UNIVERSITY GRANTS COMMISSION

NET BUREAU

SYLLABUS

Subject: GENERAL PAPER ON TEACHING & RESEARCH APTITUDE **Code No.** : 00

PAPER-I

The main objective is to assess the teaching and research capabilities of the candidates. The test aims at assessing the teaching and research aptitude as well. Candidates are expected to possess and exhibit cognitive abilities, which include comprehension, analysis, evaluation, understanding the structure of arguments, deductive and inductive reasoning. The candidates are also expected to have a general awareness about teaching and learning processes in higher education system. Further, they should be aware of interaction between people, environment, natural resources and their impact on the quality of life.

The details of syllabi are as follows:

Unit-I **Teaching Aptitude**

- Teaching: Concept, Objectives, Levels of teaching (Memory, Understanding and Reflective), Characteristics and basic requirements.
- Learner's characteristics: Characteristics of adolescent and adult learners (Academic, Social, Emotional and Cognitive), Individual differences.
- Factors affecting teaching related to: Teacher, Learner, Support material, Instructional facilities, Learning environment and Institution.
- Methods of teaching in Institutions of higher learning: Teacher centred vs. Learner centred methods; Off-line vs. On-line methods (Swayam, Swayamprabha, MOOCs etc.).

- Teaching Support System: Traditional, Modern and ICT based.
- Evaluation Systems: Elements and Types of evaluation, Evaluation in Choice Based Credit System in Higher education, Computer based testing, Innovations in evaluation systems.

Unit-II **Research Aptitude**

- Research: Meaning, Types, and Characteristics, Positivism and Post-positivistic approach to research.
- Methods of Research: Experimental, Descriptive, Historical, Qualitative and Quantitative methods.
- Steps of Research.
- Thesis and Article writing: Format and styles of referencing.
- Application of ICT in research.
- Research ethics.

Unit-III **Comprehension**

- A passage of text be given. Questions be asked from the passage to be answered.

Unit-IV **Communication**

- Communication: Meaning, types and characteristics of communication.
- Effective communication: Verbal and Non-verbal, Inter-Cultural and group communications, Classroom communication.
- Barriers to effective communication.
- Mass-Media and Society.

Unit-V **Mathematical Reasoning and Aptitude**

- Types of reasoning.
- Number series, Letter series, Codes and Relationships.
- Mathematical Aptitude (Fraction, Time & Distance, Ratio, Proportion and Percentage, Profit and Loss, Interest and Discounting, Averages etc.).

Unit-VI Logical Reasoning

- Understanding the structure of arguments: argument forms, structure of categorical propositions, Mood and Figure, Formal and Informal fallacies, Uses of language, Connotations and denotations of terms, Classical square of opposition.
- Evaluating and distinguishing deductive and inductive reasoning.
- Analogies.
- Venn diagram: Simple and multiple use for establishing validity of arguments.
- Indian Logic: Means of knowledge.
- Pramanas: Pratyaksha (Perception), Anumana (Inference), Upamana (Comparison), Shabda (Verbal testimony), Arthapatti (Implication) and Anupalabddhi (Non-apprehension).
- Structure and kinds of Anumana (inference), Vyapti (invariable relation), Hetvabhasas (fallacies of inference).

Unit-VII Data Interpretation

- Sources, acquisition and classification of Data.
- Quantitative and Qualitative Data.
- Graphical representation (Bar-chart, Histograms, Pie-chart, Table-chart and Line-chart) and mapping of Data.
- Data Interpretation.
- Data and Governance.

Unit-VIII Information and Communication Technology (ICT)

- ICT: General abbreviations and terminology.
- Basics of Internet, Intranet, E-mail, Audio and Video-conferencing.
- Digital initiatives in higher education.
- ICT and Governance.

Unit-IX **People, Development and Environment**

- Development and environment: Millennium development and Sustainable development goals.
- Human and environment interaction: Anthropogenic activities and their impacts on environment.
- Environmental issues: Local, Regional and Global; Air pollution, Water pollution, Soil pollution, Noise pollution, Waste (solid, liquid, biomedical, hazardous, electronic), Climate change and its Socio-Economic and Political dimensions.
- Impacts of pollutants on human health.
- Natural and energy resources: Solar, Wind, Soil, Hydro, Geothermal, Biomass, Nuclear and Forests.
- Natural hazards and disasters: Mitigation strategies.
- Environmental Protection Act (1986), National Action Plan on Climate Change, International agreements/efforts -Montreal Protocol, Rio Summit, Convention on Biodiversity, Kyoto Protocol, Paris Agreement, International Solar Alliance.

Unit-X **Higher Education System**

- Institutions of higher learning and education in ancient India.
- Evolution of higher learning and research in Post Independence India.
- Oriental, Conventional and Non-conventional learning programmes in India.
- Professional, Technical and Skill Based education.
- Value education and environmental education.
- Policies, Governance, and Administration.

NOTE:

(i) Five questions each carrying 2 marks are to be set from each Module.

(ii) Whenever graphical/pictorial question(s) are set for sighted candidates, a passage followed by equal number of questions and weightage be set for visually impaired candidates.

SYLLABUS

Sub Unit – 1: Teaching: Nature, Objectives, Characteristics and Basic Requirements

SL. NO	TOPICS
1	1. Introduction
2	2. Concept of Teaching
3	3. Objectives of Teaching
4	4. Levels of Teaching (Memory, Understanding and Reflective)
5	4.1. Memory Level of Teaching
6	4.2. Understanding Level
7	4.3. Reflective Level of Teaching
8	5. Characteristics of Teaching
9	6. Basic Requirements of Teaching
10	7. Steps of Teaching
11	8. Types of Teaching Models
12	8.1.Advanced Organizer Model (Ausubel's Model)
13	8.2.Inquiry Training Model (Schumann's Model)
14	8.3.Mastery Learning Model (Bloom's Model)

Sub Unit – 2: Learner's Characteristics

SL. NO	TOPICS
15	9. Concept of Learning
16	10. Characteristics of Adolescent and Adult Learners
17	10.1. Academic
18	10.2. Social
19	10.3. Emotional
20	10.4. Cognitive
21	11. Individual Differences
22	12. Relationship of Teaching and Learning

Sub Unit – 3: Factors Affecting Teaching

SL. NO	TOPICS
23	13. Teacher
24	13.1. Special Characters of a Good Teacher
25	14. Learner
26	15. Support Materials [Visual and Audio Visual]
27	16. Instructional Facilities
28	16.1. Teaching Aids
29	16.2. Importance of Teaching Aids
30	17. Learning Environment and Institution
31	17.1. Effectiveness of Teaching-Learning Process

Sub Unit – 4: Methods of Teaching in Institutions of Higher Learning

SL. NO	TOPICS
32	18. Concept of Teaching Methods
33	19. Teacher Centred vs. Learner Centred Methods
34	20. Off-Line vs. On-Line Methods
35	20.1. Blended Learning
36	21. Meaning of Teaching Strategy
37	22. Meaning of Teaching Tactics
38	23. Some Important Methods of Teaching
39	23.1. Lecture Method
40	23.2. Lessons Demonstration Method
41	23.3. Programmed Instruction Method
42	23.4. Project Teaching Method
43	23.5. Group Discussion Method
44	23.6. Brain Storming
45	23.7. Laboratory Method
46	24. Some Specific Methods of Teaching
47	24.1. Team Teaching
48	24.2. Micro Teaching
49	24.3. Dynamic Teaching

Sub Unit – 5: Teaching Support System

SL. NO	TOPICS
50	25. Traditional System
51	26. Modern System
52	27. ICT Based System

Sub Unit – 6: Evaluation System

SL. NO	TOPICS
53	28. Concept of Evaluation
54	29. Role / Function of Evaluation
55	30. Desirable Characteristics of Evaluation
56	31. Elements and Types of Evaluation
57	31.1. Formative Evaluation
58	31.2. Summative Evaluation
59	31.3. Process Evaluation
60	31.4. Outcome Evaluation
61	31.5. Economic Evaluation
62	31.6. Impact Evaluation
63	31.7. Goals-Based Evaluation
64	31.8. Diagnostic Evaluation
65	31.9. Achievement Test
66	31.10. Open Book Examination System
67	32. Evaluation in Choice Based Credit System (CBCS) in Higher Education
68	32.1. Types of Courses
69	32.2. Grading System
70	32.3. How does CBCS work?
71	32.4. Benefits of CBCS System
72	33. Computer Based Testing
73	33.1. Benefits of Computer-Based Testing
74	34. Innovations in Evaluation Systems
75	34.1. Invention, Bricolage and Translation
76	34.2. Worthwhile Innovation
77	34.3. Supporting Innovation

Section – 1: At a Glance

Sub Unit – 1: Teaching: Nature, Objectives, Characteristics and Basic Requirements

CONCEPT OF TEACHING: There are two concepts of teaching: traditional concept and modern concept.

Traditional concept: Teaching is the act of imparting instructions to the learners in the classroom situation.

Modern concept: Teaching is to cause the pupil to learn and acquire the desired knowledge, skills and also desirable ways of living in the society.

OBJECTIVES OF TEACHING: Some key objectives of teaching are: Learner's all round development, Change of learners' behaviour, Development of adjustment power of learners, Progression of learner's mental ability, Transmission of knowledge, Assimilation of lessons, Friendly environment.

CHARACTERISTICS OF TEACHING:A desire to share your love of the subject with students, an ability to make the material being taught stimulating and interesting, facilities for engaging with students at their level of understanding, capacity to explain the material plainly, a commitment to encouraging independence, an ability to improvise and adapt to new demands, using teaching methods, focus on key concepts, giving the highest quality feedback on student work.

BASIC REQUIREMENTS OF TEACHING: Teaching process involves:

Dependent Variable: Students

Independent Variable: Teacher

Intervening or Medial Variables: Content of teaching, methods and techniques, tactics and strategies management of instructional material and teaching environments etc.

STEPS OF TEACHING: Decide how you want to teach, decide on mode of delivery, work in a team, build on existing resources, master the technology, set appropriate learning goals, design course structure and learning activities, communicate, communicate, and communicate, evaluate and innovate

TYPES OF TEACHING MODELS: Israel Shaffer's models: Impression Model, Insight Model, Rule Model. **John P Pecesces's models:** Basic Teaching Model, Computer Based Teaching Model, Teaching Model for School Learning, Interaction Model of Teaching

B. R. Joyce models: Social Interaction Model, Personal Source, Behaviours Modification Source.

Sub Unit – 2: Learner's Characteristics

CONCEPT OF LEARNING: Learning is a key process in human behaviour. It is defined as "any relatively permanent change in behaviour that occurs as a result of practice and experience". This definition has three important elements.(i) it is a change in behaviour – better or worse (ii) it is a change that takes place through practice or experience, but changes due to growth or maturation are not learning and (iii) this change in behaviour must be relatively permanent, and it must be a fairly long time.

CHARACTERISTICS OF ADOLESCENT AND ADULT LEARNERS:

Academic: Academic characteristics of learners include the education type, education level and knowledge.

Social: Adolescent social development is often described as the process of establishing a sense of identity and establishing a role and purpose.

Emotional: The way a person thinks and feels about themselves and others, their inward thoughts, is key to their emotional development.

Cognitive: Cognition is the process involving thought, rationale and perception. The physical changes of the brain that occur during adolescence follow typical patterns of cognitive development.

INDIVIDUAL DIFFERENCES: People are more different than they are alike, and there is probably no environment that elicits individual differences sooner in life than formal education. Individual differences in academically related characteristics can make for success or failure in one of life's most important pursuits – obtaining an education. As a result, a primary focus of applied educational psychologists has been the identification of methods that allow each individual to achieve their maximum educational performance.

RELATIONSHIP OF TEACHING AND LEARNING:A good teacher is like a candle, it consumes itself to light the way for others. It is an important part of the process of education. Its special function is to impart knowledge develop, understanding and skill. There is a close relationship between teaching and learning. A teacher is said to be teaching when he/she is helping someone else to learn.

A teacher and his students interact and communicate, generally, under three types of relationships: authoritarian, democratic and laissez-faire.

The teaching-learning process generally operates at three levels which include: memory level, understanding level and reflective level.

Sub Unit – 3: Factors Affecting Teaching

TEACHER: The teacher is an innovator of information and knowledge. He is the creator and transmitter of knowledge, values and ethos to our youngsters for latter's physical, mental, emotional and social development. In the process of teaching-learning, the teacher is the main vehicle, and he knows what is right and what is wrong in the society.

LEARNER: The learner is a dependent one and immature in knowledge. He has to cooperate in the teaching-learning process with the teacher and try to get as much information and knowledge as possible from him. He must follow the teacher for understanding and getting knowledge.

SUPPORT MATERIALS: The subject is the main concern in the whole endeavour of teaching-learning process. The topic is generally decided by the teacher but the learner can also contribute in deciding a topic, so that, a balanced and harmonious development takes place.

INSTRUCTIONAL FACILITIES: Instructional facilities are defined as classrooms, seminar rooms, instructional laboratories, computer laboratories, on-campus clinics, cybraries and other spaces used principally for the purpose of delivering formal instruction to our university

students. The issue of classroom and instructional facilities planning and utilization continues to be a contested discussion on our campus.

TEACHING AIDS: There are many types of effective teaching aids which activate all faculties: Projected visual aids: direct projection, indirect projection, reflected projection, projected visual aids, audio-aids, activity-aids.

LEARNING ENVIRONMENT AND INSTITUTION: Learning environment can refer to an educational approach, cultural context, or physical setting in which both teaching and learning occurs. The term is commonly used as a more definitive alternative to 'classroom', but it typically refers to the context of educational philosophy or knowledge experienced by the student and may also encompass a variety of learning cultures – its presiding ethos and characteristics, how individuals interact, governing structures, and philosophy.

Sub Unit – 4: Methods of Teaching in Institutions of Higher Learning

CONCEPT OF TEACHING METHODS: A teaching method comprises the principles and methods used by teachers to enable student learning. These strategies are determined partly on subject matter to be taught and partly by the nature of the learner.

TEACHER CENTRED VS. LEARNER CENTRED METHODS: Teachers are the main authority figure in the Teacher-Centred Approach to Learning and students are viewed as 'empty vessels' whose primary role is to passively receive information with an end goal of testing and assessment. It is the primary role of teachers to pass knowledge and information onto their students.

In Student-Centred Approach to Learning, while teachers are the authority figure in this model, teachers and students play an equally active role in the learning process. Student learning is measured through both formal and informal forms of assessment, including group projects, student portfolios, and class participation.

OFF-LINE Vs. ON-LINE METHODS: With offline learning, participants are required to travel to the training location, typically a lecture hall, college or classroom. On the other hand, with online learning the training can be conducted from practically anywhere in the world.

Online learning usually has a more flexible timescale. As a trainer, you can offer your support via email or through an online chat system. With offline learning, it is typically carried out between office hours and doesn't offer as much flexibility to the learner or the trainer.

TEACHING STRATEGY: Teaching strategies refer to methods used to help students learn the desired course contents and be able to develop achievable goals in the future.

TEACHING TACTICS: Teaching tactics encourage active learning. Students should be routinely called upon to summarize or put into their own words what the teacher or another student has said.

LECTURE METHOD: Lecture method of teaching is one way channel of communication of information. Students' involvement in this teaching method is just to listen and sometimes pen down some notes if necessary during the lecture, combine the information and organized it.

LESSONS DEMONSTRATION: In demonstration method, the teaching-learning process is carried in a systematic way. Demonstration often occurs when students have a hard time connecting theories to actual practice or when students are unable to understand applications of theories.

PROGRAMMED INSTRUCTION: In programme instruction method, the responses of the learner are strictly controlled by the programmer. Its main focus is to bring desirable change in the cognitive domain of the learner's behaviour.

PROJECT TEACHING METHOD: Project method of teaching has evolved from the philosophy of programmatic. It is experience-centred strategy related to life-situation.

Kilpatrick has classified the project method in four types: constructive, artistic, problem-solving, group-work.

GROUP DISCUSSION METHOD: Group discussion is a child centred strategy, in which students are divided into groups and they are encouraged to discuss on the subject matter given. Group discussion is dominated by the teacher. This teaching strategy is focused to achieve higher order of cognitive objectives and affecting objectives.

BRAIN STORMING: In context to teaching, brainstorming is a strategy or tool of teaching used by the teacher in which maximum or all the students participate by responding or presenting views on one topic. This technique encourages new ideas among students which would never have happened under normal circumstances.

LABORATORY METHOD: Under this method, teacher encourages the students to derive various scientific laws and principles on their own by getting personally involved in the experiment work. This teaching method encourages maximum senses of students.

TEAM TEACHING: Team teaching is also called co-operative teaching. This is a recent idea in the field of education. The basic features of team teaching are: the subject teachers give lectures to a big class, all the members of the team have a common assembly, they discuss the methods used by the follow-teachers, and it has the potential to develop the habit of supplementing the teaching of each other.

MICRO TEACHING: Micro-teaching is an innovative teaching technique. It is a new development in the field of teaching. The key features of micro teaching are: it focuses on developing teaching skills, it is a highly individualized training skill, it provides feedback for trainee's performance, it is most effective for the student-teacher after the practice teaching.

DYNAMIC TEACHING: The best way to learn is to get actively involved in the activities. Learning should not be passive. The key features of dynamic teaching are: increase pupils' participation and interaction via collaborative activities. In the course of group activities, pupils feel more supported in their learning, several strategies can be envisaged depending on the objectives to be achieved.

Sub Unit – 5: Teaching Support System

TRADITIONAL SYSTEM: In the traditional teaching method, teachers illustrate the concept to the students with the help of chalks and blackboard. Every important thing regarding the topic is written on the blackboard and students make important notes from the blackboard. After the lecture is over students revise their notes and try to memorise the notes. The main objective of traditional teaching is to pass the examination.

MODERN SYSTEM: From the last decade the use of high-tech equipment in the educational institutions is increased with a rapid rate. Now there are lots of modern gadgets which can be used for improving the teaching in the classroom.

ICT BASED SYSTEM: Information and Communication Technology (ICT) in education is the mode of education that uses information and communications technology to support, enhance, and optimise the delivery of information.

Sub Unit – 6: Evaluation System

CONCEPT OF EVALUATION: The evaluation process ascertains the workability of learning experiences and change of behaviour of the students.
FUNCTION OF EVALUATION: Three main functions of evaluation: (i) it helps to build an educational programme, assess its achievements and improve upon its effectiveness, (ii) it plays an enormous role in the teaching-learning process, (iii) it helps teachers and learners to improve teaching and learning and (iv) it is a continuous process and a periodic exercise.

CONTINUOUS AND COMPREHENSIVE EVALUATION (CCE):
Comprehensive: It must try to assess all aspects of a child's development.
Continuous: Evaluation is a continuous process as education. It is not just an examination but a part of the evaluation process.
FORMATIVE EVALUATION: It is used before programme design or implementation. It generates data on the need for the programme and develops the baseline for subsequent monitoring. It also identifies areas of improvement and can give insights on what the programme's priorities should be.
SUMMATIVE EVALUATION: It is conducted after the programme's completion or at the end of a programme cycle. It generates data about how well the project delivered benefits to the target population.
PROCESS EVALUATION: It occurs once programme implementation has begun, and it measures how effective your programme's procedures are. The data is useful in identifying inefficiencies and streamlining processes, and portrays the programme's status to external parties.
OUTCOME EVALUATION: It is conventionally used during programme implementation. It generates data on the programme's outcomes and to what degree those outcomes are attributable to the programme itself.
ECONOMIC EVALUATION: It is used during the programme's implementation and looks to measure the benefits of the programmes against the costs. Doing so generates useful quantitative data that measures the efficiency of the programme.
IMPACT EVALUATION: It studies the entire programme from beginning to end, and looks to quantify whether or not it has been successful.
GOALS-BASED EVALUATION: It is usually done towards the end of the program or at previously agreed-upon intervals.
DIAGNOSTIC EVALUATION: It refers to the evaluation procedure aims to diagnose the nature and degree of learning difficulties faced by the learner.
ACHIEVEMENT TEST: An achievement test is a test of developed skill or knowledge. The most common type of achievement test is a standardized test developed to measure skill and knowledge learned in a given grade level, usually through planned instruction, such as training or classroom instruction.

OPEN BOOK EXAMINATION SYSTEM: An open book examination is an examination given in a course where the students are allowed to use certain resources during the test. This usually includes a textbook and lecture notes, but some will allow consultation of internet sources as well.

EVALUATION IN CHOICE BASED CREDIT SYSTEM (CBCS) IN HIGHER EDUCATION: It is a student-centric course which allows students to choose their subjects. The subjects can be at a basic or advanced level. Instead of the conventional marking system, CBCS system uses credits. This system provides flexibility in preparing the curriculum and granting credits based on the course intensity and teaching hours.

COMPUTER BASED TESTING: It is lauded as the answer to having cheaper and speedier test delivery for state and district-wide assessments. It is also seen by some as an avenue toward greater accessibility for students with disabilities.

Section – 2: Key Statements

Every candidates appearing for NET/SET examination should follow these key (main) points those can help them a better understanding regarding this unit very quickly.

Key Statements:

Teaching (2): Traditional Concept (2), Modern Concept (2), Objectives of Teaching (3), Characteristics of Teaching (5), Basic Requirements of Teaching (6), Steps of Teaching (7); Types of Teaching Models (8): Advanced Organizer Model (Ausubel's Model) (8.1), Inquiry Training Model (Schumann's Model) (8.2), Mastery Learning Model (Bloom's Model) (8.3); Concept of Learning (9); Characteristics of Adolescent and Adult Learners (10); Relationship of Teaching and Learning (12);Factors of Teaching: Teacher (13), Learner (14), Support Materials (15), Instructional Facilities (16), Teaching Aids (16.1), Learning Environment and Institution (17); Teaching Methods (18): Teacher Centred vs. Learner Centred Methods (19), Off-line vs. On-line Methods (20), Teaching Strategy (21),Teaching Tactics (22), Lecture Method (23.1), Lessons Demonstration (23.2), Programmed Instruction (23.3), Project Teaching Method (23.4), Group Discussion Method (23.5),Brain Storming (23.6), Laboratory Method (23.7), Team Teaching (24.1), Micro Teaching (24.2), Dynamic Teaching (24.3); Teaching Support System: Traditional System (25), Modern System (26), ICT Based System (27); Evaluation (28): Continuous and Comprehensive Evaluation (30), Formative Evaluation (31.1), Summative Evaluation (31.2), Process Evaluation (31.3), Outcome Evaluation (31.4), Economic Evaluation (31.5), Impact Evaluation (31.6), Goals-Based Evaluation (31.7), Diagnostic Evaluation (31.8), Achievement Test (31.9), Open Book Examination System (31.10), Choice Based Credit System (32), Computer Based Testing (33).

[N.B. – Numbers in parenthesis are the reference number]

Section – 3: Key Facts and Figures

Sub Unit – 1
Teaching: Nature, Objectives, Characteristics and Basic Requirements

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1. Introduction

'Education is the manifestation of perfection already in man' – Swami Vivekananda.

Education is a powerful instrument of all types of transformation viz. personal transformation, social transformation and cultural transformation those are advantageous to the society.

The progress and prosperity of a nation depends upon the development of its human resources. For this purpose, there need highly efficient and qualified teachers. Teaching aptitude is all about evaluating candidates who wants to enter teaching profession on the basis of their knowledge and skills. It refers a basic quality required to become a successful teacher. This includes qualification, intelligence, attitude and many other qualities expected from a person who wants to become a successful teacher.

Apart from teaching concepts, teaching objectives, teaching methods, and teaching aids that are specifically mentioned in the syllabus, many questions have been asked on classroom situations in NET/SET examination. The ensuing discussion will help candidates to correctly comprehend these types of questions.

2. Concept of Teaching

The chief task of education is, above all, to shape man, or to guide the evolving dynamism through which man forms himself as a man."

- **Traditional concept:** Teaching is the act of imparting instructions to the learners in the classroom situation. It is traditional class-room teaching. In traditional class-room teaching the teacher gives information to students, or one of the students or one of the students reads from a text-book, while the other students silently follow him in their not merely imparting knowledge or information to students. While imparting knowledge teacher should kept in mind the child as well as the orderly presentation of subject-matter.

- **Modern concept:** Teaching is to cause the pupil to learn and acquire the desired knowledge, skills and also desirable ways of living in the society. It is a process in which learner, teacher, curriculum and other variables are organized in a systematic and psychological way to attain some pre-determined goals.

Teaching can be defined in the following way:

(i) Teaching is a purposeful direction and management of the learning process.

(ii) Teaching is a process of providing opportunities for students to produce relatively permanent change through engagement in experiences provided by the teachers.

(iii) Teaching is skilful application of knowledge, experience, and scientific principles with an objective to set up an environment to facilitate learning.

(iv) Teaching is a planned activity, and effective teaching depends on the following:

(a) How clearly the students understand what they are expected to learn.

(b) How accurately their learning can be measured.

(v) Teaching is a process in which the learner, teacher, and other variables are organized in a systematic way to attain some predetermined goals.

(vi) Teaching is an activity that causes the child to learn and acquire the desired knowledge and skills and also the desired ways of living in the society.

(vii) Effectiveness of teaching has to be judged in terms of learning outcomes of students.

3. Objectives of Teaching

It is well known to all of us that teaching is not a process that could be undertaken by anybody, in any situation, any time and place in one hand and it has also a psychological and philosophical phenomenon behind it on the other. So, there are necessarily some objectives of teaching. Some remarkable objectives of teaching are –

(i) Learner's All Round Development:

All-round development of the learner is the prime objective of teaching that includes the learner's physical, mental and moral development.

(ii) Change of Behaviour:

The education should be imparted to a learner in such a way that it reflects the attitude, behaviour and personality of the learner. A child is supposed to be ignorant and innocent about his surroundings. It is the way the things are taught to him that he changes his opinion about his environment and behaves like a human beings.Value education stands for inculcation of virtues.

(iii) Development of Adjustment:

The manner of teaching should be such that it makes the students feel at home in his class room. The teacher has to ensure that the learner is well adjusted to the environment which includes his classmates, schoolmates and other members of his society at large.

(iv)Learner's Mental Ability:

The teacher should take into account the mental ability of the pupils while teaching. This will enable the teacher to make himself more communicative with his students and in turn the students will have a better understanding of what is being taught to them.

(v) Transmission of Knowledge:

The process of teaching should ensure that the knowledge is transmitted from the teacher to the pupil. For achieving this objective, the teaching needs to be very communicative and the process of teaching should ensure the pupil participation in it. The more the pupils are encouraged to interact with the teacher, the more the chances of transmission of knowledge.

(vi)Assimilation of Lessons:

Teaching does not stop at delivering lectures and giving home tasks to the students. It has to be responsible for the assimilation of what is taught to the students. The manner of teaching should be pleasant enough to make the students grasp whatever they are taught.

(vii) Friendly Environment:

One of the primary objectives of teaching is to make the environment of the place of teaching more friendly and conducive to learning. The learner should feel comfortable during the process of teaching and learning. His all attention should remain focused to the teaching and he should not get irritated with the non-conducive atmosphere of the class room.

4. Levels of Teaching (Memory, Understanding and Reflective)

It is very well-known that teaching is a purposeful activity as through teaching the teacher brings a desirable change in the learner. Both the concepts teaching and learning are interrelated to each other. Development of all-round personality of the learner is the final goal of teaching and learning. During teaching an interaction takes place between an experienced person (teacher) and an inexperienced person (student). Here the main aim is to bring change in the behaviour of the student.

Teachers teach students at three levels:

(i) Memory level: Thoughtless teaching

(ii) Understanding level: Thoughtful teaching

(iii) Reflective level: Upper thoughtful level

(i) Memory Level of Teaching:

It is the first and thoughtless level of teaching. It is concerned with memory or mental ability that exists in all living beings. Teaching at memory level is considered to be the lowest level of teaching. At this level,

(i) The thinking ability does not play any role.

(ii) Students only cram the facts, information, formulas and laws that are taught to them.

(iii) The teaching is nothing but learning the subject matter by rote.

(iv) The role of the teacher is prominent and that of the student is secondary.

(v) The study material is organized and pre-planned. The teacher presents the study material in a sequential order.

Merits:

(i) Useful for children at lower classes. This is because of their intellect us under development and they have a rote memory.

(ii) The role of the teacher is important in this level of teaching and he is free to make choices of subject matter, plan it and can present it at will.

(iii) The knowledge acquired at memory level teaching forms a basis for the future i.e. when student's intelligence and thinking is required.

(iv) Memory level teaching acts as the first step for understanding and reflective levels of teaching. It is pre-requisite for understanding level teaching.

Demerits:

(i) This does not contribute to the development of the student's capabilities.

(ii) Since at this level student learns by rote, the knowledge gained does not prove helpful in real life situations as it does not develops the talents of students.

(iii) The pupils are kept in strict discipline and cramming is insisted on this teaching.

(iv) Intelligence does not carry any importance in this type of teaching and it lacks motivation.

(ii) Understanding Level:

Understanding something is to perceive the meaning, grasp the idea and comprehend the meaning. In the field of Education and Psychology, the meaning of 'understanding' can be classified as

(i) Seeing the total use of facts

(ii) Seeing relationship

(iii) A generalized insight

The teaching at the understanding level is of a higher quality than the one at the memory level. It is more useful and thoughtful from the point of view of mental capabilities.

Merits:

(i) At this level of teaching students to make use of their thinking abilities.

(ii) Knowledge acquired at this level forms the basis of the reflective level of teaching.

(iii) Here the teacher presents subject matter before the students in an organized and sequential form. The new knowledge acquired is related to the previously acquired knowledge.

(iv) Here the students do not learn by rote. Here they learn by understanding the facts and information and their use and purpose.

Demerits:

(i) Teaching at this level is subject centred. There is no interaction between the teacher and students at this level.

(ii) This type of teaching mastery i.e. emphasized.

(iii) Reflective Level of Teaching:

This level is also known as introspective level. Reflecting on something means giving careful thought to something over a period of time. It also means thinking deeply about something. Reflective level of teaching is considered to be the highest level at which teaching is carried out.

(i) It is highly thoughtful and useful.

(ii) A student can attain this level only after going through memory level and understanding level.

(iii) Teaching at the reflective level enables the students to solve the real problems of life.

(iv) At this level, the student is made to face a real problematic situation. The student by understanding the situation and using his critical abilities succeeds in solving the problem.

(v) At this level emphasis is laid on identifying the problem, defining it and finding a solution to it. The student's original thinking and creative-abilities develop at this level.

(vi) The role of the teacher in this level of teaching is democratic. He does not force knowledge on the students but develops in their talents and capabilities.

(vii) The role of the students is quite active.

(viii) Reflective level of teaching is that which is problem-centred and the student is busy in original imagination.

Merits:

(i) The teaching at this level is not teacher-centred or subject-centred, it is leaner-centred.

(ii) There is an interaction between the teacher and the taught at the reflective level teaching.

(iii) At this level, teaching is appropriate for the higher class.

(iv) At this level, teaching is highly thoughtful and useful than the teaching at the memory or understanding level.

Demerits:

(i) It is not suitable for small children at the lower level of teaching. It is suitable only for mentally matured children

(ii) At this level, the study material is neither organized nor pre-planned. Therefore students cannot acquire systematic and organized knowledge of their study courses.

5. Characteristics of Teaching

'The aim of teaching is simple: it is to make student learning possible...To teach is to make an assumption about what and how the student learns; therefore, to teach well implies learning about students' learning' (Ramsden, 1992).

One set of characteristics of good teaching, extracted from research studies and summarised from the individual lecturer's point of view (Ramsden, 2003) includes:

(i) A desire to share your love of the subject with students.

(ii) An ability to make the material being taught stimulating and interesting.

(iii) A facility for engaging with students at their level of understanding.

(iv) A capacity to explain the material plainly.

(v) A commitment to making it absolutely clear what has to be understood at what level and why.

(vi) Showing concern and respect for students.

(vii) A commitment to encouraging independence.

(viii) An ability to improvise and adapt to new demands.

(ix) Using teaching methods and academic tasks that require students to learn actively, responsibly and co-operatively.

(x) Using valid assessment methods.

(xi) A focus on key concepts, and students' misunderstandings of them, rather than covering the ground.

(xii) Giving the highest quality feedback on student work.

(xiii) A desire to learn from students and other sources about the effects of teaching and how it can be improved.

(xiv) For primary level students, teachers should be compassionate as they can deal with children with love and affection. Thus, at this level most of the teachers should be female teacher.

6. Basic Requirements of Teaching

Teaching process involves following variable:

1. Dependent Variable:

The student is a dependent variable. He is subjected to changes and developments through the efforts of the teacher and teaching process. In the process of teaching, the dependent variable plays the functional or active part.

2. Independent Variable:

The teacher is an independent variable. He is responsible for the functioning of students, the dependent variables. He is free to act in the process while students are quite dependent on him. The teacher plans, organizes, leads and controls the process of teaching. Like dependent variables, independent variables also play the functional creative part. An effective teacher always motivates students to learn more and more. The teacher has been glorified by the phrase "friend, philosopher and guide" because he transmits the high value of humanity to students.

3. Intervening or Medial Variables:

There is need of desirable interaction between the dependent and independent variable to achieve the goals of teaching. This role is played by the intervening variables. The content of teaching, methods and techniques, tactics and strategies management of instructional material and teaching environments, etc. are Intervening Variables.

Basic Requirements of Teaching are:

(i) All the three variables of teaching.

(ii) Professionalism.

(iii) Suitable environment.

(iv) Teacher-student relationship.

(v) Student's discipline.

(vi) Teacher's devotion to teaching, and also on the other hand, student's devotion to learning.

(vii) Greater the handicap of the students coming to the educational institutions, greater the demand on the teacher.

7. Steps of Teaching

Some important steps of teaching are as follows:

(i) Decide how you want to teach.

(ii) Decide on mode of delivery.

(iii) Work in a Team.

(iv) Build on existing resources.

(v) Master the technology.

(vi) Set appropriate learning goals.

(vii) Design course structure and learning activities.

(viii) Communicate, communicate, and communicate.

(ix) Evaluate and innovate.

8. Types of Teaching Models

The core of the process of teaching is the arrangement of environments within which the students can interact. A model of teaching is a plan or pattern that we can use to design face-to-face teaching in classroom. Each model guides us as we design instruction to help students achieve various objectives. Israel Shaffer has put forth three philosophical models:

- Impression Model
- Insight Model
- Rule Model

Another contribution was of John P Pecesces, who gave the following classification:

- Basic Teaching Model
- Computer Based Teaching Model
- Teaching Model for School Learning
- Interaction Model of Teaching

B. R. Joyce has divided all the learning models in these groups:

- Social Interaction Model
- Personal Source
- Behaviours Modification Source

8.1. ADVANCED ORGANIZER MODEL (AUSUBEL'S MODEL)

Ausubel's primary concern is to help teachers organize and convey large amounts of information as meaningfully and efficiently as possible. This model is designed to strengthen student's cognitive structures, a term Ausubel uses for a person's knowledge of a particular subject matter at any given time and how well organized, clear and stable it is.

It is based on the following principles:

(i) Principle of Progressive Differentiation:

(a) First, the most progressive idea about the subject is presented.

(b) Then are progressively differentiated in terms of detail and specifically.

(ii) Principle of Integrated Reconciliation: It simply means how the ideas should be consciously reconciled and integrated, with previous knowledge. Thus, the model is called Advanced Organizer Model.

SYNTAX OF THE ADVANCED ORGANIZER MODEL	
Phase	**Activities**
Phase - I: Presentation of Advanced Organizer	1. Clarify aims of the lesson 2. Present organizer Identify defining attributes - Give examples - Provide context - Report 3. Prompt awareness of learner's relevant knowledge and experience
Phase - II: Presenting the Learning Task	1. Present material 2. Maintain attention 3. Make organization explicit 4. Make logical order of learning material explicit
Phase - III: Strengthening the Cognitive Organization	1. Use principles of integrative reconciliation 2. Promote active reception learning 3. Elicit critical approach to subject matter 4. Clarity

8.2. INQUIRY TRAINING MODEL (SCHUMANN'S MODEL)

It was developed by Richard Schumann (1962) to teach students a process for investigating and explaining unusual phenomena. His mode takes students through miniature versions of the kinds of procedures that scholars use to organize knowledge and generate principles. Based on a conception of scientific method, it attempts to teach students some of the skills and language of scholarly inquiry.

SYNTAX OF THE ADVANCED ORGANIZER MODEL	
Phase	**Activities**
Phase - I: Confrontation with Problem	- Explain inquiry procedures - Present discrepant event
Phase - II: Data Gathering and Verification	- Verify the nature of objects and conditions - Verify the occurrence of the problem situation
Phase - III: Data Gathering Experimentations	- Isolate relevant variables, Hypothesis (and test), causal relationships.
Phase - IV: Organization and Formulating an Explanation	- Formulate rules or explanations
Phase - V: Analyze Inquiry Strategy and Develop More Effectiveness	

8.3. MASTERY LEARNING MODEL (BLOOM'S MODEL)

Mastery learning is a term, formulated by John B. Carroll (1971) and Benjamin Bloom (1971). Mastery learning provides a compact and interesting way of increasing the likelihood that more students will attain a satisfactory level of performance in school subjects.

They transformed their views into a system with the following characteristics:

(i) Mastery of any subject is defined in terms of sets of major objectives which represent the purpose of the course or unit.

(ii) The substance is then divided into a larger set of relatively small learning units, each one accompanied by its own objectives, which are parts of the larger ones or thought essential to their mastery.

(iii) Learning materials are then identified and the instructional strategy selected.

(iv) Each unit is accompanied by brief diagnostic tests which measure the student's developing progress (the formative evaluation) and identify the particular problem each student is having.

(v) The data obtained from administering the test is used to provide supplementary instruction to the students to help them overcome their problems.

PHASES IN MASTERY LEARNING MODEL	
Phases	**Activities**
Phase - I: Core Teaching Session	1. Informing the students about instructional objects. 2. Making the expected mastery level explicit to student. 3. Presenting the learning task to the class as a whole. 4. Administering mastery test and diagnosing pupil's difficulty.
Phase - II: Differential Teaching Session	1. Clarify the pupil according to mastery level. 2. Provide alternative learning material to different groups. 3. Organizing small groups instructor with teachers. 4. Organizing tutoring pairs with the peer group. 5. Diagnosing individual study. 6. Administering diagnosing test and pupil's evaluation.
Phase - III: Intensive Teaching Session	1. Tutoring by peers and the teacher. 2. Providing further material for practice. 3. Consolidation of gains in differential teaching sessions. 4. Administering mastery test.

Sub Unit – 2

Learner's Characteristics

9. Concept of Learning

Learning is a key process in human behaviour. All living is learning. If we compare the simple, crude ways in which a child feels and behaves, with the complex modes of adult behaviour, his skills, habits, thought, sentiments and the like- we will know what difference learning has made to the individual.

The individual is constantly interacting with and influenced by the environment. This experience makes him to change or modify his behaviour in order to deal effectively with it. Therefore, learning is a change in behaviour, influenced by previous behaviour. As stated above the skills, knowledge, habits, attitudes, interests and other personality characteristics are all the result of learning.

Learning is defined as "any relatively permanent change in behaviour that occurs as a result of practice and experience". This definition has three important elements.

(i) Learning is a change in behaviour – better or worse.

(ii) It is a change that takes place through practice or experience, but changes due to growth or maturation are not learning.

(iii) This change in behaviour must be relatively permanent, and it must last a fairly long time.

10. Characteristics of Adolescent and Adult Learners (Academic, Social, Emotional and Cognitive)

The young adolescent is going through a period of significant physical, emotional, intellectual, moral and social changes. Since the nature of these changes is at times intense and varied, they need to be recognized and examined by those who direct their learning.

10.1. Academic:

Academic characteristics of learners include the education type, education level and knowledge. In young adolescents, intellectual development is not as visible as physical development, but it is just as intense. During early adolescence, youth exhibit a wide range of individual intellectual development, including meta-cognition and independent thought. They

tend to be curious and display wide-ranging interests. Typically, young adolescents are eager to learn about topics they find interesting and useful—ones that are personally relevant. They also favour active over passive learning experiences and prefer interactions with peers during educational activities. All students have some personal knowledge to relate to what is being taught. It is creative challenge of a teacher to continually discover, or pre-assess, for meaningful connections between pivotal subject matter concepts, related topics, and the experiences students bring to the classroom. These connections create springboards for learning. Teacher should affirm student's progression learning academic concepts, successes in reaching certain goals, and improvement in behaviours that benefit them as learners.

10.2. Social:

Adolescent social development is often described as the process of establishing a sense of identity and establishing a role and purpose. It is an outward sense of oneself. Body image is a key factor in developing a sense of self and identity, especially for girls, and the family and increasingly peers play an important role assisting and supporting the adolescent to achieve adult roles. Risk-taking is a natural part of the adolescent journey. Social development and emotional development are closely intertwined as young people search for a sense of self and personal identity. They desire to make personal choices. They seek social acceptance and peer relationships in order to conform to group norms. They tend to diminish family allegiances and strengthens peer allegiances but still strongly dependent upon parental values. The actions of adolescents are often based on myths and misinformation. In addition, the influence of the media and the culture affect their perception of men, women and relationships. Students should be taught to deal with social pressures resulting from competitions. Healthy attitudes towards competition should be encouraged. Students should be encouraged to strive for self-improvement.

10.3. Emotional:

The way a person thinks and feels about themselves and others, their inward thoughts, is key to their emotional development. Adolescents shifts moods rapidly and can become rebellious toward adults. They are sensitive to criticism and easily get offended. Developing and demonstrating individual emotional assets such as resilience, self-esteem and coping skills is heightened during adolescence because of the rapid changes being experienced. Schools are

important sites for social and emotional learning and have developed policies and programs around student wellness, often with a focus on a strengths-based approach.

10.4. Cognitive:

Cognition is the process involving thought, rationale and perception. The physical changes of the brain that occur during adolescence follow typical patterns of cognitive development. They are characterized by the development of higher-level cognitive functioning that aligns with the changes in brain structure and function, particularly in the prefrontal cortex region. Adolescence is a sensitive brain period that is a time when brain plasticity is heightened. During this time, there is an opportunity for learning and cognitive growth as the brain adapts in structure and function in response to experiences. Teachers need to provide an assortment of educational approaches and materials that are appropriate for their student's wide-ranging cognitive abilities. For example, the concrete thinkers require more structured learning experiences, while the abstract thinkers need more challenging activities. In addition, young adolescents need teachers who understand and know how they think Teachers need to plan curricula around real life concepts and supply authentic educative activities (e.g., experimentation, analysis and synthesis of data) that are meaningful for young adolescents. Because young adolescent's interests are evolving, they require opportunities for exploration throughout their educational programme must be continuous and gradual.

11. Individual Differences

People are more different than they are alike, and there is probably no environment that elicits individual differences sooner in life than formal education.

Individual differences in academically related characteristics can make for success or failure in one of life's most important pursuits – obtaining an education. As a result, a primary focus of applied educational psychologists has been the identification of methods that allow each individual to achieve their maximum educational performance. Some students in a class exhibit great curiosity for learning because such children are gifted children. A special child who suffers for reading disorder is called Dyslexia

In education, teachers strive to arrange conditions that elicit optimal performance in all students. However, the optimal learning conditions and techniques for one student may not facilitate the best performance in another student.

According to Corno et al. (2002), each individual 'has worked out over many years how to respond in her own way to symbol systems and social cues. Each has aptitude for particular situations. Recognizing specifically the qualities each person brings to a situation, then adjusting the situation to improve the fit – these are major tasks of those who work with people'.

According to Wang (1987), 'theoretical and technical advances in research on learning and effective schooling, particularly those which have occurred during the past decade, have greatly influenced the nature and type of information on individual differences that has been considered instructional planning and educational placement of learners with special needs'.

12. Relationship of Teaching and Learning

A good teacher is like a candle, it consumes itself to light the way for others. It is an important part of the process of education. Its special function is to impart knowledge develop, understanding and skill. There is a close relationship between teaching and learning. A teacher is said to be teaching when he/she is helping someone else to learn. There are some disturbances in the classroom by some students while delivering lecture. In this situation a teacher should motivate to teach those students who are causing disturbances. A teacher can establish rapport with his students by impressing students with knowledge and skill.

The quality of a teacher's teaching is directly related to the quality and value of the learning that is taking place in his students. A teacher and his students interact and communicate, generally, under three types of relationships:

(i) Authoritarian

(ii) Democratic

(iii) Laissez-faire

However, in actual classroom situations, we find that these three types of relationships overlap. For example, a teacher is not always democratic. Sometimes he turns out to be authoritative or laissez-faire. Different types of relationship create distinctive personality characteristics in students. The students taught by an authoritarian teacher develop apathy and dependency characteristics. They lack the capacity for initiation and group action and show no interest in their work.

The teaching-learning process generally operates at three levels which include:

(i) Memory level

(ii) Understanding level

(iii) Reflective level

Memory level of teaching-learning means committing factual information to memory. If we observe teachers in the classrooms, we will find that majority of the cases the teaching is being carried out at memory level. The teacher gives factual material which students memorize without understanding it. This type of teaching seems to be based on the S-R conditioning theory of learning in which bondage is formed between the stimuli (S) and response (R) without involving any purpose.

Sub Unit – 3

Factors Affecting Teaching

Many philosophers of education have termed ‘teaching as a triangular process where teacher, learner and subject (topic) lie on three corners. To this may be added one or more corner i.e. the environment. It is where all other three meet and where teaching-learning process takes place. All these four elements have their own importance.

Thus four fundamental factors are required to conduct a teaching-learning programme. These are discussed in brief:

13. Teacher

The teacher is an innovator of information and knowledge. He is the creator and transmitter of knowledge, values and ethos to our youngsters for latter’s physical, mental, emotional and social development. In the process of teaching-learning, the teacher is the main vehicle, and he knows what is right and what is wrong in the society. The role and responsibility of the teacher is to transmit the right values so as to modify the behaviour of the learner. He should therefore use the latest means of media communication in the process of teaching.

13.1. Special Characters of a Good Teacher:

(i) The teacher masters over his subject and uses an effective language for the communication in order to bring a positive change in the behaviour of the learner. Lack of subject knowledge is the most important cause of failure for the teachers in continuing teaching process.

(ii) According to Swami Vivekananda, teacher's success depends on his mastery on the subject and capacity in controlling the students.

(iii) If a teacher gets an opportunity to teach a visually challenged student along with normal students, he must arrange a seat in the front row and try to teach at a pace convenient to him.

(iv) Interaction inside the class room should generate ideas to the students.

(v) Since, it is the age of science and technology, the teacher ought to have a sound knowledge of science and technology.

(vi) A disciplined teacher is liked most to the students and the most important challenge of a teacher is to make teaching-learning process enjoyable.

(vii) In the present scenario, a teacher should have proper knowledge of student's needs and use of technology in teaching-learning process to adjust effectively with the classroom teaching.

(viii) Sometime many teachers cannot control classroom situation and become nervous. This symptom of nervous instability among teachers is called explosive behaviour. It is not desirable in teaching-learning process.

(ix) Attitude of the teacher that affects teaching pertains to affective domain.

(x) A teacher should not be remembered the socio-economic condition and background of students while teaching-learning process is continued.

(xi) Teacher's role at higher education level is to promote self-learning in students.

14. Learner

The learner is a dependent one and immature in knowledge. He has to cooperate in the teaching-learning process with the teacher and try to get as much information and knowledge as possible from him. He must follow the teacher for understanding and getting knowledge. The learners may be categorized as the students of primary schools, elementary schools, secondary schools, higher/senior secondary schools, colleges or universities. All of them have a vital role to play in the programme of teaching and learning. The teacher must have the capability to understand their diversities and treat them accordingly. The parents of the learner have significant role for academic performance of students. The academic performance of students can be improved if parents are encouraged to interact with teachers frequently.

15. Support Materials [Visual and Audio Visual]

The subject is the main concern in the whole endeavour of teaching-learning process. The topic is generally decided by the teacher but the learner can also contribute in deciding a topic, so that, a balanced and harmonious development takes place. It is for the teacher to prepare necessary charts, maps, tables and models that pertain to the decided topic. Media based technological and scientific aids may also be made available by the teacher to make the teaching more interesting and understandable.

16. Instructional Facilities

Instructional facilities are defined as classrooms, seminar rooms, instructional laboratories, computer laboratories, on-campus clinics, cybraries and other spaces used principally for the purpose of delivering formal instruction to our university students. The issue of classroom and instructional facilities planning and utilization continues to be a contested discussion on our campus. On the campus, following the principle that we will maximize utilization across the time in a weekday and across all class days, we are able to seat requested course sections in our available space. But it has been expressed that we have insufficient classroom space for the appropriate scheduling of the courses we offer our students.

As an effort to address this current state, we should implement the following approaches for the management of our instructional facilities:

(i) Identify all spaces in the campus space inventory that conform to the above definition and the Space Management Officer responsible for these spaces

(ii) Require each Space Management Officer managing instructional facilities to submit utilization reports for the past three years

(iii) Evaluate both central and unit classroom utilization compared with the standards as described below and determine under/over - supply of instructional facilities

(iv) Determine future utilization plans and facility needs based on changing enrolment assumptions utilizing these standards. Utilize these standards as well to monitor and evaluate actual vs. planned use over time

(v) For skill development of learner's verbal guidance is the least effective.

(vi) Implement the following procedural elements to more effectively manage classroom utilization:

  (a) Evaluate the possibility of managing all classrooms as general assignment spaces to be scheduled by University Scheduling Office rather than by individual units or suggest some other method that ensures maximal efficient use of instructional facility space

  (b) All lecture and discussion sections are to be held in general assignment classrooms and in standard time blocks unless an exception is granted

  (c) Space Management Officers (or their designees) must approve classes being held in other than general assignment classrooms and in other than standard time blocks

  (d) Class time blocks may need periodic revisions

  (e) Class Lab /Clinic/Studio Space Utilization

(f) Class labs are assigned and scheduled by individual departments

(g) Justification for future existing or expanded teaching lab space is based on current utilization of class labs, as well as a projected curriculum plan for each department. If class labs are not fully utilized, they should be shared with other departments

(h) If chronic underutilization occurs, an evaluation should be conducted with a possible outcome that the spaces be reassigned to better serve campus space needs

(i) Establish an Instructional Facilities subcommittee that coordinates an annual process of review, recommendation and implementation of classroom supply, scheduling and physical attributes improvement

16.1. Teaching AIDs / Instruction:

There are many types of effective teaching aids which activate all faculties.

Projected Visual Aids:

(i) Direct projection: Slide and Film projection

(ii) Indirect projection: Overhead projector

(iii) Reflected projection: Opaque projector and epidiascope

Projected Visual Aids:

(i) Charts

(ii) Flash card

(iii) Poster

(iv) Pictures and photographs

(v) Graphs

(vi) Maps

(vii) Diagrams

(viii) Display board

(ix) Three-dimensional models

(x) Objects, specimens and globe

Audio-Aids:

(i) Radio

(ii) Recordings

(iii) Digital audio player

(iv) Telephone and mobile

(v) Television

Activity-Aids:

(i) Field trip

(ii) Experimentation

(iii) Dramatics

(iv) Teaching machines

(v) Programmed instructions

16.2. Importance of Teaching Aids:

The importance of teaching aids is as follows:

(i) Teachers use visually-aids to make learning interesting.

(ii) Teachers use teaching aids to make students attentive.

(iii) Teachers use blackboard as a teaching aid for writing the important points as clearly as possible.

(iv) Instructional aids are used by the teacher to clarify the concepts to the students.

(v) The use of teaching aids is justified on the grounds of optimising learning outcomes of students.

17. Learning Environment and Institution

Learning environment can refer to an educational approach, cultural context, or physical setting in which both teaching and learning occurs. The term is commonly used as a more definitive alternative to 'classroom', but it typically refers to the context of educational philosophy or knowledge experienced by the student and may also encompass a variety of learning cultures – its presiding ethos and characteristics, how individuals interact, governing structures, and philosophy. In a societal sense, learning environment may refer to the culture of the population it serves and of their location. Learning environments are highly diverse in use, learning styles, organization, and educational institution. The culture and context of a place or organization includes such factors as a way of thinking, behaving, or working, also known as organizational culture.

For a learning environment such as an educational institution, it also includes such factors as operational characteristics of the instructors, instructional group, or institution; the philosophy

or knowledge experienced by the student and may also encompass a variety of learning cultures – its presiding ethos and characteristics, how individuals interact, governing structures, and philosophy.

17.1. Effectiveness of Teaching-Learning Process:

(i) Effective teaching is a function of teacher's making students learn and understand.

(ii) A teacher should not give punishment to the student as it is the least important factor in teaching process.

(iii) The essence of an effective classroom environment is lively student – teacher interaction

(iv) On the first day of class, if teacher is asked by the students to introduce himself, he should tell them about himself in brief

(v) In a lively classroom situation, there is likely to be frequent teacher-student dialogue.

Sub Unit – 4

Methods of Teaching in Institutions of Higher Learning

18. Concept of Teaching Methods

A teaching method comprises the principles and methods used by teachers to enable student learning. These strategies are determined partly on subject matter to be taught and partly by the nature of the learner.

For a particular teaching method to be appropriate and efficient it has to be in relation with the characteristic of the learner and the type of learning it is supposed to bring about. Suggestions are there to design and selection of teaching methods must take into account not only the nature of the subject matter but also how students learn. In today's school the trend is that it encourages a lot of creativity. It is a known fact that human advancement comes through reasoning. This reasoning and original thought enhances creativity.

19. Teacher Centred vs. Learner Centred Methods

The approaches for teaching can be broadly classified into teacher-centred and student-centred. Teachers are the main authority figure in the Teacher-Centred Approach to Learning and students are viewed as ‘empty vessels’ whose primary role is to passively receive information (via lectures and direct instruction) with an end goal of testing and assessment. It is the primary role of teachers to pass knowledge and information onto their students. In this model, teaching and assessment are viewed as two separate entities. Student learning is measured through objectively scored tests and assessments.

In Student-Centred Approach to Learning, while teachers are the authority figure in this model, teachers and students play an equally active role in the learning process. The teacher's primary role is to coach and facilitate student learning and overall comprehension of material. Student learning is measured through both formal and informal forms of assessment, including group projects, student portfolios, and class participation. Teaching and assessments are connected; student learning is continuously measured during teacher instruction. Commonly used teaching methods may include class participation, demonstration, recitation, memorization, or combinations of these.

A Look at the Differences between Teacher-Centred and Learner-Centred Learning

Teacher-Centred	Learner-Centred
Focus is on instructor	Focus is on both students and instructor
Focus is on language forms and structures (what the instructor knows about the language)	Focus is on language use in typical situations (how students will use the language)
Instructor talks; students listen	Instructor models; students interact with instructor and one another
Students work alone	Students work in pairs, in groups, or alone depending on the purpose of the activity
Instructor monitors and corrects every student utterance	Students talk without constant instructor monitoring; instructor provides feedback/correction when questions arise
Instructor answers students' questions about language	Students answer each other's questions, using instructor as an information resource
Instructor chooses topics	Students have some choice of topics
Instructor evaluates student learning	Students evaluate their own learning; instructor also evaluates
Classroom is quiet	Classroom is often noisy and busy

20. Off-Line vs. On-Line Methods

Although online learning has become the preferred method for the majority of learners, it's important not to dismiss the benefits of offline training too. With online training courses, you and the course attendees benefit from a more casual, flexible approach. Being unrestricted in regard to location and times means every learner can benefit from the courses. With offline learning, it's easier to ensure attendees are paying attention to the training. Some learners also find it easier to retain the knowledge and skills they've learnt through offline training than they do with online training.

The key difference between online learning and offline learning are:

(i) **Location:** With offline learning, participants are required to travel to the training location, typically a lecture hall, college or classroom. On the other hand, with online

learning the training can be conducted from practically anywhere in the world. Participants simply need to log on to the internet from their home, work or even their local coffee shop.

(ii) **Flexibility:** Online learning usually has a more flexible timescale. As a trainer, you can offer your support via email or through an online chat system. With offline learning, it is typically carried out between office hours and doesn't offer as much flexibility to the learner or the trainer.

20.1. Blended Learning:

Blended learning is an approach to education that combines online educational materials and opportunities for interaction online with traditional place-based classroom methods. It requires the physical presence of both teacher and student, with some elements of student control over time, place, path, or pace. Now a days this is the most effective mode of learning.

21. Meaning of Teaching Strategy

Teaching strategies refer to methods used to help students learn the desired course contents and be able to develop achievable goals in the future. It identifies the different available learning methods to enable them to develop the right strategy to deal with the target group identified.
It also refers to the structure, system, methods, techniques, procedures and processes that a teacher uses during instruction. These are strategies the teacher employs to assist student learning.

22. Meaning of Teaching Tactics

Teaching tactics encourage active learning. Use the following tactics during class to ensure that students are actively engaged in thinking about the content. Students should be routinely called upon to: summarize or put into their own words what the teacher or another student has said.
Use the following tactics during class to ensure that students are actively engaged in thinking about the content. Students should be called on randomly (using the deck of cards method for instance) so that everyone participates. When students do not know when they will be called on they are much more likely to remain alert and engaged in the learning process.
Students should be routinely called upon to:

(i) Summarize or put into their own words what the teacher or another student has said.

(ii) Elaborate on what they have said.

(iii) Relate the issue or content to their own knowledge and experience.

(iv) Give examples to clarify or support what they have said.

(v) Make connections between related concepts.

(vi) Restate the instructions or assignment in their own words.

(vii) State the question at issue.

(viii) Describe to what extent their point of view on the issue is different from or similar to the point of view of the instructor, other students, the author, etc.

(ix) Take a few minutes to write down any of the above.

(x) Write down the most pressing question on their mind at this point. The instructor then uses the above tactics to help students' reason through the questions.

(xi) Discuss any of the above with a partner and then participate in a group discussion facilitated by the instructor.

23. Some Important Methods of Teaching

23.1. Lecture Method

Lecture method of teaching is the oldest teaching method applied in educational institution. This teaching method is one-way channel of communication of information. Students' involvement in this teaching method is just to listen and sometimes pen down some notes if necessary, during the lecture, combine the information and organized it.

One of the problems in this method is to grab the attention of students in class room. Another big problem is that many students in the class cannot follow the theme. Learning has a strong influence on method of teaching.

Advantages:

(i) In this teaching method a large amount the topics can be covered in a single class period.

(ii) Using of this method exclude the using of any equipment or Lab.

(iii) Learning material is not required.

(iv) Student listening skills developed.

(v) Logical arrangement of the material in order to present it orally.

(vi) Help to learn languages.

Disadvantages:

(i) Psychologically this method is acceptable because individuals are not alike. Teacher delivers the same lecture to both students without recognizing the individual differences.

(ii) Learning is an active process thus study should encourage to actively participate in the class room instead of just listening the teacher.

(iii) Language using in the lecture is above the standard of the students. They are not able get full advantage of the lecture.

(iv) Lecture are often forgotten by the students soon after while learning is retained if activities are experienced.

(v) Attention level is not the same while student listening the lecture.

23.2. Lessons Demonstration Method

The word demonstration means to give demos or to perform the particular activity or concept. In demonstration method, the teaching-learning process is carried in a systematic way. Demonstration often occurs when students have a hard time connecting theories to actual practice or when students are unable to understand applications of theories. In order to make a success of demonstration method, three things are necessary.

(i) The object being displayed during demonstration should not be so small.

(ii) During the demonstration, the clear language should be used so that pupils may understand concept easily.

(iii) The pupils should be able to question teachers in order to remove their difficulties.

Characteristic:

(i) The demonstration should be done in a simple way.

(ii) In this strategy, attention is paid to all students.

(iii) Goals and objections of demonstration are very clear.

(iv) It is a well-planned strategy.

(v) Time is given for rehearsal before the demonstration.

Steps:

(i) There are six steps of demonstration process.

(ii) Planning and preparation.

(iii) Introducing the lesson.

(iv) Presentation of subject matter.

(v) Demonstration

(vi) Teaching Aids

(vii) Evaluation

Advantages:

(i) It helps a student in having a deeper understanding of the topic.

(ii) It helps students remain active in teaching -learning process.

(iii) It leads to permanent learning.

(iv) It accounts for the principles of reflective thinking.

(v) It helps to create interest for topics among students.

(vi) It helps in arousing the spirit of discovery among students.

(vii) It imparts maximum learning to students.

Disadvantages:

(i) Students cannot benefit with direct and personal experiences as teacher carry out the demonstration.

(ii) It can be costly as it requires costly materials.

(iii) It can be a time-consuming method.

(iv) It is not based on learning by doing.

(v) This method does not provide training for the scientific method.

(vi) There is a lack of experienced teachers to carry out the demonstration.

23.3. Programmed Instruction Method

Program instruction method of teaching is an autocratic and individualized strategy. It is based on psychological principles of operant condition. In this method, the responses of the learner are strictly controlled by the programmer. Its main focus is to bring desirable change in the cognitive domain of the learner's behaviour. The structure of teaching method is that the selected content is analysed and broken into smaller elements. Each element is independent and complete in itself. The programmer develops frames based on each element. Responses are also provided to the learner in the program on some different leaflets. The correct response of the learner is the new knowledge or new behaviour. Immediate confirmation of correct response provides reinforcement to the learner and he proceeds to the next frame. Wrong responses required feedback. Physical presence of the teacher is not necessary. He may come to give instructions regarding the program. Students are left for learning at their own pace.

Types of Programmed Instruction:

There are three types of this teaching strategy

1. **Linear Programming.** It is being used for teaching all subjects. In programed teaching strategy progressive chain elements are presented. Last step is at the mastery level. It is based on five fundamental principles.

(i) Small steps

(ii) Active responding

(iii) Immediate confirmation

(iv) Self-pace

(v) Student testing

2. **Branched Programming:** It is generally used in mechanical fields.
3. **Mathematics:** Retrogressive chain of elements is presented. First step is the master level while the last step is the simplest element.

Advantages:

Following are the advantages of this teaching strategy

(i) The main emphasis is on individual differences and students' involvement.

(ii) There is not fixed time interval for learning. Students may learn at their own pace.

(iii) Learning by doing maxim of teaching is followed to involve learners in the learning process.

(iv) Students are exposed only to correct responses, therefore, possibility to commit errors in reduced.

(v) Immediate confirmation of the results provides reinforcement to the learners and encourages the learners to proceed further. Feedback is provided to wrong answers, so that learner is able to develop mastery over the content.

Disadvantages:

(i) It is very difficult to develop an instructional programme.

(ii) Only cognitive objectives can be achieved.

(iii) Due to tight schedule of time table, students cannot be left to learn at their own pace. It would be very difficult to learn the content the subject matter in a limited period of time.

(iv) There is no chance for students' creativity, their responses are highly structured.

(v) Development of programme is not economical in terms of cost and time.

(vi) In absence of the teacher, students may spoil the disciplinary tone of the class, or they will be helpless when any problem arises.

(vii) It cannot be applied at primary level of education or at higher education.

23.4. Project Teaching Method

Project method of teaching has evolved from the philosophy of programatists. It is experience-centred strategy related to life-situation. This teaching strategy focuses on:

(i) To socialize a child.

(ii) To achieve cognitive, affective and psychomotor objectives.

This teaching strategy is based on the following principles:

(i) Principle of Utility. Choose those projects which are closer to the social life.

(ii) Principle of readiness. Involve the learners in finding the solution of the problem with their active participation.

(iii) Learning by Doing. Learner performs certain tasks and experiences new things. This adds to his knowledge and results in learning.

(iv) Socialization. It develops the feeling of cooperation and group work.

(v) Inter-disciplinary Approach. To involve the knowledge of different subjects in solving the social problems.

Types of Project Method of Teaching:

According to Kilpatric, "A project is a whole-hearted purposeful activity proceeding in a social environment. Kilpatric has classified the project method in four types.

1. **Constructive:** When learners have to construct some things related to social life. e.g. charts, models, maps, parcels etc.
2. **Artistic:** These projects are generally allotted in the aesthetic fields of life. e.g. in music, drawing, painting art and culture.
3. **Problem-Solving:** These projects are given to solve the problems related to any life-situation or related to any subject e.g. how to operate bank accounts? Or how to send an email or letter. These general problems if solved will make a child efficient for social-life.
4. **Group-Work:** A team of students is assigned a work to be performed e.g. to develop a garden in the school.

Advantages:

(i) It helps in developing social norms and social values among the learners.

(ii) It provides invaluable opportunities for correlation of various elements of the subject matter and for transfer of training or learning.

(iii) It helps in growing knowledge very effectively as a result of their close cooperation on social participation in the spirit of democracy.

Disadvantages:

(i) The project cannot be planned for all subjects and whole subject matter cannot be taught by this strategy.

(ii) It is not economical from the point of view of time and cost.

(iii) It is very difficult for a teacher to plan or to execute the projects to the learners and supervise them.

23.5. Group Discussion Method

Group discussion is a child centred strategy, in which students are divided into groups and they are encouraged to discuss on the subject matter given. Group discussion is dominated by the teacher. Classroom climate is autocratic and most of the time, teacher is active and student accept his ideas and views. After giving lectures teachers encourages the student to participate in group-discussion. Teacher supervises them and provides guidance to make the discussion fruitful.

This teaching strategy is focused to achieve higher order of cognitive objectives and affecting objectives. The strategy is based on the following principles:

(i) Principles of active participation

(ii) Principle of learning by listening

Formal and Informal Group Discussion:

Group discussions are organized in two forms: formal and informal. In formal discussion the matter to be discussed is highly structured, proper schedule is prepared and certain rules are followed. Teacher acts as a leader of the group. In informal discussions, the subject matter to be discussed in unstructured. No fixed schedule is prepared and no rules are to be followed. An outstanding student is selected as the leader by the group of students. He plans for the discussion and lead the discussion. Teacher is passive and supervises the pupils involved in the discussion. Planning for group-discussion follows the below given steps.

(i) Topic is decided for discussion.

(ii) Objectives of discussion are decided.

(iii) Time limit is fixed.

(iv) Weightage points are decided.

(v) Penalty points are also decided.

Advantages:

(i) Affective and higher-level cognitive objectives are achieved

(ii) Group discussion helps in developing self-confidence among the learners

(iii) It helps in organizing comparative discussion at favour and disfavour

(iv) It helps in providing freedom for expression to the learners.

(v) It helps in developing habit of cooperation

(vi) It helps in developing habit of listening one's own criticism

(vii) Learners try to reach at one conclusion with the help of team spirit and cooperation

Disadvantages:

(i) Group-discussion cannot be used as a teaching strategy but it can be used as a supplement technique after lecture and demonstration method of teaching.

(ii) This teaching strategy is quite time consuming. So, teacher must fix the time schedule for discussion to make it a purposeful activity

(iii) It can only be applied for average and above average students. So, it is the teacher duty to form groups on the basis of some criteria of intelligence and abilities. He should provide them topics accordingly. So, those students of low intelligence and abilities can also be benefited.

(iv) If not properly organized, it may create bitterness and results are unfruitful. It is just wastage of time. So, a teacher must plan for discussion beforehand to avoid irregularities and make it more effective.

23.6. Brain Storming

In context to teaching, brainstorming is a strategy or tool of teaching used by the teacher in which maximum or all the students participate by responding or presenting views on one topic. This technique encourages new ideas among students which would never have happened under normal circumstances.

It can be explained in following ways:

(i) It is a process of designed to obtain the maximum number of ideas relating to a specific area of interest.

(ii) It is a technique where a group of pupils put social inhabitations and rules aside with the aim of generating new ideas and solutions.

(iii) It is a technique that maximizes the ability to generate new ideas.

Types of Brainstorming:

(a) Traditional brainstorming:

Traditionally for Brainstorming pupil gather in a room and forward their ideas as they occur to them. They are told to lose their inhabitations and no ideas shall be judged. Here pupil should build on ideas called out by other people.

(b) Advanced Brainstorming:

(i) It is an extension of the traditional brainstorming and makes the whole process easier and effective. Advance brainstorming uses new process and new techniques to reduce inhabitations, for example, creative and lateral thinking technique.

(ii) Brain storming software.

(iii) New material for simulation and recording ideas.

Brainstorming in Education:

In the field of education brainstorming is a large or small group of activities that encourage the student to focus on a topic and contribute to the free flow of ideas. In this process

(i) Teacher begins the session by posing a question, problem or by introducing a topic.

(ii) The student then expresses possible answers, relevant words, and ideas.

(iii) The contribution is accepted without criticism or judgment and is then summarized on a white board by the teacher.

(iv) These ideas are examined, usually in an open class discussion format.

Purpose of Brainstorming:

(i) To focus student attention on a particular topic.

(ii) To generate particular ideas.

(iii) To teach acceptance and respect for individual differences.

(iv) To encourage the learner to take a risk in sharing their ideas and opinions.

(v) To demonstrate to the student that their knowledge and abilities are valued and accepted.

(vi) To provide an opportunity for students to share ideas and expand their knowledge by building on each other’s

Characteristic of Brainstorming:

(i) It is an intellectual activity.

(ii) Maximum or all students can participate.

(iii) Each student gives their personal view/ideas.

(iv) Each idea is neither right nor wrong.

(v) It involves divergent thinking.

Advantages:

(i) It stimulated and provides varied instructional approach.

(ii) Highly motivating.

(iii) Increase task focus.

(iv) Promotes spontaneity and creativity.

(v) Efficient and procedure.

(vi) Involves participants in ownership of ideas.

(vii) Encourages creativity.

23.7. Laboratory Method

This method is one of the important methods of teaching science and it forms an integral part of effective science teaching. Under this method, teacher encourages the students to derive various scientific laws and principles on their own by getting personally involved in the experiment work. This teaching method encourages maximum senses of students.

For this, provision of a well- equipped laboratory is made by the teacher. Along with such materials and facilities, proper instructions are being provided by the teacher to the students by which they can carry out their experiments self-independently. They carry on the experiments and record the observation properly, on -the basis of which they infer their results or draw conclusions.

24. Some Specific Methods of Teaching

24.1. Team Teaching:

Team teaching is also called co-operative teaching. This is a recent idea in the field of education. According to M. B. Naik, 'In a team-teaching method, two or more teachers make a plan of the subjects cooperatively, carry it out, and always evaluate its effects on the students periodically'. **Features:**

(i) In team teaching, subject teachers give lectures to a big class.

(ii) All the members of the team have a common assembly.

(iii) They discuss the methods used by the follow-teachers.

(iv) Team teaching has the potential to develop the habit of supplementing the teaching of each other.

24.2. Micro Teaching:

Micro-teaching is an innovative teaching technique. It is a new development in the field of teaching.

Features:

(i) It is a teacher training technique.

(ii) It focuses on developing teaching skills.

(iii) It reduces the cases size in five or ten students.

(iv) The size of the topic is also reduced.

(v) It is a highly individualized training skill.

(vi) It provides feedback for trainee's performance.

(vii) It is an effective device to prepare competent teachers.

(viii) In this technique learners are provided with immediate knowledge of the correctness of response.

(ix) Micro teaching is most effective for the student-teacher after the practice teaching.

24.3. Dynamic Teaching:

The concept of dynamic teaching is inspired by one fundamental observation: The best way to learn is to get actively involved in the activities. Learning should not be passive (Nilson, 2010). We will see how dynamic teaching can be set up quite simply. The time has come to switch from a teaching centred on the actions of the teacher to a dynamic learning method, centred on the actions of the pupils. This means that the pupils are active, are involved in what they are learning. This implies adopting a whole new approach to a lesson so that they are not just waiting, not just listening. On the contrary, they must actively participate in different ways. They must read, write, discuss and take part in activities that force them to think. Role play and simulations, etc. can also be introduced.

Pupils will learn more effectively and they will have a better understanding of the key concepts of a lesson if they are pro-active and prompted to think through the use of dynamic strategies.

Features:

(i) Collaborative activities are an effective way to increase pupils' participation and interaction.

(ii) In the course of group activities, pupils feel more supported in their learning and have the impression of doing more things than if they were working individually.

(iii) Several strategies can be envisaged, depending on the objectives to be achieved. Some are simple to set up; in fact, you could already be using them.

(iv) The key is simply to alternate effectively between the traditional teaching times and the dynamic teaching times.

(v) Another difficulty is managing these exchanges between the pupils, so that they always remain effective.

(vi) Finally, some classrooms are not equipped to encourage collaborative work. It may be worthwhile revamping the classroom.

Sub Unit – 5

Teaching Support System

A sound education system is the prerequisite for the development of any nation. This is a well-known fact that our education system still relies on traditional methods and there is a need to combine the traditional teaching with modern teaching aids for a better and advanced education system. There is a difference in the opinion of the people regarding the use of traditional teaching methods and modern teaching methods.

Some people say that traditional teaching methods are best for imparting the education in the students while some favour that we should use modern teaching methods for giving quality education. In my view there is a need of maintaining the balance between the use of traditional and modern teaching methods. Both traditional and modern teaching methods should be used simultaneously for the betterment of education.

25. Traditional System

In most parts of our country traditional teaching methods are used in the educational institutions. In the traditional teaching method, teachers illustrate the concept to the students with the help of chalks and blackboard. Every important thing regarding the topic is written on the blackboard and students make important notes from the blackboard. After the lecture is over students revise their notes and try to memorise the notes. The main objective of traditional teaching is to pass the examination.

Merits of Traditional Teaching Methods:

(i) Traditional teaching method is cheaper than the modern teaching methods which make it more suitable in the schools of rural areas.

(ii) Some subjects like mathematics or chemistry are best taught on a blackboard as there is a need of explaining the concept at each every step.

(iii) There is more interaction between the teacher and student in traditional teaching methods as compared to the modern teaching methods.

(iv) In traditional teaching methods teacher does not require any special technical knowledge and can focus more on his subject for imparting the best knowledge to the students.

(v) Traditional teaching methods don't put any strain on the eyes of students whereas modern teaching methods can adversely affect the eyes of the students.

26. Modern System

From the last decade the use of high-tech equipment in the educational institutions is increased with a rapid rate. Now there are lots of modern gadgets which can be used for improving the teaching in the classroom.

Most Popular Equipment of Modern Teaching:

(i) **Use of Computers with wi-fi Connection in Classroom:** This is the most important tool of modern teaching methods. Teacher demonstrates the subject on his computer which is connected to the computers of the students through wi-fi connection. This type of teaching is seen mostly in the higher education institutions which have good infrastructure.

(ii) **Use of LCD Projector in Classroom:** Use of LCD screens in the educational institutions is becoming very common nowadays. Teacher prepares the power point slides and which are displayed on the LCD screen with the help of a projector. The projector can also be connected to a laptop/computer for displaying the relevant videos of the subject on the projector.

(iii) **Use of Interactive Whiteboards in Classroom:** Whiteboards are very interactive and provides the touch control of the computer applications. On whiteboard a teacher or student can draw, write or manipulate images so providing a very interactive and interesting platform. The main advantage of whiteboard is that it can show anything on it which can be seen on the computer.

The other less popular modern teaching methods are:

(i) Use of digital games in the classroom.

(ii) Use of special websites or blogs for teaching in the classrooms.

(iii) Use of microphones for delivering the lecture in the classroom.

Merits of Modern Teaching Methods:

(i) Modern teaching methods create more interest among the students with the help of interesting animation and videos.

(ii) Research has shown that use of visual media for teaching helps the students to understand the subject better and also helps students to memorise the concept for longer time.

(iii) With the help of modern teaching methods teacher can cover more syllabus in lesser time as they don't have to waste their time in writing on the blackboard.

(iv) Videos and animations used in the modern teaching methods are more explanatory than the traditional blackboard methods.

27. ICT Based System

Information and Communication Technology (ICT) in education is the mode of education that uses information and communications technology to support, enhance, and optimise the delivery of information.

Worldwide research has shown that ICT can lead to an improved student learning and better teaching methods. A report made by the National Institute of Multimedia Education in Japan, proved that an increase in the use of ICT in education with integrating technology to the curriculum has a significant and positive impact on students' achievements. The results specifically showed that the students who are continuously exposed to technology through education has better knowledge, presentation skills, innovative capabilities, and are ready to take more efforts into learning as compared to their counterparts.

Various Devices/Technology in ICT:

(i) Access of course materials through remote devices

(ii) Online digital repositories for lectures, course materials, and digital library

(iii) Online/ cloud based academic management systems,

(iv) Employing the flipped classroom concept,

(v) Making use of handheld computers, tablet computers, audio players, projector devices etc.

Why Measure ICT in Education?

Policy makers accept that ICT in education can help the students to compete in the global economy by being part of a skilled workforce and facilitate social mobility by:

(i) Enhancing learning experiences and providing new sets of skills

(ii) Reaching more students with Massive Open Online Courses (MOOCs)

(iii) Facilitating the training of faculties

(iv) Minimising costs and saving time associated with information delivery and automating regular day-to-day tasks

(v) Improving the administration of institutions to enhance the quality and efficiency of service delivery

Merits of ICT Tools:

(i) Through ICT, images can easily be used in teaching to improve the retentive memory of students.

(ii) Through ICT, teachers can easily explain complex instructions and ensure students' comprehension.

(iii) Through ICT, teachers can create interactive classes and make the lessons more enjoyable, which could improve student attendance and concentration.

Sub Unit – 6

Evaluation System

28. Concept of Evaluation

The evaluation process ascertains the workability of learning experiences and change of behaviour of the students. The term evaluation conveys several meanings in education and psychology. The evaluation is both quantitative as well as qualitative process.

29. Role / Function of Evaluation:

There are four main functions of evaluation:

(i) Evaluation helps to build an educational programme, assess its achievements and improve upon its effectiveness.

(ii) Evaluation plays an enormous role in the teaching-learning process.

(iii) It helps teachers and learners to improve teaching and learning.

(iv) Evaluation is a continuous process and a periodic exercise.

30. Desirable Characteristics of Evaluation

Comprehensiveness: It must try to assess all aspects of a child's development. Thus, different techniques might be used by the teachers to evaluate the performance of the child.

Continuous: Evaluation is a continuous process as education. It is not just an examination but a part of the evaluation process. There is no fixed time limit for the completion of evaluation work, but it is a continuous process.

Continuous and Comprehensive Evaluation (CCE) is based on the above two parameters. CCE helps in improving student's performance by identifying his/her learning difficulties at regular basis from the beginning of the academic session and employing suitable remedial measures for enhancing their learning performance.

31. Elements and Types of Evaluation

Development programs have to prove that they have had a strong and positive impact. Different types of evaluations are invaluable in showing the benefits of a program to backers, sponsors, and program beneficiaries.

In the past, measuring development programs involved pen-and-paper surveys and many people. This was inefficient, expensive and time consuming, and at times it resulted in inaccurate data. The results would often only be available after months.

Today, thanks to improvements in technology, monitoring and evaluation (M&E) has become digital. This has increased efficiency and accuracy while reducing costs, making it easier to conduct different types of evaluation at different stages of a program. Monitoring and evaluation personnel can now communicate the effectiveness of their program to partners, sponsors, program officers, and the community at large.

The best development project will conduct different types of evaluations, constantly looking to streamline their project or program at different stages and using different metrics.

31.1. Formative Evaluation:

Formative evaluation is used before program design or implementation. It generates data on the need for the program and develops the baseline for subsequent monitoring. It also identifies areas of improvement and can give insights on what the program's priorities should be. This helps project managers determine their areas of concern and focus, and increases awareness of your program among the target population prior to launch.

When:

- New program development
- Program expansion

What:

- The need for your project among the potential beneficiaries
- The current baseline of relevant indicators, which can help show impact later

Why:

- Helps make early improvements to the program
- Allows project managers to refine or improve the program

How:

Conduct sample surveys and focus group discussions among the target population focused on whether they are likely to need, understand, and accept program elements.

Questions to Ask:

- Is there a need for the program?
- What can do to improve it?

31.2. Summative Evaluation

Summative evaluation is conducted after the program's completion or at the end of a program cycle. It generates data about how well the project delivered benefits to the target population. It is useful for program administrators to justify the project, show what they have achieved, and lobby for project continuation or expansion.

When:

- At the end of a program
- At the end of a program cycle

What:

- How effectively the program made the desired change happen
- How the program changed the lives of program participants

Why:

- Provides data to justify continuing the program
- Generates insights into the effectiveness and efficiency of the program

How:

Conduct a review of internal reports and a survey for program managers and target populations. The aim should be to measure the change that the project has brought about and compare the change to the costs.

Questions to Ask:

- Should the program continue to be funded?
- Should the program be expanded? If so, where? What factors worked in its favor and what worked against it?

31.3. Process Evaluation:

Process evaluation occurs once program implementation has begun, and it measures how effective your program's procedures are. The data it generates is useful in identifying inefficiencies and streamlining processes, and portrays the program's status to external parties.

When:

- When program implementation begins
- During operation of an existing program

What:

- Whether program goals and strategies are working as they should
- Whether the program is reaching its target population, and what they think about it

Why:

- Provides an opportunity to avoid problems by spotting them early
- Allows program administrators to determine how well the program is working

How:

Conduct a review of internal reports and a survey of program managers and a sample of the target population. The aim should be to measure the number of participants, how long they have to wait to receive benefits, and what their experience has been.

Questions to Ask:

- Who is being reached by the program?
- How the program is being implemented and what are the gaps? Is it meeting targets?

31.4. Outcome Evaluation:

Outcome evaluation is conventionally used during program implementation. It generates data on the program's outcomes and to what degree those outcomes are attributable to the program itself. It is useful in measuring how effective your program has been and helps make it more effective in terms of delivering the intended benefits.

When:

- After the program has run for some time period
- At an appropriate time to measure outcomes against set targets – usually benchmarked time periods

What:

- How much the program has affected the target population
- Clearly establish the degree of benefit provided by the program

Why:

- Helps program administrators tell whether a program is meeting its objectives
- Insights from outcome-focused feedback can help increase effectiveness

How:

A randomized controlled trial, comparing the status of beneficiaries before and during the program or comparing beneficiaries to similar people outside of the program. This can be done through a survey or a focus group discussion.

Questions to Ask:

- Did participants report the desired change after the implementation of the program?
- What are the short or long-term results reported by participants?

31.5. Economic Evaluation:

Economic evaluation is used during the program's implementation and looks to measure the benefits of the programs against the costs. Doing so generates useful quantitative data that measures the efficiency of the program. This data is like an audit, and provides useful information to sponsors and backers who often want to see what benefits their money would bring to beneficiaries.

When:

- At the beginning of a program, to remove potential leakages
- During the operation of a program, to find and remove inefficiencies.

What:

- What resources are being spent and where
- How these costs are translating into outcomes

Why:

- Program managers and funders can justify or streamline costs
- The program can be modified to deliver more results at lower costs

How:

A systematic analysis of the program by collecting data on program costs, including capital and man-hours of work. It will also require a survey of program officers and the target population to determine potential areas of waste.

Questions to Ask:

- Where is the program spending its resources?
- What are the resulting outcomes?

31.6. Impact Evaluation:

Impact evaluation studies the entire program from beginning to end (or at whatever stage the program is at), and looks to quantify whether or not it has been successful. Focused on the long-term impact, impact evaluation is useful for measuring sustained changes brought about by the program or making policy changes or modifications to the program.

When:

- At the end of the program
- At pre-selected intervals in the program

What:

- Assesses the change in the target population's well-being
- Accounts for what would have happened if there had been no program

Why:

- To show proof of impact by comparing beneficiaries with control groups
- Provides insights to help in making policy and funding decisions

How:

A macroscopic review of the program, coupled with an extensive survey of program participants, to determine the effort involved and the impact achieved. Insights from program officers and suggestions from program participants are also useful, and a control group of non-participants for comparison is helpful.

Questions to Ask:

- What changes in program participants' lives are attributable to your program?
- What would those not participating in the program have missed out on?

Conducting an impact evaluation project soon? Use this ready-to-use survey template and get started in just a few minutes.

31.7. Goals-Based Evaluation:

Goals-based evaluation is usually done towards the end of the program or at previously agreed-upon intervals. Development programs often set 'SMART' targets – Specific, Measurable, Attainable, Relevant, and Timely — and goals-based evaluation measures progress towards these targets. The evaluation is useful in presenting reports to program administrators and backers, as it provides them the information that was agreed upon at the start of the program.

When:

- At the end of the program
- At pre-decided milestones

What:

- How the program has performed on initial metrics
- Whether the program has achieved its goals

Why:

- To show that the program is meeting its initial benchmarks
- To review the program and its progress

How:

This depends entirely on the goals that were agreed upon. Usually, goals-based evaluation would involve some survey of the participants to measure impact, as well as a review of input costs and efficiency.

Questions to Ask:

- Has the program met its goals?
- Were the goals and objectives achieved due to the program or externalities?

Development programs with effective monitoring and evaluation frameworks use different types of evaluation at different points of time. Some programs might even run two different types of evaluation at the same time for entirely different purposes. No matter what types of evaluation you use, we hope you find this blog useful in making your project and program more successful and efficient.

31.8. Diagnostic Evaluation:

Diagnostic evaluation refers to the evaluation procedure aims to diagnose the nature and degree of learning difficulties faced by the learner. It involves gathering information about learners' errors, nature of errors, possible reasons of errors, level of conceptual understanding and possible interventions to rectify the errors.

31.9. Achievement Test:

An achievement test is a test of developed skill or knowledge. The most common type of achievement test is a standardized test developed to measure skill and knowledge learned in a given grade level, usually through planned instruction, such as training or classroom instruction. Achievement tests are often contrasted with tests that measure aptitude, a more and stable cognitive trait.

Achievement test scores are often used in an educational system to determine the level of instruction for which a student is prepared. High achievement scores usually indicate a mastery for advanced instruction. Low achievement scores can indicate the need for remediation or repeating a course grade.

Characteristics of Good Achievement Test:

- It can be tried out and selected on the basis of its difficulty level and discriminating power.
- Directly related to the educational objectives.
- It should possess description of measure behaviour in realistic and practical terms.
- Contains a sufficient number of test items for each measured behaviour, concerned with important and useful matter, comprehensive, brief, precise and clear.
- It should be divided into different knowledge and skills according to behaviour to be measured.
- Standardized the items and made instructions clear so that different users can utilize it.
- It provides equivalent and comparable forms of the test.
- A test manual has to be prepared, which can act as a guide for administering and scoring.

31.10. Open Book Examination System:

An open book examination is an examination given in a course where the students are allowed to use certain resources during the test. This usually includes a textbook and lecture notes, but some will allow consultation of internet sources as well.

Characteristics:

(i) There appears to be less stress in studying for the exam because you technically don't have to memorize anything.

(ii) It is still important to know a lot of concepts.

(iii) It compels students to think.

32. Evaluation in Choice Based Credit System (CBCS) in Higher Education

The current education system in India is teacher-centric. Students in a particular field have to compulsorily study all the subjects regardless of their interest. This could lead to students losing their enthusiasm for studies and discontinuing their education.

The **Choice-Based Credit System** prevents this situation. It is a student-centric course which allows students to choose their subjects. The subjects can be at a basic or advanced level. Instead of the conventional marking system, CBCS system uses credits.

This system provides flexibility in preparing the curriculum and granting credits based on the course intensity and teaching hours. This helps students to pursue courses of their choice, study at their own pace, learn extra courses and acquire more than the required credits.

CBCS emphasizes on group discussions, assignments, class activities, and internal examinations thus creating a beneficial education environment.

32.1. Types of Courses:

(i) **Core course:** Students need to choose a core subject to complete the credit requirement.

(ii) **Elective Course:** These subjects have more generic content and aim to increase the students' skill. They expose the student to subjects which are not in their curriculum.

(iii) **Foundation:** They are value-based subjects that lead to knowledge enhancement.

32.2. Grading System:

The CBCS software grading system is uniform across all educational institutes. It follows the semester pattern and not the annual examination pattern. There are two semesters in every academic year-odd and even. At the end of every semester evaluation and the assigning of grades is done.

The credits grading system replace the conventional percentage system. University Grants Commission has introduced a 10-point grading system, with 0 being absent/fail and 10 being outstanding.

The number of hours a student attends the class also determines the credits.

32.3. How does CBCS work?

CBCS works on the simple principle of the choice being in students' hand. Colleges provide subject options to students. Students can choose subjects according to their interests and credits required for that particular semester.

They will then attend classes and practical's and obtain credits. Once they acquire the required credits, they pass the semester.

32.4. Benefits of CBCS System:

(i) CBCS allows students to choose subjects that they find interesting. Students perform better when they learn about things they like.

(ii) Students can take up varied subject combinations like economics-microbiology, physics-accounts, English-chemistry, etc. with the conventional education system this was not possible.

(iii) CBCS system prepares students for the future. Industries want employees who are all-rounders with multidisciplinary knowledge and not students with knowledge about just one stream. Thus, CBCS imparts job-oriented skills.

(iv) Students can change subjects every semester. This helps them to learn about various fields and recognize where their talent lies.

(v) As students choose their own subjects, they learn to make decisions which are beneficial for them. This helps students to become self-reliant at an early age.

(vi) CBCS offers students to study at different times and at different Institutes to complete a course.

(vii) As the grading system is the same across all universities in India, a student can easily transfer from one university to the other. Students in India have a uniform course.

(viii) If a student falls sick or is unable to cope, they can choose fewer subjects and earn less credit in one semester. They can then compensate for the lost credits in the next semester.

(ix) CBCS takes Indian education on par with global standards.

33. Computer Based Testing

Computer-based testing (CBT) has emerged as one of the recent 'innovative' approaches to assessments most pursued by states. CBT is lauded as the answer to having cheaper and

speedier test delivery for state and district-wide assessments. It is also seen by some as an avenue toward greater accessibility for students with disabilities. In this report we explore the context of CBT, current state computer-based tests, and considerations for students with disabilities, in part as follow-up to a similar exploration that occurred in the early 2000s when just a few states were beginning to develop and implement CBT for their state assessments.

33.1. Benefits of Computer-Based Testing:

1. Multiple-Test Administrations:

Learners can take multiple, short, reliable assessments administered throughout the life of an e-learning program.

2. Dynamic and Individualized Assessments:

Tests can be personalized and tailored to individual students. The level of difficulty of each question can be modulated depending on the learner's previous responses.

3. Immediate Grading:

Select-response tests (like multiple choice or True/False) can be scored instantly, allowing learners to instantly see how they did on an assessment and online instructors to make real-time instructional changes based on assessment evidence.

4. Helps with Open-Ended Assessments:

As any instructor knows, open-ended assessments (like portfolios or projects) that use rubrics are extremely time-consuming to grade. Simple rubric extensions, like Orange Slice or Google Sheets add-ons, automate scoring of rubrics and communication to students. This allows instructors to spend more time on feedback to students.

5. Feedback:

Voice feedback tools, like Kaizena, allow instructors to provide voice feedback which makes feedback both easier for the teacher and more personalized for the learner. In particular, video-based feedback can provide students with individualized and personalized feedback on performance.

6. Vertically and Horizontally Aligned Assessments:

Tests can be vertically aligned – anchored to test the same core knowledge at increasing levels of difficulty (criterion-based testing). They can also be horizontally aligned – scored in such a way that learners can be compared against one another (norm-referenced), which is critical for sorting and choosing students for teaching posts, scholarships, and so forth.

7. Value-Added Growth Measures:

Tests measure individual growth over time, so programs are able to benchmark where learners should be at the end of the year based on tests from the beginning of the year. All of these data can be analysed using statistical software packages so online programs can track learner growth over time.

8. Uncover Student Thinking:

Games and branching scenarios can help instructors 'uncover' student thinking and measure higher-order thinking skills. By having learners play content-focused digital learning games and using 'think aloud' protocols to explain their game-based decisions and rationale for such decisions, online program designers can design future learning experiences and assessments based that target specific learner competencies.

9. Engaging:

The use of quiz-based video programs, videos and video-notation tools and branching scenarios can make assessments more engaging than standard multiple-choice or essay tests.

10. Analytics for the Instructor and Learner:

Back-end data from LMSs, such as the number of log-ins, time on task, and number of discussion posts, can be linked to hard assessment data such as examinations or performance-based data to provide a fuller assessment of a learner's effort and progress in an online course.

11. Greater Amount of Test Items:

This is particularly important for high-stakes assessments that determine whether or not a learner graduates, moves to the next level, or receives certification. For such critical assessments, more test items are necessary than for low-stakes assessments. Computer-based assessments, because they draw from a back-end database of test items, typically comprise more test items than fixed paper-and-pencil exams.

12. Help Learners with Disabilities:

If computer-based assessments are universally designed, they may form less of a physical impediment to test taking than is the case with paper-based tests. For example, screen readers, magnification tools, and text-to-voice or voice-to-text applications can help learners with visual, auditory, and motor impairments; learners with dyslexia; and learners who simply need more time to complete a test.

13. Incorporate Other Types of Technology:

Computer-based or online assessments offer a wealth of authentic assessment opportunities for online learners, both synchronous and asynchronous, web-based and non-web-based, and multiple platforms (phone, tablet, and laptop).

14. Improves Writing:

Extensive writing via word processing or a digital writing tool – in which learners put forth a thesis statement, support their idea with evidence and supporting ideas, and come to a conclusion – has been shown to be better than writing by hand if learners go through the complete writing cycle of drafting, editing, revising, and rewriting (Warschauer, 2009).

34. Innovations in Evaluation Systems

Many people come into evaluation without formal training, or with training that does not provide a good understanding the range and scope of evaluation practice and theory. Sometimes, they claim that their approach is innovative when in fact it is well-established as good evaluation practice.

34.1. Invention, Bricolage and Translation:

It's worth thinking about different types of innovation. Some innovations in evaluation involve invention of new technology. The possibilities that big data present in terms of tracking events through social media or geo-tagging were simply not possible in earlier years when these technologies were not available. Some innovations are a bricolage, or a patchwork, of previous ideas and techniques brought together more coherently and used more systematically.

Some innovations involve borrowing ideas and methods from other disciplines and professions. Approaches to causal inference for evaluation have been imported from agricultural science, clinical trials, public health, political science, law and history. Different ways of doing interviews have been borrowed and adapted from anthropology and market research.

Some innovation is about learning from practice and thinking about a new role for evaluators. Rather than seeing evaluation (and the work of evaluators) as being something that comes along after a programme has been designed, and sometimes after it has been implemented, and trying to add value to later decisions, there is increasing interest in how the process of evaluation, and the work of evaluators and others doing evaluation, can contribute

to on-going improvements in implementation, and to improved planning and design up front. Real-time evaluation, developmental evaluation and positive deviance are examples of approaches to evaluation that support improved planning and on-going learning.

34.2. Worthwhile Innovation:

What sorts of innovation are actually new - and useful? Where innovation is most needed - and where is it a distraction from doing the basics well?

Good innovations add value. The growing interest in applying complexity ideas, for example, has arisen because they can help us understand and improve programmes and policies, not because they are trendy. Big data is becoming popular because it can provide insights not available through other means.

This means that innovation is likely to be most helpful where existing knowledge is not enough to do what is needed. Identifying these areas is therefore an important part of supporting effective innovation.

34.3. Supporting Innovation:

Innovation is hard. It is not always clear what should be done and, when applying something that hasn't been done before, we need to anticipate that it may not work. Supportive structures (and the right expectations) are needed for systematic experimentation and learning.

Two current projects illustrate some ways of systematically supporting innovation in evaluation.

The Australian Department of Foreign Affairs and Trade (DFAT) is supporting the Methods Lab, in collaboration with ODI and Better Evaluation. It is experimenting with a variety of methods for improving impact evaluation, developing and trialling materials to guide the selection and implementation of different methods.

The Office of Learning, Evaluation and Research (LER) in the Bureau for Planning, Policy and Learning in USAID has begun a process of experimenting with complexity-aware monitoring.