Identify the human sense organs in this picture. Students will verbalise the function of each sense organ.

10.6. Remedial Measures

Corrective action is to taken in diagnostic tests, if necessary. Teacher's awareness about the backward students will be easier.

Remedial actions -resolve the problem using the following approaches:

(1) Conducting oral discussion.

(2) Giving simple examples for different subjects.

(3) Concrete experiences are given.ie, the student is given life centric examples.eg. conception of addition is given by using the real objects.

(4) LTM can be used.

(5) Students have to play an active role.

(6) Students have to be given motivation by using real examples and appropriate materials.

10.7. Summary

Different tools and techniques are used in education to evaluate student's progress. Evaluation is a technique by which achievement of the students can be assessed-during and after the teaching-learning process. The strength and weakness of the learners in the learning area will be recorded and that will help in their progress later on. If necessary, remedial measures are taken in different cases. The main aims and objectives of evaluation and diagnostic tests is to identify student's weakness in learning and to help their improvement and progress.

10.8. Unit End Exercise

1. Essay type question:

   Explain with examples why diagnostic tests is used to identify students' learning disabilities.

2. Short Questions

   - Why is it necessary to evaluate progress during lessons.
   - Write down the different types of evaluating techniques.
   - Why is it necessary to maintain student profile?
   - How to preserve progress report?