**Pedagogical Principles for developing best educational practices in the classroom**

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The educational process at every level of learning encompasses practices pertaining to both teaching and learning aspects. Every level of learning, starting from basic education to research and extension activities, follows a systematic approach to utilise the available resources to the maximum and give output to the stakeholders in the best possible form. Pedagogy lights the path of an instructor by suggesting age-appropriate strategies for transaction of knowledge and evaluation of learning outcomes.

A lesson plan is the instructor’s road map of what students need to learn and how it will be done effectively during the class time. Before planning a lesson, the instructor should first identify the learning objectives for the class. After that , the appropriate learning activities and strategies to obtain feedback on student learning can be designed. Thus a successful lesson plan addresses and integrates these three key components:

* Instructional objectives
* Objective-based teaching-learning activities
* Strategies for evaluation of learning outcomes

The present discussion pivots around the aforesaid key dimensions to elaborate on the essential pedagogic practices.

**Instructional Objectives**

The identification of the important objectives or the expected learning outcomes is very essential to build a basis to the structure of knowledge. The objectives selected for the instructional practices will provide the direction required to adopt the appropriate learning activities and also will guide the instructor to take up a corresponding set of evaluative practices.

The process of learning encompasses acquisition of concepts, development of attitudes, interests etc and grasping physical skills. Thus learning domains can be classified as Cognitive, Affective and Psychomotor. In 1956, Benjamin S. Bloom and his associates developed a theoretical framework that could be used to facilitate communication of content to the learners and to promote the exchange of test materials and ideas about testing with other examiners corresponding to the three domains of learning.

**i. The Cognitive Domain**

The cognitive domain involves knowledge and the development of intellectual skills (Bloom, 1956). This includes the recall or recognition of specific facts, procedural patterns, and concepts that serve in the development of intellectual abilities and skills. There are six major categories of cognitive processes, starting from the simplest to the most complex ,which are listed below .Verbs are used to involve students in thinking differently at each level. Verbs are identified below to clarify this point in understanding the function of the hierarchical way of thinking involving students in this process:

**Knowledge-** Recall of data

Action verbs associated with: Define, List , Name, Recall ,Recognize

**Comprehension-** Understand the meaning, translation and interpretation of instructions and problems.

Action verbs associated with: C*ite examples, Demonstrate, Discriminate, Identify, Choose*

**Application-** Use of a concept in a new situation or unprompted use of an abstraction

Action verbs associated with*: Interview, Solve, Experiment*

**Analysis** -separating material or concepts into component parts so that its organizational structure may be understood

Action verbs associated with: *Discover, Categorize, Survey*

**Synthesis-** Putting parts together to form a whole, with emphasis on creating a new meaning or structure

Action verbs associated with: *Compose, Construct, Create, Design*

**Evaluation-** Making judgments about the value of ideas or materials

Action verbs associated with: *Critique, Evaluate, Judge,* *Appraise*

**Bloom's Revised Taxonomy**

Lorin Anderson, a former student of Bloom, and David Krathwohl revisited the cognitive domain in the mid-nineties and made some changes, with the three most prominent ones being (Anderson, Krathwohl, Airasian, Cruikshank, Mayer, Pintrich, Raths, Wittrock, 2000):

* changing the names in the six categories from noun to verb forms
* rearranging them
* creating a set of Cognitive process and Knowledge dimensions

**The Revised taxonomy of cognitive objectives:**

Old Revised

Knowledge Remembering

Comprehension Understanding

Application Applying

Analysis - Analysing

Synthesis Evaluating

Evaluation Creating

**ii. The Affective Domain**

This domain includes the manner in which we deal with things emotionally, such as feelings, values, appreciation, enthusiasms, motivations, and attitudes. The five major categories listed in order are:

**Receiving**-awareness of information

**Responding**-regularity of responses

**Valuing**-adopting a value

**Organization**-developing a value system

**Characterisation**-consistent philosophy for life

**iii. The Psychomotor Domain**

The psychomotor domain includes physical movement, coordination, and use of the motor-skill areas. Development of these skills requires practice and is measured in terms of speed, precision, distance, procedures, or techniques in execution.

**Imitation**-repeating an activity

**Manipulation**-differentiating actions

**Precision**-acquisition of speed, accuracy and neatness

**Articulation**-ability for co-ordination

**Naturalization**-attaining perfection

The specific objectives and the action verbs associated with each domain provide directions with respect to the kind of strategies that can be used for transacting the content as well as for adopting corresponding evaluative strategies.

**Strategies for Evaluation**

The instructor should hold a variety of strategies to conduct objective evaluation with respect to the different types of performances by the students. All the strategies adopted to assess cognitive learning might not do justice in assessing a performance exhibiting psychomotor skills.

**The strategies for assessment of Cognitive performances include:**

1. Research Projects

2. Multiple Choice Questions

3. Debates

4. Seminars

5. Written Exams

**The strategies for assessment of Affective performances include:**

1. Interest Inventories

2. Attitude Scales

3. Autobiographical assignments

**The strategies for assessment of Psycho-motor performances include:**

1. Demonstrations

2. ICT-based performances

3. Lab-based Experiments

4. Kinaesthetic activities

The basic pedagogical principles required for a lesson will be the same for every learning experience. Every learning experience should be objective-based and it should be evaluated on the basis of the aforementioned instructional objectives. The approaches to lesson planning might take up changes based on the school of psychological thought it adopts to provide learning experiences. The approach to lesson planning was influenced mainly by two basic schools of psychological thoughts. They are Behaviourism and Cognitivism. It would be beneficial for the instructors if they imbibe the basic tenets of the theoretical highlights put forward by the stalwarts of these schools of psychological thought.

**Implications of Behaviourism and Cognitivism in Pedagogical practices**

When Psychology first emerged as a Science separate from Biology and Philosophy, the debate over how to describe and explain the human mind and behaviour began. The different **schools of psychology** represent the major theories within psychology. In the past, psychologists often identified themselves exclusively with one single school of thought. Today, most psychologists have an eclectic outlook on psychology. They often draw on ideas and theories from different schools rather than holding to any singular perspective.

The important Schools of Psychology can be listed out as follows:

* STRUCTURALISM
* FUNCTIONALISM
* BEHAVIOURISM
* GESTALT SCHOOL OF PSYCHOLOGY
* COGNITIVISM
* HUMANISM

The schools of psychological thought which is found to be most relevant for educational practices centred around a formal educational scenario will be emphasised as a part of this presentation.

The Structuralist school was mainly concerned with understanding the structure of mental processes and the functionalists were concerned with identifying the way in which the mental process functioned as a part of an individual’s personality. The significant contributions towards the analysis of teaching-learning process came from the Behaviourists and Cognitivists.

**BASIC IDEAS OF BEHAVIOURISM**

* Behaviourists were of the view that explanations for mental processing should be focused on observable behaviour exhibited by the organism (individual).
* They believed that the behaviour of an individual can be moulded through the manipulation of environmental factors.
* Every human behaviour can be explained in terms of S-R connections.(Stimulus-Response)

The major behaviourists are J.B.Watson, I.P.Pavlov, B.F.Skinner and E.L.Thorndike . Let us now analyse the educational relevance of the various theories developed by the behaviourists.

**1. Principle of Conditioning**

I.P.Pavlov developed the theory of classical conditioning and emphasised the concept of conditioning which is the process of deriving a natural response for an artificial stimulus by pairing natural stimulus with an artificial stimulus.

Teachers are able to apply classical conditioning in the class by creating a positive classroom environment to help students overcome anxiety or fear. Pairing an anxiety-provoking situation, such as performing in front of a group, with pleasant surroundings helps the student learn new associations. Instead of feeling anxious and tense in these situations, the child will learn to stay relaxed and calm.

**2. Laws of Learning**

The laws of learning suggested by E.L.Thorndike identify the basic aspects of learning to be adopted to ensure adequate learning experiences. The important laws of learning are:

**LAW OF READINESS**

“When a conduction unit is in readiness to conduct for it to do so is satisfying. When a conduction unit is not in readiness to conduct for it to do so is annoying. When a conduction unit is in readiness to conduct for it not to do so is annoying”

The law stresses the importance of creating a proper learning environment before transacting relevant content in a classroom.

**LAW OF EFFECT**

“When a modifiable connection between a stimulus and response is made and accompanied or followed by a satisfying state of affairs, that connection’s strength is increased; when made and accompanied or followed by an annoying state of affairs its strength is decreased”.

The law stresses the relevance of rewarding positive behavior to help in the establishment of proper Stimulus- Response connections which form the basis of behavior according to behaviorists. It also implies weakening wrong responses to given stimuli by presenting a negative feedback to the learner in the form of scolding, impositions, additional assignments etc .

**LAW OF EXERCISE [LAW OF USE AND LAW OF DISUSE]**

“When a modifiable connection is made between a situation and a response, that connection’s strength is, other things being equal increased” (LAW OF USE). When a modifiable is not made between a situation and a response during a length of time that connection’s strength is decreased” (LAW OF DISUSE).

The law suggests the importance of repetition of new learning experiences in the form of drill and practice to strengthen retention of new ideas. It also emphasizes the weakening of stimulus -response connections due to lesser frequency in the formation of connection between a stimulus and response.

**3. Theory of Operant conditioning**

B.F.Skinner introduced the idea of operant conditioning which presents a modification in the original S-R bond concept. Skinner stresses the importance of rewarding experiences occurring as the consequence of involuntary actions (reinforced stimulus) as the important stimulant to an individual’s response. The reinforcement given immediately after an action will motivate further actions from the organism.

The computer assisted learning programme which involves individualized learning opportunities traces its origin from teaching machines which were developed on the basis of this theory.

**BASIC IDEAS OF COGNITIVISM**

The term 'cognitive psychology' was first used by Ulric Neisser in 1967. Cognitive psychologists study internal processes that include perception, attention, language, memory and thinking. They ask questions like:

* How do we receive information about the outside world?
* How do we store and process information?
* How do we solve problems?

The cognitivist perspective has given rise to significant number of theories which explains the intricate cognitive functions. The most important of the theories are:

**1. The theory of intellectual development by Jean Piaget**

It explains the process of intellectual development in a human being and the various intellectual possibilities at each stage of development.

**2. The theory of Discovery learning by Jerome S.Bruner**

The theory put forward the learning strategy in which the students should be given opportunity to discover new knowledge by interacting with problematic situation rather than adopting the ideas presented by the teacher through a lecture.

**3. The Memory Model by Atkinson and Shiffrin**

It stresses on the process that happens inside the human mind and internal mental structure. The understanding about the psychology of processing and storage of information will help the teacher to process the content to be taught appropriately taking into consideration the position of the students.

**4. Ideas on Constructivism given by Piaget, Bruner and Vygotsky**

The central idea of Constructivism is that human learning is constructed. The constructivists stressed the importance of building up knowledge from the fundamental experience that a learner has about a particular concept. The social constructivist theory by Vygotsky stresses the importance of incorporating societal factors in learning process.

Thus the basics of Cognitive Psychology will be helpful to the instructor for:

* Developing the ability for problem solving in the learners
* Guiding in learning by discovery
* Suggesting memory enhancement strategies
* Encouraging project- based learning
* Ensuring involvement of community resources in learning
* Adopting collaborative learning techniques

Pedagogical principles are the fundamental points of orientation for professionals in educational contexts. They are maxims for action which facilitate the process of devising teaching strategies which, in turn, determine how pupils will experience, engage with and respond to content. Ideally, pedagogical principles should first be expressed in generic terms and then in terms specific to the actual learning environment. The pedagogical principles suitable to each level of learning ranging from primary school to higher education level act as scaffolds in providing an enlightening learning experience.

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