Chapter Four

*It is the supreme art of the teacher to awaken joy in creative expression and knowledge.* **Albert Einstein**

**Two pillars of effective Pedagogy: Creativity and Motivation**

Creativity in learning depends on direct active involvement in learning process and flexibility in teaching. Students participate responsibly in the learning process. The objective of this approach is to make students independent of teacher, that is, to liberate the learner from the teacher, the external agent and an impersonal body of knowledge. As Kneller (1971) puts it aptly, the success of this approach depends on liberating the learner from the tyranny of impersonal knowledge and from the personal tyranny of the teacher. The most useful learning in modern world is learning how to learn; a continuing openness to experience and an incorporation of the process of change into oneself are necessary goals of education.

Creativity, like intelligence, is one of those concepts that is much talked about but less understood. Creativity is a dynamic concept which changes its form and meaning according to interests, motives and approaches characteristic of the many investigators. Some view creativity as an ability that is separate from other abilities. While others view creativity as a ‘product’, still others view creativity as a ‘process’, leaving little room for agreement on the meaning of the term. St. Thomas Aquinas, the thirteenth century philosopher-theologian, defined ‘creation’ as “production in being by an efficient cause
without any preexisting subject.” This definition being theological, means that the product thus created is entirely ‘novel’, ‘original’, as a result ‘unique’. In the field of education, we are not concerned with creation in absolute sense that is, creating something out of nothing, as St. Thomas Aquinas might have meant, but rather with combining and recombining of already existing ideas or elements for newer uses. Creativity in education means ‘novelty’, ‘originality’, ‘divergence’, ‘giftedness’, ‘individuality’ which are related terms and are commonly described as idiosyncrasies. In modern times, a number of theorists have attempted to provide some working definitions of creativity. Three issues concerning the concept of creativity are apparent: (1) What is creativity? This involves questions of definition and criteria; (2) How does creativity occur? This implies questions of process viewed temporally; (3) Under what conditions is creativity manifest? In this are involved questions of necessary personal and environmental conditions.

Central to the idea of creativity is originality. This involves the ability to think in uncommon modes with clever, unique, and unusual concepts. Originality helps a person see remote and far-reaching consequences of what on the surface may appear to be small changes. There seems to be a close link between the concept of ‘originality’ and that of ‘novelty’. That something is original implies that it is new in some manner. Thus at the heart of the concept of creativity we find the notion of ‘newness’. Creativity results not in imitation, but in a new, original, unique and imaginative way of thinking about or doing
something. Although we frequently associate arts with the word “creative”, any subject can be approached in a creative manner.

Arthur Koestler, for example, has suggested that a creative process is the same whether the product is a painting or a postulate or a pun. Similarly, Abraham Maslow suggested that a good pie is better than a poor poem.

Many theories attempting to describe the creative process have been proposed. The major ones are reviewed by Busse and Mansfield (1980). Some view creativity as an ability that is separate from other abilities. Others view creativity as a cognitive process. Still others view creativity as a product. Most of the theories that Busse and Mansfield reviewed offer psychological rather than physiological explanations of creativity. Little is yet known about the neurological processes or structures relating to creativity, although there has been a great deal of speculation about left-hemisphere right-hemisphere issues. Besides, many of the theories, because of their vaguely defined concepts, are not easily testable.

**The Concept of Creativity According to Different Schools of Thought**

Researchers who follow psychometric tradition define creativity in terms of test performance (Torrance, 1966, Wallach and Kogan, 1965, and Guilford, 1967). Torrance’s Tests of Creative Thinking (1966) designed to measure divergent thinking abilities have often been used as measures of creativity. Divergent-thinking tests use problems that allow many possible solutions. One type of problem often found in these tests requires a subject to think of a large number
of ideas in connection with a new and unusual situation. For example, what would happen if people no longer needed to sleep?

On the basis of Guilford’s work, it is possible to view creativity as a process of divergent thinking. To be creative, then, means to think in divergent modes, to come up with numerous novel or unique meanings, new or original thoughts, to deviate or diverge from usual or conventional ideas. With results similar to Guilford’s findings, other advances in understanding creativity have been derived from the works of Anne Roe (1952), Donald Mackinnon (1962), and Frank Barron (1969). Creative people were seen as “inventive and industrious” (Mackinnon), “independent in judgment” (Barron), and as possessing “autonomy in judgment” (Roe).

For cognitive psychologists such as Jerome Bruner and David Ausubel know creativity as a process is structuring and restructuring of what is already known with the new. That is creation, creation of new meanings and insights, Cognition or knowing as a process involves adding new meanings and dimensions to the already known. Frank Smith (1985) argues that the brain’s primary mode of operation is the creation of world of ideas or experience in thinking, learning and communication. The basic argument is constructivist and hermeneutic, that perception and learning depend upon interpretation, and that interpretation is impossible without imagination and originality, two fundamental characteristics of creativeness.
For developmental theorists such as Jean Piaget, creativity is neither separate ability nor inborn. Every act of construction of knowledge is creation. In his words, “The development of intelligence is a continuous creation. Each stage in the developmental process produces something radically new, totally different from what was before” (Piaget, 1981). Howard Gruber (1981), who worked with Piaget for a time, has his chief interest in the study of creativity. His research focuses on the work of Charles Darwin and the process by which Darwin arrived at his Theory of Evolution. Gruber says that Darwin constructed the Concept of Evolution slowly, over many years of effort, while trying to sort out the meaning of variations in animal and plant life. Darwin did not come to any sudden ‘insight’.

This idea is also reflected in the following:

“Genius is one per cent inspiration, and 99 per cent perspiration.”-Thomas Edison

The heights by great men reached and kept were not attained by sudden flight,
But they, while their companions slept, were toiling upward in the night -H.W. Longfellow

Howard Gardner’s (1982 and 1983) three summary prerequisites for creative achievement in the arts or in any field are natural talent or genetic endowment, a responsive environment, and a heightened motivation or purposeful perseverance to excel.
Humanistic theories, based on the third force psychology, existentialist philosophies maintain that, to be human is basically to create, and to be creative one has to be free. Only a liberated person can be creative. Transcendence and immanence are basically existentialist notions. Creativity is fostered by having due regard both for transcendence and for immanence. Immanence and transcendence are intimately related. Immanence is the treasure deposited by the creative activity of transcendence. Abraham Maslow (1956) says, every human being has both sets of forces within him. One set clings to safety... hanging on to the past... afraid to take chances, afraid to jeopardize what he already has, afraid of independence, freedom, separation. The other set of forces impels him forward toward... uniqueness of self, toward full functioning of all his capacities... Safety has both anxieties and delights; growth has both anxieties and delights.

Erich Promm (1941) believed that the essential human freedom of the individual is the key to fulfilling personal needs. He argued that human progress has resulted in five basic needs that go beyond the biological needs of hunger, sex and thirst. The basic needs are a need for

1. Relatedness, to establish interpersonal relationships through love and understanding

2. Transcendence, to develop the uniquely human capacity of rational and creative thinking
Rootedness, to belong and become a part of the environment

Personal identity, to distinguish ourselves from our surroundings

Consistent orientation that allows us to understand ourselves and our environment.

Of these five needs, the second is directly related to our discussion.

Promm sees the creative possibilities of the individual as inseparable from his fellow men, and relatedness as the essential quality of human because men do exist in societies and cannot realize their possibilities their identifies except when their culture permits these developments. It is important to note here that, strictly speaking, there is no single on creativity per se. A number of theories are composites, in the sense they combine principles from different schools of thought mentioned.

Now, from the educational point of view let us have a re-look at the concept of ‘creation’ and ‘creativity’ in relation to ‘learning’. Creativity implies a novel response, and the response must be both new and useful. As (1956) puts it “Creativity is that process which results in a novel work is accepted tenable or useful or satisfying by a group at some point time”. The capacity to make novel responses is a characteristic of all members of species homo sapiens. Some of us generate more novel responses than others, and some of us generate better novel responses than others. A novel response is simply a response that a particular organism has made before to the same situation. The novel response, like all responses is determined by both environmental and organismic factors.
Environmental Determinants (Zeitgeist and Serendipity)

1. Zeitgeist, in German, means the total intellectual climate, the prevailing spirit of the times, and contemporary trends in thought or wisdom. There are many instances of simultaneous discovery which point to the influence of the zeitgeist. For example, the calculus was invented independently by three different people (Blaise Pascal, Isaac Newton, and G.W. Leibniz) at about the same time. The theory of the Origin of Species by means of selection was almost simultaneously presented by Charles Robert Darwin (1809—1882) and Alfred Russel Wallace (1823—1913).

Serendipity

Something accidentally while looking for something else (Serendipity is derived from Horace Walpole’s The Three Princes of Serendip, who wandered around the world, finding things they weren’t looking for). There are quite a number of such instances of accidental discoveries in science and geographical explorations. Serendipity is not just a ‘pure’ chance occurrence; it strikes only the prepared mind. “Chance favours only the mind that is prepared” (Pasteur). Newton’s Law of Gravitation, Archimedes’ Principle of Flotation, the discovery of radium by Marie Curie, and the discovery of penicillin by Alexander Fleming are some of the examples of serendipitous discoveries.
The zeitgeist can be identified with the accumulated body of information that constitutes a science. You assimilate the zeitgeist by reading available literature on the subject. Serendipity can be identified with one’s own unique life experience. To gain the maximum advantage of both personal experience (serendipitous knowledge) and the collective experience (established knowledge) of the scientific community gained through selective reading; it is more productive to consider a problem in the light of one’s own personal experience first.

**Organismic determinants**

Perseverance to assimilate the collective experience (zeitgeist) and flexibility take advantage of serendipity are the two characteristics of the creative mind.

1. Perseverance in education means disciplined inquiry and diligent study. The zeitgeist manifests itself only through the prepared mind that has assimilated it. The times were ripe for the theory of evolution, but only Darwin and Wallace were ripe with the times. Both had the perseverance to review the literature in order to be imbued with the spirit of the times, that is, zeitgeist. Darwin is honoured above Wallace, however, because he had the further perseverance to develop and document his novel idea. Here, necessity is not the mother of invention but the father. The creative mind is the mother of invention. Every new idea must have a mother and a father in the sense that every new idea is
a product of two old ideas. As the number of old ideas increases linearly, the number of potential new ideas increases exponentially.

Flexibility, that is, freedom to wander about and to explore is another, equally important, characteristic of the creative mind. A fallen apple, in the absence of a ‘prepared’ mind remains simply a fallen apple. But, for Newton, it opened a new frontier of knowledge. Archimedes had pondered over his problem for quite some time before he sat in his bathtub. However, it is futile to sit around in bathtubs waiting for inspiration to strike without shedding the preliminary perspiration.

In the light of the foregoing discussions on creativity and the creative mind, the traditional classrooms are seen as preparation of the young minds for the zeitgeist but not for serendipity, where perseverance is encouraged, flexibility is discouraged, and convergence is demanded, not divergence. What is needed is a balance between those two superficially tangential characteristics. Progress is possible only through the coordination of intelligent and creative thinking.

**Are Intelligence And Creativity The Same?**

Conceptual differences between intelligence and creativity can be synoptically analyzed now. While intelligence helps the understanding of the known by learning the predetermined body of knowledge, creativity helps revision of the known, the exploration of the undetermined and the creation of the new. While intelligence produces movement toward the usual expected, creativity tends toward the novel and speculative. The characteristic of intelligence, in the
process of knowing, is on the one hand, constriction and narrowing, while on the other, loosening and opening characterize creativity.

**Creativity and Learning**

Creativity implies a novel response to a situation. A novel response is simply a response that a particular individual has never made before to the same situation. The responses must be both new and useful. For cognitive theorists, ‘to know’ as a process, is construction and reconstruction of what is already known to the knower. That is ‘creation’—of new meanings and insights, and adding new meanings and dimensions to the already known. For the developmentalists such as Piaget and others, creativity is neither a separate ability nor inborn. “The development of intelligence is a continuous creation. Each stage in the developmental process produces something radically new, totally different from what was before” (Piaget, 1981). Learners have the capacity to combine and recombine ideas in novel ways because of the dominant flexibility and plasticity of mind.

**Teachers’ Role in Fostering Creativity**

The extent that creativity is essential to social progress as well as personal self-realization, schools should consider promoting creativity a matter of primary responsibility. Undoubtedly, the greatest single factor in promoting creativity is the role of the teacher. Even though we cannot expect every teacher to be a creative genius, all teachers should at least understand the nature and the special needs of the creative learner, and the processes of creative learning.
In a changed perspective of ‘teaching’ more dominant becomes less dominant, rigid becomes flexible, autocratic teaching becomes democratic teaching, repetitive learning becomes creative learning, and conformism and closure in curriculum leads to liberation and openness. The teacher/teaching dominant scenario changes to learner/learning scenario. Progress in our education can be achieved if and only if we try to move from the teacher led, teacher directed, passive learning state to the learner led, learning involved, active state. Thus moving away from the traditional scenario, teaching now means the following:

1. Creating environments for learners to learn.

2. Reaching more students and creating richer and more diverse environments for them to learn.

3. Helping students to discover (and sometimes rediscover) themselves, to make them independent and responsible learners, and reach their full potential.

4. A process by which teacher and pupils create a shared environment including sets of values and beliefs which in turn colour their view of reality.

**Versions of teaching**

Where individualism, community and collectivism start with the relationship of individuals to society and each other, and move from there into the classroom,
the six pedagogical values start with the purposes of education, the nature of knowledge and the relationship of teacher and learner.

- **Teaching as transmission** sees education primarily as a process of instructing learners to absorb, replicate and apply basic information and skills.

- **Teaching as initiation** sees education as the means of providing access to, and passing on from one generation to the next, the culture’s stock of high-status knowledge, for example in literature, the arts, humanities and the sciences.

- **Teaching as negotiation** reflects the Deweyan idea that teachers and students jointly create knowledge and understanding rather than relate to one another as authoritative source of knowledge and its passive recipient.

- **Teaching as facilitation** guides the teacher by principles which are developmental (and, more specifically, Piagetian) rather than cultural or epistemological. The teacher respects and nurtures individual differences, and waits until learners are ready to move on instead of pressing them to do so.

- **Teaching as acceleration**, in contrast, implements the Vygotskian principle that education is planned and guided acculturation rather than facilitated ‘natural’ development, and indeed that the teacher seeks to outpace development rather than follow it.
Teaching as technique, finally, is relatively neutral in its stance on society, knowledge and the learner. Here the important issue is the efficiency of teaching regardless of the context of values, and to that end imperatives like structure, economic use of time and space, carefully graduated tasks, regular assessment and clear feedback are more pressing than ideas such as democracy, autonomy, development or the disciplines. This approach, incidentally, is not the proud creation of the DfES Standards Unit, but has its origins in the Didactica Magna of Jan Komensky (Comenius), first published in 1657.

First, they help us to escape from the universal but debilitating tendency to see pedagogy in terms of simple dichotomies: didactic / exploratory, traditional / progressive, formal / informal, telling / discovering (and, for that matter, egocentric / sociocentric). Second, they offer the alternative, and historically more attuned idea of pedagogical layering, hybridization and indeed contradiction.

The idea of repertoire can be extended infinitely, down to the finest nuance of discourse. But to make it manageable, we concentrate in the first instance on three broad aspects of pedagogical interaction: organization, teaching talk and learning talk.
Organizing interaction

The organizational repertoire comprises five broad interactive possibilities reflecting our earlier distinction between individualism, community and collectivism, or learner, group and class:

- \textit{whole class teaching} in which the teacher relates to the class as a whole, and individual students relate to the teacher and to each other collectively;

- \textit{collective group work}, that is group work which is led by the teacher and therefore a scaled-down version of whole class teaching;

- \textit{collaborative group work} in which the teacher sets a task on which learners must work together, and then withdraws;

- \textit{one-to-one activity} in which the teacher works with individual learner

- \textit{one-to-one activity} in which learner work in pairs.

Teaching talk

The teaching talk repertoire comprises the five kinds of talk we observed in use across the five countries in the international study. First, the three most frequently used:

- \textit{rote}: the drilling of facts, ideas and routines through constant repetition;
- **recitation**: the accumulation of knowledge and understanding through questions designed to test or stimulate recall of what has been previously encountered, or to cue students to work out the answer from clues provided in the question;

- **instruction / exposition**: telling the student what to do, and/or imparting information, and/or explaining facts, principles or procedures. These provide the familiar and traditional bedrock of teaching by direct instruction. Less frequently, but no less universally, we find some teachers also using;

- **discussion**: the exchange of ideas with a view to sharing information and solving problems;

- **dialogue**: achieving common understanding through structured, cumulative questioning and discussion which guide and prompt, reduce choices, minimise risk and error, and accelerate the ‘handover’ of concepts and principles.

**Learning talk**

The third repertoire is the learner’s rather than the teacher’s. It constitutes not how the teacher talks or organises interaction, but how the learners themselves talk, and the forms of oral expression and interaction which they need to experience and eventually master. This *learning talk* repertoire includes the ability to:
Alongside four contingent abilities which are vital if learners are to gain the full potential of talking with others:

- listen
- be receptive to alternative viewpoints
- think about what they hear
- give others time to think.

Learning talk repertoires such as this and others are clearly possible, depending on how one conceives of human development on the one hand and the curriculum on the other – are often missing from discussion of classroom interaction. Because the teacher controls the talk, researchers tend to start and finish there, focusing on teacher questions, statements, instructions and
evaluations and how learners respond to them, rather than on the kinds of talk which learners themselves need to encounter and engage in.

**Principles of Dialogic Teaching**

So far we have a view of classroom talk which requires the judicious selection from three repertoires – organization, teaching talk and learning talk. Now we come to the heart of the matter. I submit that teaching which is dialogic rather than transmissive, and which provides the best chance for learners to develop the diverse learning talk repertoire on which different kinds of thinking and understanding are predicated, meets five criteria. Such teaching is:

- **collective**: teachers and learners address learning tasks together, whether as a group or as a class;

- **reciprocal**: teachers and learners listen to each other, share ideas and consider alternative viewpoints;

- **supportive**: learners articulate their ideas freely, without fear of embarrassment over ‘wrong’ answers; and they help each other to reach common understandings;

- **cumulative**: teachers and learners build on their own and each others’ ideas and chain them into coherent lines of thinking and enquiry;

- **purposeful**: teachers plan and steer classroom talk with specific educational goals in view.
It is enlightening, for example, to take a look at pedagogic transmission in terms of:

1. how clearly the teacher worked with the subject in its own pure terms or allowed everyday forms of understanding a place within the lesson;
2. how clearly the subject discipline is separated off from, or integrated with, other subjects;
3. how clearly the specific sections of the subject discipline are separated off from, or integrated with, each other;
4. how much influence the teacher allows the learners in terms of selection of knowledge in the classroom;
5. how much influence the teacher allows the learners in terms of sequencing the lesson;
6. how much influence the teacher allows the learners in terms of pacing the lesson;
7. how much influence the teacher allows the learners in terms of assessment strategies in the lesson.

These variables can be clearly separated off, analyzed and used to build modalities of pedagogy, but once we had done this analysis we still wanted to know:
The difficulty with concentrating on how the pedagogic message is transmitted is that the poor quality of the message itself gets lost in focusing on the modalities of pedagogy.

Pedagogical content-knowledge is the whole range of teaching knowledge and skills that teachers acquire to be able to communicate pedagogical content. It involves subject and generic-education teaching skills. Subject pedagogical content-knowledge includes those teacher- and student-based teaching strategies and techniques which could be used solely for teaching particular subjects. For example, the Audio-lingual Method, a didactic teacher-based teaching strategy, and Communicative Language Teaching, an active-learning
and student-based teaching strategy, are used exclusively in teaching languages. On the other hand, generic-education pedagogical content-knowledge includes those teacher- and student-based teaching strategies and techniques which could be used for teaching almost all subjects. For example, the Lecture Method, a didactic teacher-based teaching strategy, and Cooperative Learning, an active-learning and student-based teaching strategy, are cross-subject teaching strategies (Shawer, 2009).

**Motivational Factors in Learning**

**What is Motivation?**

Motivation, a general psychological term is used to explain behaviour initiated by needs and directed toward a goal. The word motivation derived from the French word mouvoir (v) meaning to move; to stir; prompt. Motivation refers to the question of why behaviour takes place. It a diffuse concept and is often associated with other factors such as interest, attitude, need, value, aspiration and incentive that energize and direct behaviour towards a goal.

**The Factors of Motivation**

An interest is a preference for one activity (or subject) over another. Interests are always positively directed and are usually more active than dormant. A person usually likes the things in which he is interested, or the hobbies he pursues. Interests are acquired in early childhood or may develop even later.
Interest and attention are interrelated, in that students with interest in a subject tend to pay attention to it.

An attitude means an outlook and a tendency, preparedness or readiness to respond in a favourable or an unfavourable manner to particular people, objects, concepts or situations. Thus, the individual is either positively or negatively oriented towards certain social institutions, nation, religion, caste, class, race, language or a political organization. Attitudes carry a strong emotional component, and therefore can never be neutral. They are also broader in scope and comparatively more passive. Attitudes involve some knowledge of a situation. They are not static, rigid entities. If we are to change them, we must change their emotional character. In order to do this, we may find it useful to change the knowledge and the ideas related to them through discussion and argumentation.

Attitudes are important determiners of behaviour. Both interests and attitudes are learned behaviour, in that they are not inherited or genetically endowed. A distinction can be made between interests and attitudes, although admittedly the two terms are not entirely independent. For example, one may have an interest in gardening and a positive attitude toward plants and flowers in general. A person may have an interest in reading but have a negative attitude towards certain authors.

Need refers to the lack of something, biological and/or psychological, in a person. A student who comes to know or realize that he lacks something and
that he needs it, is likely to strive for attaining it, for example, ‘need for achievement’, ‘need for recognition’, ‘need for affiliation’, ‘need for dominance’, and the like. Whatever the motives be, studies suggest that people who feel a need for achievement are usually oriented toward the future and set long-term goals. Interestingly, they tend not to set extremely unattainable goals for themselves. Instead, they aim at moderately difficult goals that they have a realistic chance of reaching. Parents and teachers must be careful not to goad the children by saying, “Dream; dream; achieve your dreams”, “Aim high; aim high”, “Hitch you wagon to the stars”, and so on, but to help them “aim right” by setting the realistic goals in terms of their potential. What is important is the students must be helped to identify their potential and needs (not ‘wants’), and then endeavour to fulfill their needs.

A student’s aspiration or motive is his hope or longing for a certain kind of achievement. With a certain level of aspiration, the student will try; without it, he will make little or no effort. An incentive is something the student perceives as having the capability of satisfying an aroused motive. It draws the student to action aimed at acquiring the incentive. The student motivated by curiosity has understanding or knowledge as his or her incentive. If ‘achievement’ is the motive, then success, honour or good grades will serve as incentives. Often, the very sense of progress in learning serves as an incentive to the learner.

Now, having discussed adequately the attendant factors of learning, the IQ aficionados probably would raise their eyebrow at the glaring absence of the concept of intelligence. Intelligence tests and intelligence quotient are the
present-day educational buzzwords. Contrary to previously held beliefs, intelligence, as measured by standardized tests, does not grow and unfold on its own, nor is it a necessary condition for successful learning. Its growth is not genetically predetermined. It is the educational impact of the environment on the child’s inherent cognitive capacity which results in the abilities and skills called intelligence. Normal physical and physiological growth, healthful social and psychological environment, and enriched learning experience are likely to facilitate intellectual growth.

Learning does not seem to occur during sleep or in an unconscious state. Learning with the intention to learn (that is, purposeful learning) is more efficient than learning when the intention is absent.

According to the psychological interpretation, learning is a process continuum (ranging from surface level to deeper level) spanning three distinct stages of knowing—perceiving, comprehending, and learning. These three are not mutually separate stages of knowing. Even to have sense perception, we need comprehension, and often, comprehension precedes and aids perception. Hence comprehension is central to sense perception and learning.

In perceptual knowing, the things perceived or identified may remain as isolated entities in short-term memory unless and until the perceiver finds interrelationships between and among these isolated pieces of information. To understand means to unify what we know, to see how it all fits together. The very process of comprehension seems to involve drawing together all that we
know into a unity, into a coherent whole. Thus, comprehension seems to be the process as well as the product of unification, and so is holistic, and not fragmentary. It is important to note that ‘comprehension’ does not mechanically follow ‘perception’. In fact, comprehension initiates perception; it aids and directs perception; and it ends in the virtual learning. It cannot leave the perceiver in a state of confusion forever.

Now, a step beyond, is learning. The very process of learning entails comprehension, confirmation, consolidation and expansion. In simpler terms, comprehension means understanding or making sense of what is perceived. It is a process of seeking cognitive clarity, a process of reducing cognitive uncertainty. Confirmation means verification, rejection or modification and acceptance of what is perceived (in Piagetian terms, ‘adaptation’). Consolidation means greater structuring of what is known. This is similar to what Piaget calls ‘organization.’ And, expansion refers to expanding the learner’s experience, knowledge and the symbol system (that is, language as an instrument of cognition), and deepening the understanding. Expansion simply means further learning, that is, extending the boundaries of what is known by exploring the territories of the unknown. Thus expansion as a process includes adding new meanings and dimensions to the known. The cognitive procedures that include conceptualizing, hypothesizing predicting, remembering and evaluating help the learner learn better.

Comprehension and expansion are more or less coterminous but not synonymous. Learning encompasses and integrates all the four. Comprehension
without expansion leads to a state of cognitive stagnation—educationally inane and useless. Expansion without comprehension is absolutely meaningless. It becomes mere accumulation of information and a strain on memory Ausubel’s (‘rote learning’). Expansion becomes useful and meaningful only when confirmation and consolidation processes are complete Ausubel’s (‘meaningful learning’).

In other words, real learning involves understanding of what is known. Comprehension or understanding of what is known is the basis of true learning. Any learning without understanding is drudgery. But all that is understood cannot be real and permanent learning. What we usually mean by learning are those more or less permanent changes brought about voluntarily one’s patterns of thinking, feeling and acting. Learning is a personal matter. Learning, in order to be permanent, should arise only out of the learner’s own experience, needs, interests and beliefs. Also, genuine learning has to have a purpose.

It would not be a productive enterprise to describe and discuss the topic “Learning” without adequately considering the related areas: “the learner”, object of learning” and “the learning situation”. Of course, the teacher, teaching, however crucial, only form a part of the learning situation. The learning situation includes physical setting with human, social and psychological factors. No doubt, the teacher is one element, rather the most important element, in the whole situation. Therefore, when we discuss the focal topic “learning”, do it in conjunction with other factors.
Learning = F (Learner + Curriculum + Teacher + Situation)

Learner Characteristics and Learning Variables

This includes learner motivation or learning readiness. Variables such as learner’s felt need, curiosity, attitude, interest, sensitivity, attention focusing ability, physical and mental health form the learning ability of the learner. Learning variable includes the task involvement; sense of progress made and so on. Achievement task means the endpoint for which the learner is preparing (for example, class test, selection examination, class debate, group discussion, class presentation, and so on).

Teacher and Teaching Variables

This includes variables such as teacher’s personality, teacher’s attitude towards teaching, towards the subject matter and the students, teaching approach and style, whether it includes demonstration, direct instruction, guidance, approval, encouragement, evaluation and further direction. There is a tendency among teachers to be overly concerned with the curricular and the pedagogic matters, and to ignore the learner, learning process and the learning problems. Pedagogy must be derived from pedology. The most important thing is that the teaching style of the teacher must be congruent with the learning style of the learner, not vice versa.
Conditions for Successful Learning

To say that learning takes place when the comprehensibility or the learn- ability of the subject matter (jneya) matches the comprehension or the learning ability of the learner (jnathr) would be too simplistic. Based on the foregoing discussions we can conclude that learning becomes natural, personal and successful, if and only if the following conditions are fulfilled.

Interest

Learning involves not only a person’s cognitive behaviour but also his affective or non cognitive behaviours such as interests and attitudes. It is not enough if one has a high interest towards a subject, he has to have a positive attitude towards learning that subject. Interest is a reciprocal criterion variable, in that, if the learning object is capable of captivating the attention of the learner, the learner is likely to evince interest in the object. If the learning object is capable of sustaining learner’s curiosity and attention, and cognitively inviting and challenging, it is likely that the learner tries to pay attention to it, and to that extent learning is said to be successful. The learner is likely to focus attention on the subject matter if it is neither too easy and simple, nor too difficult and complex from the learner’s point of view. For the learner to get hooked to the learning task, the learning object must be tempting, inviting and challenging, giving the learner a feeling of “Yes, I can. I did it yesterday, I can do it today.”
Need

Every human action is in response to a need (biological or emotional or intellectual). This is an epistemological explanation of ‘equilibrium’ (cf. Piaget), not a bare stimulus—response explanation of human behaviour. If the learning object is found to be useful or need based, in that it is capable of satisfying the learner’s felt needs, the learner is likely to pay attention to the subject matter. Learners, children in particular, are more concerned with the present and the immediate needs. They are only concerned with “now and here,’ and do not care for the needs of the distant future. In Maslowian terms, the lower order or basic needs are to be either fully or partly met before the higher order or meta needs. Physical or biological needs must be fulfilled before the psychological needs. Immediate needs take a priority over the distant or remote needs.

Comprehensibility

Learning takes place if the learning object is cognitively relatable, in that it is capable of being subsumed and assimilated (cf., Piaget, Bruner, Ausubel). The thing to be learned must have internal consistency and lend itself to cognitive structuring. Put in simpler terms, the learner must be able to make sense of it. Comprehensibility of the subject matter is a reciprocal phenomenon between the learner and the subject matter. Also included in this condition is the language of learning/teaching and classroom communication. Learning can be personal and meaningful if it takes place in a familiar and clear language.
Functional

The subject matter can be meaningful if it is found to be capable of application, in that it is capable of being remembered, recalled and applied in newer situations. Put in simpler terms, the knowledge that is already constructed must be useful in understanding newer things better. Again, the practicality and usability of the things learnt depends on the question of immediacy, that is, now and here.

Pleasure

According to Maria Montessori, “One test of the correctness of educational procedure is the happiness of the learner.” Learning can be successful if the very act of learning is capable of providing pleasure and reduce pain including fear of failure and punishment. Here pleasure means a sense of achievement and success. Physical and mental drudgery, monotony, boredom, drill and meaningless repetition, all add up to pain. The role of external rewards and punishment is irrelevant and untenable. In fact, the reward of learning is learning itself. Getting hooked to genuine learning itself is a pleasure. The reward lies in the unforgettable moments of learning, and in the little steps of progress attained.

Situation

Finally, for learning to be successful, there should be an ambience or atmosphere conducive for learning. An empathetic and facilitating teacher,
cooperative peers, and an encouraging and supporting learning environment which is free from fear and angst, all make up a congenial social climate. This, coupled with a comfortable physical atmosphere, offers an ideal context for learning. Now, to illustrate this further, an analogy can be drawn between the process of learning and the six conditions being the wheels on which the wagon moves. For a free, smooth and frictionless progress there has to be a synergy among these conditions. Obviously, learning will be most effective when the cluster of factors interact positively and operate conjointly. Sometimes, learning may take place even if one or two conditions are not met (or partially met).

A teacher should motivate learners to become independent and as a result creative. We as teachers tend to focus upon every other aspect of teaching-learning as against creativity. Any pedagogy should have its roots in creativity which unfortunately is what is lacking. Creativity is neglected and treated as if it has nothing to do with learning. Our curriculum should focus upon creativity and develop a pedagogy wherein we can develop independent intellectual minds.

Pedagogy depends on certain strategic questions which have to be addressed in order to allow the learner to make progress. In our case, by motivating them to be creative.

While developing an effective pedagogy, one needs to look into the following aspects.
Needs Assessment - What learning is needed by this class?

- What do I leave out?

- How do I introduce a skill, a concept or some information so that it sticks?

- How do I assess the results?

- Standards?

- What choices do I have?

- How do I coordinate all of this?

- How do I build independence?

What is my backup plan?

What might be a good replacement strategy?

Resource Management - How do I make do with what we have?

Coordination - How do I orchestrate all the different aspects of pedagogy?

These are some of the questions to be addressed while discussing Pedagogy of teaching-learning. All the mentioned aspects should be taken into account by keeping creativity in learning at the center.


