"Creative children are assets to the Society. Development and progress in various fields of national life depends on creative children. Creativity is not restricted to the chosen few. All children are creative and its dimensions vary from child to child."

- ALI IMAM
CHAPTER : II
THEORETICAL PERSPECTIVES

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CHAPTER : II
THEORETICAL PERSPECTIVES

2.1 INTRODUCTION:-

Education in our country as well as in other countries is facing a grave crisis these days. In fact, education does face a crisis everywhere during the transitional period of social changes. In creative role of creative innovation in our rapidly changing society can not be overstated since our cave-dwelling ancestors discovered first and chiseled their first tools, the study of civilization has been a panorama of the effects of new ideas upon the health, safety, comfort, education, convenience and entertainment of man. But even in view of such advances in science and heart transplants, colour television, atomic reactions there is no reason to believe that the development of such extra-ordinary creations will decrease. In fact, with such modern tools as computers, electron microscopes and solidstate electronic devices, the rate of innovation should continue not only help to compensate the loss suffered due to incomplitable environment at influence but also help to develop our destiny of course it may involve rare or conflict between education and our ability to keep ahead creativity.

According to Alex Fosborn. "The invention at automatic energy was a spectacular triumph at human imagination."

It is also important to note that the scientists, politicians, industrialists, writers, artists, and researcher of the future are currently in our schools. Present educational practices typically fair or foster creative growth. They perhaps even stifle in imagination of our learners.

To know the meaning of creativity, the concept of creativity defined by various psychologists are worth to be noted in the forthcoming chapter.
2.2 THE MEANING OF CREATIVITY

Creativity is currently a very popular subject in educational and psychological circles. There are so much confusion surround the term creativity that it is most difficult to discuss and use it. Creativity could not fetch a single definition. The main reason is that different thinkers consider it in different views. The definition of the word 'creative' offered by 'Fowler's modern English usage' reflects this impression very precisely. He comments that:

"Creative is a term of praise much affected by critics. It is presumably intended to mean original or something like that but is preferred because it is more value and less usual."¹

It has been called a "Luscious round meaningless word" and said to be so much in honour that is the term of approval from the school room to the advertiser's studio.

It is true that the creativity is to be studied scientifically, it must be defined in a way that permits objectives, observation and measurement.

But mackinnon is cautious against accepting any single definition of creativity as final he defines:²

"Definitions of creativity range all the way from the notion that creativity is a simple problem solving to conceiving it as the full realization and expression of all of an individual's unique potentialities. One would be ill-advised to seek to choose from among the several meanings the best single definition of creativity. Since creativity proper carries all of these meanings and many more besides creativity is indeed a multi-faceted phenomenon."

This multi-facetedness of creativity has read researcher to a variety of approaches for studying creativity resulting in various theories in points of view about creativity and has created certain
conceptual dimension.

Approaches to the study of creativity differ from person to person, emphasizing one aspect or the other, but enough light has been thrown on the subject to recognise creativity, as a mental ability or 'many' splendoured thing which warrants varied way of expression and development.

A analysis of fifty definitions of creativity was done by Rhodes (1961) who indicated four stands of creativity: person, process, press and product. Systematic investigator, in the field of creativity, has used either or a combination of these four stands of creativity and the definition of creativity and the definition of creativity that one has given around that aspect.

Creativity in short is a quality which each human being is capable of exhibiting in his living. Individuals differ, however, as a result of both nature and nature in the amount and kind of creativity they display. Furthermore, more creativity can be enhanced in most individuals and thus can increase in our society as a whole if we put into practice in education.

Creativity is discussed from each of these points of view briefly under the following captions.

2.3 FOUR COMPONENTS OF CREATIVITY

Four components of creativity are usually known as creativity as 4 P's. These four p's are very important to know the fundamental idea of creativity. Psychologists view the creativity from different dimensions. Hence it will be better to discuss the term creativity from different points of views, namely from psychological traits of 4p's viz.

(1) Person
(2) Process
Now we study these four components regarding with creativity as under.

2.3.1 Person

Psychologists, clinicians and the factor analysts have shown much interest in defining creativity in terms of traits.

Hallman R.J.'s psychometric method has identified in the creative ability. Such traits as originality, ability to transform meaning and ability to elaborate. A.H. maslow believes that the healthy and self actualizing persons will be creative. And he adds that creative personality is spontaneous, expressive, effortless, innocent unfrightened by the unknown or able to integrate opposites and able to accept tantativeness and certainly able to tolerate. From speaks of only four traits as under:

1. Capacity to be puzzled
2. Ability to Concentrate
3. Capacity to accept conflict
4. Willingness to be reborn every day.

2.3.2 Process

John Dewey (1910) was first man who thought of creativity as process. He emphasized only mental functioning and point out the following steps in typical problem solving. These creative thoughts can be put up by following creative process
Difficulty is felt → Difficulty located and defined → Possible Solutions

A Solution is accepted ← Consequences are Considered

**Figure 2.1 DEWEY MODEL.**

After this model Graham wallas (1926) suggested another model with four steps. According to wallas the process of creativity is a mental functioning. The steps are as under:

Preparation → Incubation

Verification ← Illumination

**Figure 2.2 WALLAS MODEL.**

At that time spearman supported wallas and he thought of certain as purely a process (1930). For him creative thinking is the process of creative relationship with conscious or sub-conscious processes operating. But Rosman (1930) opposed their view. He suggested that the word 'incubation' is not proper because it shows the condition or a state of mind rather than a psychological operation.

Hence he defined the process of creativity having seven steps as shown in the figure No.2.3 to follow:
The creativity components like Guilford and Torrance also believed the creativity as a process. When Guilford defined divergent thinking as "The process of hypothesis forming testing and result Communication." His view became clear on the basis of definitions of Torrance. The creativity is defined by Yamamoto (1964) as "The process of forming new ideas or hypotheses testing theses ideas and communicating the results."

All these definitions lay stress only on the working within the psyche of the man or a creation.

2.3.3 Press:

Press menas an interaction between human being and their environment. Manslow proved to be a pioneer to define creativity involved a fundamental change in personality structure and that this chance occurs in the direction of fulfilment. But the basic idea of Maslow can be traced back in the Freudian considerations of neunotic etiology. Freudian view holds that sublimation of repressed unconscious wishes of the pregential urges and of libidinl urges determine creativity. Vinacks has defined creativity as:
"An integrated harmony between external world reality and individual's internalized need."\(^{10}\)

Such definatizations emphasizing press clearly identify "Openness to experience" as the main basic.

2.3.4 Product -

When we are confronted with the question, "What is the measure of creativity?" The answer is as follows:

"The product which the creative individual makes" is the real measure greater and newer the products, better the creativity.

Measure of creativity is nothing but "the output of a person after an input of a problem" in machine language.

All these views give the idea of creativity as a measure or a product. In the third decade of this century, Alder defined creativity as "a compensatory product of the interiority drive." In the fourth decade Sharpe defined it as "a product of distinctive drive and unconscious wishes that aspire to become immortal."

Psychologist Westheimer and Maslow also thought of creativity in terms of product. Guilford's exploration of indicators of creativity through factor analytical studies showed fluency, flexibility and originality as measurable units and it is only through these that we talk of creativity in psychological measurement.

2.4 FLOW CHART OF CREATIVITY -

Same investigators appear to regard the phenomenon of creativity as a single dimension of personality. Guilford thinks that the creative disposition is made up of many components and that its composition depends upon where you find it. The definition of creativity as a product supports above assumption. In the field of psychology and multi-dimensional aspect can be measured by the most scientific technique.
of factor analysis. Being a multi-dimensional aspect, creativity too can be measured by factor analysis. On the basis of an aptitude project of Guilford and his associates, the components of creativity are available. 

Those factors are further subdivided into groups. This can be very well understood by the chart mentioned here:

**FIGURE : 2.4 FLOW CHART OF CREATIVITY COMPONENTS**

Each of the factors of the above Components will be explained in detail as under:

2.4.1 Fluency :-

It refers to a fast flow of ideas and tendencies to change directions and modify information. It is a quantitative representation of an individual. It is subdivided into the following sub-components:

(1) **Ideational Fluency :-**

It is a production of ideas where free expression is encountered and quality is not evaluated. The idea produced may be as simple as a
word as complex as the title for a picture or story or as phrases and short sentences that convey unitary thoughts.

(2) **Associational Fluency :-**

It pertains to the completion of relationships, in distinction from the above factor of fluency, which involves giving ideas that fit a class. This ability is obviously of use to a creative writer, who wants to find quickly a variety of verbal expression without the use of dictionary.

(3) **Expressional Fluency :-**

It refers to the spontaneous production of new ideas to fit a system or a logical theory. Thus, this factor of fluency also restricts the areas of new ideas like associational fluency.

(4) **Word Fluency :-**

It is concerned only with words. It is the generation of words which is required specially.

2.4.2 **Flexibility :-**

It is one type of readiness of change behaviour to meet changing circumstances. It shows in how many different ways a person can respond to a stimulus.

It identifies the produced ideas in a number of classes of objects which are represented as responses of a stimulus. It is subdivided further into two factors :

(1) **Spontaneous Flexibility :-**

It shows how fast a person can change the group or how divergently one can think. For the scoring of the flexibility of a performance in terms of the number of items, one changes the category of the uses of the given thing is encountered.

(2) **Adaptive Flexibility :-**

It is some divergent transformation quality which involves
changes.

2.4.3 Originality :-

It is related to the uncommon responses or unusual different things in a strange way. Thus newness along with usefulness is necessary for originality factor.

2.4.4 Elaboration :-

It is related to the variety of implications. The expanding and combining activities of higher thoughts is necessary here, which shows a production of detailed steps, variety, of implications and consequences.

Recent investigation of creativity factors by Indian scientists chauhan and Tiwari gives eight factors of creativity. Four as discussed in the above paragraphs and four new factors. All the eight factors are listed below:

1. Creative Production.
2. Fluency.
3. Originality.
4. Flexibility.
5. Ingenious Solution to problems. (ISP)
7. Sensitivity to problems.
8. Redefinition.
2.5 **CREATIVE LEARNING AND ENRICHMENT MODELS:**

If creative learning and problem solving are essential components of an effective development programme and are important aspects of effective instruction material for the students, then what models would guide the school teachers of educators? Here three stage model provides the guidelines for instructional practice.

**The Three Stage Model:**

Feldusen and Kolloff (1978) developed a creative environment model which stresses the development of basic thinking, skills, cognitive strategies and independent learning in gifted children.

2.5.1 **First Stage:**

Stage one activities in the model are designed to teach basic divergent, convergent and emagination activities and to foster basic language and mathematics skills.

2.5.2 **Second Stage:**

Stage second is concerned with fostering broader strategies using convergent divergent evaluation and cognitive skills. The gifted students assume some more self-direction in these activities.

2.5.3 **Third Stage:**

Stage third introduces gifted students to independent project activity in which they can use their basic skills and abilities, information acquired through reading and listening and cognitive strategies taught.
in stage two to develop facility in self direction. The teacher now assumes the resource role. The students plans and conduct their own investigation inquiry or project. The goal is to develop increased capacity for such self direction, self motivation and use of creative skills.

**FIGURE: 2.5**

**THE PURDUE THREE-STAGE MODEL**

**STAGE-I** DEVELOPING BASIC DIVERGENT AND CONVERGENT THINKING SKILLS AND AFFECTIVE RESPONSES
TEACHER LEADS SHORT TERM ACTIVITIES:
EG: Fluency, flexibility, originality, elaboration, logic critical thinking, values clarification, self understanding.

**STAGE-II** DEVELOPING HIGHER LEVEL COGNITIVE STRATEGIES WORK-STUDY PRODUCTION SKILLS, STUDENTS TAKE MORE INITIATIVE.
EG: Creative thinking, problem-solving, research methods, library skills, time management, interviewing, inquiry techniques, writing.

**STAGE-III** DEVELOPING INDEPENDENCE IN RESEARCH AND CREATIVE PRODUCTION STUDENTS TAKE INITIATIVE
TEACHER SERVICE AS RESOURCE PERSON AND GUIDE
EG: Experimental research writing reports, formal presentations, extended synthesis projects, creative performances.
2.6 ENRICHMENT TRIAD MODEL

Renzulli and Smith (1981) developed the Enrichment Triad Model. The three levels of enrichment activities are illustrated in Fig. 2.6. The enrichment triad model emphasizes the need for students to have variety of exploratory experiences and to learn to use many basic skills of critical and creative thinking, in preparation for interest-centred involvement in the investigation of real problems at a very high level of complexity and challenge.

ENRICHMENT TRIAD

General  Group  Individual
Exploratory Training Activities
Activities  Group

Figure 2.6 ENRICHMENT TRIAD MODEL

2.6.1 General Exploratory Activities

The first type of Enrichment Triad model is usually known by "General Exploratory Activities." It gives students opportunities to 'sample' a variety of topics outside the regular curriculum. It may involve such activities as guest speaker field trips or films or media presentations or work with interest development centres in classrooms.

2.6.2 Group Training Activities

The second type enrichment triad model is often known by "Group Training Activities." It provides opportunities for learning, inquiry and methodological skills involves teaching students 'Process' skills including methods of problem-solving, thinking skills research or inquiry method of a general nature and method of research that are specific to disciplines in which students are particularly interested.

2.6.3 Individual and Small Group Investigation:

The third type of Enrichment Triad Model is usually known by...
Figure 2.6 Enrichment Triad model (Renzulli, 1977)

Type I
General
Exploratory
Activities

Type II
Group
Training
Activities

Type III
Individual & Small Group
Investigations of Real
Problems

Regular Curriculum

Environment In General

Figure 2.6 Enrichment Triad model (Renzulli, 1977)
individual and small group. It uses for students to become 'producers' of knowledge.

Thus it places a strong emphasis on defining a real problem formulating and original solution developing a product and sharing the results or products with appropriate guidance. It involves a problem for which the students has considerable motivation and emotional investment. Type third opportunities arise from the students involvement and personal commitment to solving a particular problem in an effective and creative way.

2.7 CREATIVE THINKING MODEL

Treffinger (1980) has presented a model of creative learning that involves three levels of sequential stages. Which is illustrated in Fig. 2.7. The model emphasizes that creative learning involves with a cognitive and affective dimension.

Students thinking and feeling process must be considered as teachers plan ways to enrich their learning in creative ways.

2.7.1 Creative learning model

It is defined as three-levels. They are shown here below

First Level : Divergent Functions

Second Level : Complex thinking and feeling processes

Third Level : Involvement of real challenges.

These three levels are explained in detail as follow:

2.7.2 First Level : Divergent Functions

First level is usually known as "Divergent Functions." In this level, students learn to use the basic tools that will enable them to work successfully with complex reasoning and problem solving task. It includes many enjoyable and popular activities such as brainstorming attribute listing. They can be easily related to many content or subject matter topics at a variety or grade levels.
Figure 2.7 Creative learning model. Treffinger, D.J. Encouraging Creative Learning for the Gifted and Talented. Ventura, CA: Ventura County Schools/LTI, 1980.
2.7.3 **Second Level: Complex Thinking and Feeling Processes.**

Second level is called "Complex thinking and feeling processes". At this level students learn and practice more complex methods and systems for creative thinking and problem-solving.

2.7.4 **Third Level: Involvement in Real Challenges.**

Third level is known as "involvement in real challenges." At this level, students develop confidence and competence in dealing with real problems and challenges. Real problems viewed in Treffinger's model are those for which the students have a great deal of personal concern or involvement. In the description of ownership of a problem, Treffinger has emphasized three criteria:

1. **Interest**
   - The criteria 'interest' involves whether you want to do something about the problems.

2. **Influence**
   - Influence consists of whether it is possible for you to take action on the problem.

3. **Imagination**
   - Imagination involves whether you are really searching for new or creative solutions.

Treffinger's creativity learning model emphasizes the need for gradual or systematic development of creative thinking and problem-solving skills through carefully desired instructional or enrichment programmes.
2.8 CREATIVITY DEVELOPMENT TECHNIQUES

Creativity can not be taught as a process but by developing situations that demand imagination, Originality and problem solving. The children are more likely to be creative under this chapter, investigator describes in brief some techniques for developing creativity viz. Brainstorming Attributes listing, morphological Analysis, Check list of questions synetics and some special programmes.

2.8.1 Brain Storming.

The principles of brain storming described as Alex F as born 14 are as under.

1) Differ evaluation during the phase of producing ideas, especially evaluation of a negative critical kind.

2) Quantity begets quality. The more ideas are generated. The higher probability of hitting upon some brilliant ones.

3) The more fantastic the ideas, the better it will be. A fantastic idea one that does not seem at all a practical idea-serves the important function of demolishing conventional patterns of thinking while the idea itself may not be practicable, it may trigger other ideas that might not only be novel but also useful.

4) There is no reason to feel ashamed in building or other ideas or one's own previous ideas. In other words be open to suggestive power of others or one's earlier ideas.

Brain storming generally is done in groups, it can be done by individuals. Brain storming is not useful as a technique where the problem has a unique solution that can be reached by analysis. On the other hand, brain storming is particularly useful for problems that can have multiple solutions of which some may be better than the others.

Brain storming is not very useful unless the topic selected for brain storming is specific. It the topic vague, the brain storming
will carry different frames of reference and the ideas generated will have a diffused applicability.

During brain-storming the leader should encourage the panelists to provide concrete suggestions or ideas rather than abstractions or good intentions. These concrete ideas stimulate hitch-hiking and action orientation. They have on energy charge that abstraction back.

Brain storming leads to many ideas. After these ideas are generated it is often necessary to identify a few ideas for more intensive investigation. One useful technique is to have each number of a panel vote on the potential of each ideas for solving the problem at hard. Some times the ideas can be grouped into classes and then each idea within a group may be voted upon. Sometimes it may be useful to formulate the criteria for assessing the potential a the ideas initially generated before the ideas are voted upon.

That is to say, ideas voted the best in the initial round of voting may again be put to a vote to get a small number of high potential ideas. These ideas may then be taken up for much more intense scrutiny.

Brain storming is not only a technique, it is a culture. Its clear message is that for divergent thinking atleast, a democratic and collaborative culture works.

During brain storming session people drop their defensiveness, and instead of competing for power and status, they compete for the excellence and creativity of their ideas. Brainstorming reinforces a sense of participation, especially if brain storming is followed by voting on the best ideas. Participation increases commitment to implement the participatively chosen course of action. Finally, brain storming increases self-confidence and a sense of resourcefulness. It provides a clear demonstration of the power of the
human mind to overcome obstacles.

The implication of using brainstorming for decreasing authoritarianism in collectivities ranging from the family to industry, government and educational institutions.

After high potential ideas are selected it may be useful to form task forces for developing each idea. Each task force may be requested to prepare for management in say, a month a brief report that assesses the potential of the idea, an operational plan to make the idea work, some inestimable costs and benefits and administrative other steps that may be needed to discuss and execute the innovation. This way, a large number of persons get a chance to participate in the introduction of innovations.

2.8.2 Attribute listing

Attribute listing is a useful technique for designing or redesigning a specific product or service or activity. The technique was developed by Rebert Crawford.\(^{15}\)

According to Crawford, magic inspiration is not the only even major source of creativity. Much creativity arises from changing the attributes of an object or an activity or from grafting on to the object or activity and attribute or attributes some other object or activity.

In attribute listing, the attempt first is made to list the basic but modifiable attributes or properties or specifications of a particular object or activity. Then an attempt is made to generate alternatives to the current attribute or specification.

Very often it may be useful to list abstract attributes of a concrete object or activity. This may help in generating more ideas than if the concrete attributes are listed.

Crawford has summarised the principles of attributes listing as under:
(1) Creation is not inspiration alone, it is largely adaptation and experimentation.

(2) Creation is not just mechanically combing different products or ideas.

   It is useful modification of an attribute, or assimilation of attributes of other things.

(3) In trying to modify the current attributes of an object, it is desirable to search for concrete alternatives.

(4) Creativity can be systematised by looking first for closely related substitutes of the current attributes of the object, and then progressively going in for more and more far out alternatives.

(5) Creation is not just stealing of ideas. It is continuing stream of modification suggested by idea in use which result overtime in greatly charged products or objects.

   more specific the object or activity one wishes to change, given by attribute listing. Also it helps to separate the modifiable from the unmodifiable attributes of the object and to concentrate one's attention on the modifiable attributes. A useful procedure is to list exhaustively all the obvious attributes of an object or activity, such as the current size, colour, shape, function, weight, major components, material etc. For an object and current duration function, steps, sub-programmes etc, for an activity. Next it is desirable to identify some of these attributes that can possibly be altered without destroying the main function of the object or activity.

   Next the alterable attributes may be stated or more abstract, general attributes. Asking what functions these attributes perform, and how critical these functions are to be main use of the object or activity would not only help in listing necessary attributes in abstract terms, but also help one in fixing priorities of attributes and in encouraging
one to look for alternative ways of satisfying functional requirements.

2.8.3 Morphological Analysis:

Arnold has suggested that there is one basic difference between attribute listing and morphological analysis. Attribute listing works best when the product, object, activity sought to be modified is very specific. On the other hand morphological analysis can also be applied profitably to modify general objects or activities. Obviously, when attempting to use morphological analysis for generating fresh ideas about a class of object, the more fundamental attributes listed for generating alternatives and the more off-beat the alternatives that are considered the alternative designs that emerge are likely to be more interesting.

Attribute listing and morphological analysis are not merely techniques like brainstorming, they embody important creativity favouring attitudes and values. The chief such value is one of tinkering or trying out a new combination. This makes for an experimental, innovative bent of mind. It also alerts one to possible new applications of ideas.

2.8.4 Checklist of Questions:

People generally regard speaking the truth as a good thing. Questions as somebody put it, are the creative acts of intelligence for often they emerge diverse thinking. Somebody who asks "Is it?" triggers a somewhat frantic scramble for the justification of this widespread belief. Whether or not it ideas one to the conclusion that truth is not a good thing. It is likely to clarify more than before what we mean by truth, what is good about it and what is not so good about it, the circumstances under which it may be good and the consequences of truth and falsehood.

A variety of questions can invention or improvement.
Alex Osborn has illustrated the power of questions in leading individual to inventions improvement. Some of the more powerful questions that can improve an object or an activity are:

- What can be added to an object to improve it?
- What can we substract or delete from it without damaging it?
- What can we alter in it?
- Can we rearrage its components?
- How can we adapt the object for use other than the present one?
- Can we magnify the object greatly?
- What could be the opposite properties?
- Can we minify or miniatures the object?
- Does the object have uses than the present one?
- Are there new ways of utilising the object?
- Are there alternative ways of producing the object?

Like brainstorming and attribute listing, questions checklist also incorporates important creativity enhancing values. The chief one is dissatisfaction with the status. The habit of questioning everything is indispensable if our culture is to be innovative one. Imagine what would have happened if this habit of questioning, so prominently displayed in the Upanishads, has been sustained later in Indian History.

The resurgence of the west after fifteenth century is mainly because it recaptured the Greek spirit of enquiry and put it to practical use.

2.8.5 Synectics:

The word 'synectics' has been adapted from the Greek word 'synecticos'. Which means fitting together diverse elements. This technique was founded by a brilliant thinker named William J.J. Gordan
and it was Co-founded by George Prince. It is a very remarkable technique of group problem solving and to a non-initiate. It looks like a mad method for finding solutions. This may look like methods, but there is a method to it.

The founders of Synectics have devised systematic ways of ascending to and harnessed the preconscious. They have found out that 'to do' is to imitate the process of incubation in the preconscious mind. Incubation is the phrase of problem solving in which the pre-conscious mind is working out the solution of a complex problem without the conscious mind does not think logically, it thinks analogically, associatively, visually.

The principal mechanisms used in Synectics for solving problems are the use of several different kinds of mind stretching analogies, and a good deal of fantasizing.

Types of analogies:

1. Direct analogy
2. Personal analogy
3. Fantasy analogy
4. Symbolic analogy

These four types of analogies are explained in detail as under:

2.8.5.1 Direct Analogy

Direct analogy involves seeking a direct comparison of the phenomenon under discussion with some other phenomenon that is similar enough.

2.8.5.2 Personal Analogy:

The attempt here is at a particular kind of empathising the person is asked to retain his individual human sensibility, but is simultaneously asked to transpose himself into a situation and to report
what he feels, sees, hears, thinks etc.

2.8.5.3 Fantasy Analogy :-

In this, the group members are urged to image a constraining free solution, in much the same way as our wish fulfilling day dreams. Group members are urged to fantasize same perfect solution even if it flies in the face of known scientific principles.

2.8.5.4 Symbolic Analogy :-

The symbolic analogy is also called book-title. In this the leader may take a key-word under discussion and ask group members to come upon with a short provocative phrase that the essence of the word under discussion but such that it is aesthetically satisfying or paradoxical.

George Prince has described the structure of the synectics process. Synectic flow chart is given in figure No 2.8 :

The general steps are described as under :

2.8.6 General steps of structure of the synectics process :

(1) Problem As given (PAG)
(2) Analysis
(3) Purge
(4) Problem As Understood (PAU)
(5) Evocative Question (EQ)
(6) Examination (Exam)
(7) Force Fit (FF)
(8) View Point (VP)
(9) Excursion

These general steps of structure of the synectics process are explained in detail as under :

2.8.6.1 Problem as Given (PAG)

A general statement of the problem to be solved as it may
FIGURE: 2.8
SYNECTICS FLOW CHART

PROBLEM AS GIVEN (PAG)

ANALYSIS EXPLANATION BY EXPERT

PURGE

GENERATION OF PROBLEMS AS UNDERSTOOD (PAU)

CHOICE OF PROBLEM AS UNDERSTOOD (PAU)

EVOCATIVE QUESTION (EQ)
FOR EXAMPLE

CHOICE OF EXAMPLE

EVOCATIVE QUESTION (EQ)
FOR PERSONAL ANALOGY (PA)

EVOCATIVE QUESTION (EQ)
FOR BOOK TITLE (BT)

CHOICE OF BOOK TITLE (BT)

EVOCATIVE QUESTION (EQ)
FOR EXAMPLE (EX)

CHOICE OF EXAMPLE (EX)

EXAMINATION OF EXAMPLE

VIEW POINT (VP)

FORCE FIT (FF)
have been given to the group members by an outside source or as generated by themselves.

2.8.6.2 Analysis:

An explanation of the problem by the expert, making the strange problem familiar. This should be in enough detail so that there is an understanding of the problem but since the expert will be a participant he need not try to make every one as knowledgeable as he is.

2.8.6.3 Purge :-

The universal response to the statement of a problem is "How about solving it this way?". We have found it constructive to encourage people to air these immediate solutions. In some cases they are good in view point and if not, as the expert explain why the suggestion would not work every one understand the problem better.

2.8.6.4 Problem As Understood (PAU)

After the PAU has been explained each participant writes a restatement of the problem as he sees it a goal. He believes, it would be desirable. It is useful to write several 'PAU' which imply different approaches to the problem. We tell participant to bear free to wish for any thing one can image, even if it violate laws they know hold true.

2.8.6.5 Evocative Question (EQ)

This is a question that requires an analogical or metaphorical answer. We have 'EQ's that produce three different kinds of analogy.

(a) Example (Direct analogy)

(b) Evocative Question (EQ) for personal analogy(PA)

(c) EQ for book title. (Symbolic analogy)

2.8.6.6 Examination. (Exam)

It is customer in this step to examine actually a selected
example, to play with one of the examples. Two sorts of facts are produced.

(1) Descriptive facts about the examples.
(2) Super facts statements that are more speculative and strange.

2.8.6.7 Force Fit (FF)

Although the analogical mechanisms lie in the heart of the synectics method they must be "Force Fitted" to the problem, if they are to be effective through the strain of this new fit the problem is stretched and pulled and refocussed in order that it may be seen in a new way. It no deliberate attempt is made to find relevance in apparent irrelevance, then one analogy can merely lead to another and another, and potentially fruitful view points will be bypassed. A 'Force fit' suggest new context and thus provides the raw material for new lines of speculation.

2.8.6.8 View point (VP)

"Give me a place to stand" boasted Archimdes "And I can move the world." In synectics this "place to stand" is the material as the examination stronge angles from which to view the familiar facts of the problem. A usefully strange example can suggest not one but many different potential solutions or view prints. One of the basic difference between the synectics method of operation and traditional problem-solving procedures is that the later seeks solutions, synectics seeks new lines of speculation and these in turn lead to potential solution by means of the 'Force Fit.'

2.8.6.9 Excursion

A team describing the synectics procedure from selection of PAV through 'Force Fit.' If no new view print is developed, another "Excursion." is being developed through all or part of the procedure
that is sometimes new examples can be made to the same 'EQ' or a new 'EQ' may be used; or when FF reveals a new aspect to the problem, a new PAV may be stated.

Synectics is group-technique and it thrives on the divergent of its members. The role of the leader is not to set an agenda or assess member's contributions on assess and announce the consensus. His role is rather that at keeping group members stimulated by shifts in focus through calling for different kinds of analogies. Also he has to be good at sensing a solution and calling for a 'Force Fit' at the right time. His role is that of building up a cerebral charge so that an illumination can become highly likely. For this to happen, he may not only ask for various kinds of analogies. But he may also encourage group members to play with words, laws and metaphors to achieve strange perspectives, try to invert perspectives for example, by suggesting that it is iron that attracts the magnet rather than, vice-versa, repeat inconvenient laws of nature and so farther.

Synectics is not merely a technique for solving different problems. It may also be a powerful technique for training people to become more flexible and original. And of tolerate ambiguity and irrelevance. Practice with synectics tends to make and mind supply, capable of rapid and breath taking shifts of focus, a capability that may considerably increase originality.

2.9 **NATURE OF CREATIVITY**

Nature of creativity depends upon sometimes, cultural influences has seem an important role in nurturung creativity. In educational system, Torrance suggest following cultural influences which are crucial for nurturing creative talents.

(1) Success orientation
(2) Peer orientation
(3) Sanctions against questioning and exploration
(4) Misplaced emphasis on sex roles
(5) Divergency equated with abnormality
(6) Crucial teacher skills.

These cultural influences are explained in detail as under:

2.9.1 Success Orientation

Success orientation, when greatly over emphasized is determine to creative growth because creative learning involves experimenting taking risks, making mistakes and correlating them. If making errors is forbidden and they are severely punished children soon give up all hope of success and stop trying to learn to nurture creativity, teachers may have to modify their concepts of classroom success and permit children to succeed first in ways possible to them and use the resulting growth to motivate them to higher levels of creative functioning. There is a strong need for more ways in which children can succeed in school.

2.9.2 Peer Orientation

Teachers can do much to lighten the tyranny of the group pressures that inhabit creative development. In creative problem solving experiences respect can be developed for unusual, minority ideas. Ability and interest groupings can lighten these pressures for many children. Arranging for appropriate sponsors or patrons for promising young star can be very powerful. The child who start earliest in his special efforts has the best chance of developing to the highest level in his field. Sponsors can give promising young stars a chance to develop in creative ways at an early age.

2.9.3 Sanctions against Questioning and Exploration.

Teachers generally recognise the need for children to ask
questions and inquiry about the wonder and mysteries about them, such tendencies frequently and squelched.

2.9.4 Misplaced emphasis on sex role

Schools can do the reduce the tyranny of this misplaced emphasis. Boys and girls in different ways suffer in creative development for society's misplaced emphasis on sex role differences. One way is through activities that approve independence in thinking and judgement as well as sensitivity and receptiveness other way is organizing various kinds of Co-curricular activities.

2.9.5 Divergency equated with abnormality

Teachers should be alert to look at behaviour disapproved by the norm group for signs of creative potential. Such potentialities may not occur in the kinds of behaviour valued by the schools, atleast not until recognised and given intelligent guidance and direction.

2.9.6 Crucial teacher skill

Almost any penetrating analysis of what is required for successful nurturance of creativity lead to a recognition of the need for helping teacher improve certain skills. Torrance outlines a series of in-service teacher work shops designed to improve skills which are crucial for nurturing creativity which are listed below:

(1) Recognizing and acknowledging potentialities.
(2) Being respectful of questions and ideas
(3) Asking provocative questions
(4) Recognizing and valuing originality
(5) Developing elaboration ability
(6) Unevaluated practice and experimentation
(7) Developing creative readers
(8) Predicting behaviour
(9) Guided planned experiences
2.10 OBSTACLES TO CREATIVITY

As creative capacities can be deliberately controlled but only be encouraged they can be easily inhabited. Ralph J. Hallman identifies nine common barriers to creative imagination which are listed and explained as under:

1. Pressure to conform
2. Authoritarian attitudes
3. Ridicule
4. Rigidity of Personality
5. Rewards
6. Quest for certainty
7. Over emphasis on success
8. Hostility toward the divergent personality
9. Intolerance of the 'Play' attitude

2.10.1 Pressure to conform

The pressure to conform is perhaps the major inhabiter of creative responses. This pressure may take the form of teacher-chosen goals and activities standardized routine and tests or on inflexible curriculam.

2.10.2 Authoritarian attitudes

Authoritarian attitudes and environment repress the creative potential of young people. They inhibit learning to be free, learning to be self directive and self-responsible. Education by authority directs students to learn what others have already discovered, what other believe, what other have organized. Authoritarian education places emphasis on following directions, doing what one is told, and on
solving problem which have fixed and predetermined answers.

2.10.3 Ridicule

Ridicule and similar attitudes destroy feelings of self-worth in students and therefore have a tendency to block off creative efforts. Domination of pupils for any reasons, treats of any kind of fears which may be engendered for failure to obtain right answers or to know the proper information dissipates any creative tendencies which may be latent.

2.10.4 Rigidity of personality

Those traits which make for rigidity of personality inhabit creative expressions. Those traits may vary from psychopathic conditions to be unconsciously learned habit which simply annoy others. Inflexible defense mechanisms and compulsive fears on the part of teachers.

2.10.5 Rewards

An over emphasis on such rewards as grades arouses defensive attitude on the part of pupils and to that extent threatens inventiveness. Perhaps all forms of evaluation which are external to a given situation defer the productive tendency, including even criticisms.

2.10.6 Quest for certainly

An excessive quest for certainly stills the creative urge. This habit is instilled by teachers who demand the right answers, who insist on what they themselves want in the way of responses, who demand the predetermined solutions. These attitudes are extended by students into other affair and express them selves in the forms of demands to know what is right with respect to dress, what clubs to join and what otherwise will be socially acceptable things.

2.10.7 Over emphasis on success

An over emphasis on success drains off energies from
creative processes and focuses them upon outcomes, perhaps upon some status symbol or on the merely instrumentally valuable goods which might have been achieved such over emphasis blocks creativeness because it has the tendency to direct attention away from growth and from continued improvement.

2.10.8 Hostility towards the Divergent personality

Either on the part of teachers or peers may serve as a cultural block. Every creative act is unique idiosyncratic and novel. For this reason alone creative persons tend to be individualistic non-conforming and often curiously one-sided. This is not to say, of course, that all off-beat personalities are creative the divergent attitude can as easily become a pose and a sham and a rigid defense mechanism. The task of the teacher is to penetrate such shams and to discriminate between them and the genuinely inventive personality.

2.10.9 Intolerance of the 'play' attitude

An intolerance of the play attitude in connection with school work characterizes the environments which stifle creativeness. Innovation requires freedom to toy with ideas and materials encouragement to deal with irrelevancies and permission to deep in to fantasy and make believe. This attitude allows the ideas and other material under consideration to take on plastic qualities and so to lend themselves to rearrangement and fusion which mark the creative act creativity as profound fun.

2.11 TEACHER'S ROLE IN DEVELOPING CREATIVITY IN SCHOOL

Educationalists are interested in understanding different school environments and conditions which affect creativity development positively. Researchers have shown that the school conditions, the child's needs and motivations, teacher's behaviour in the class, teacher-pupil relationship, method of teaching and materials of teaching are
important factors to help developing creativity of the child.

The teacher's role in the school is very important which influence the children in many ways, the teacher's classroom behaviour and approach to the type of learning teacher's controlling strategies, openmindedness, authoritarioism and other teaching characteristics affect the children. The teacher's level of creativity directly influences student's creativity, incentive and behaviour. Spames and Harding have listed twenty principles through school experiences which are worth to be noted for this study. Behler\textsuperscript{21} has quoted in his book as under:

1. Be on the alert for new ideas and encourage the pupil to develop all their creative talents.
2. Make children more sensitive to environmental stimuli.
3. Encourage manipulation of objects and ideas.
4. Teach how to test systematically each idea. Starting as early as third grade, show pupils how to define a problem and keep testing each idea. The neuristics described by palyamight be used as a guide.
5. Develop tolerance of new ideas.
7. Develop creativity class-room atmosphere, a free, relaxed and unhurried one.
8. Teach as child to value his creative thinking. Encourage students to note their ideas in concrete form whenever possible, perhaps in special note-book set aside for that purpose.
9. Teach skills for avoiding peer sanctions. It a highly creative pupil rubs too many class-notes the wrong way, help him to become more aware of feelings of others.
10. Give information about the creative process. You might do this by acquainting students with walla's four steps in problem-
solving and by neuristics.

(11) Dispel the sense of awe of master places. Indicate some of the methods and difficulties experienced by famous creative people to dispel the notion that only a gifted few experience brilliant and perfect insight at the first try.

(12) Encourage and evaluate self-learning. Avoid over-structuring the curriculum.

(13) Create 'thorn' in flesh.' Ask controversial questions and call attention to disturbing data.

(14) Create necessities for creative thinking. Confront your students with provocative problems. You might use the suggestion of Bruner and Biggs as guide.

(15) Provide for active and quiet periods. Remember the impact of habitual set and functional.

(16) Make available resources for working out ideas.

(17) Encourage the habits of working out the full implications of ideas.

(18) Develop constructive criticism, not just criticism.

(19) Encourage the acquisition or knowledge in a variety of fields.

(20) Develop adventurous, spiritual teachers.

2.12 CREATIVITY AND ITS CORRELATIONS :-

The systematic part study of researches in creativity was find out the relationship among intelligence and academic achievement and several others in past years has been made as follows:

2.12.1 Intelligence :-

There was the time when creativity and intelligence were thought as one and the same thing. But it is not so now. Now a days researches have tried to establish a close relationship between these two different mental abilities. Creativity and its components are affected
by intelligence and fluency and relationship of intelligence among students, are included in the field.

There is no consensus regarding the relationship between creativity and intelligence and still it is a debatable issue.

2.12.2 Achievement :-

Fostering creativity did not have a negative effect on achievement. It gives confidence to the investigators that their attempts for developing creativity may not in any way affect the student's achievement. The under achievers are given the procedure of problem definition and problem solution. The creativity training motivated them to solve their own problems. Among bright students the most highly creative once excel in achievement to as great a degree as to the highest I.Q. Students.

2.12.3 Personality :-

It is related to personality of a creative child, creativity and personality growth and trends of creativity components, Personal variable and second order personality correlates of creativity. Creativity is related to the values of the Indian adolescent students. The personality structure of a person also plays an important role in the invention, imagination or Production of a creative work.

2.12.4 Teacher Training :-

Attempts were also made to give some training for the changing behaviour of teachers in their class-room for the development of creative thinking in students. The prospective teachers improved in fluency and flexibility, during the training period and originality and personal worth during students teaching. Pupils improved in fluency, flexvility and originality but declined in elaboration. Inservice training should be continued in the operational phase to improve the teacher's familiarity with those progressive educational strategies. Besides, the
training for teachers, and administrators was also found to be successful.

2.12.5 Education:

The goal of education is to develop capabilities, individual expression, inventiveness and gifted leadership. This can not be fully attained without the adequate and accurate knowledge of creativity.

There are indications that our whole education structure is unable to assess creativity. But actually it is a biased notion. Most of teachers do not care much for the unusual 'Off-beat child' who give answers. That do not conform to same predetermined idea of what is correct.

Different researches give reviews about teacher's creativity and family back ground - a study of relationship, creativity and academic achievement among school pupils. Creativity is significantly related to achievement, anxiety, independent education and occupation.

2.12.6 Its Measurement:

This includes the trends and status of testing in creativity problems in measurement of creative thinking and their uses.

2.12.7 Researches on Creativity Development:

This is a branch of research in the field of creativity which is the most important. On a few researches have been done in this field. Some well known researches are:

(a) Special programme for developing creativity
(b) Techniques for development of creativity
(c) Creativity problem - Solving
(d) Divergent thinking

From this classifications given above, some researches related to the creativity development are discussed here under in the following categories
(1) Creativity development studies: creative thinking programmes.

(2) Creative development studies: productive thinking programmes.

(3) Creative development studies thinking programmes based on school subjects.

(4) Creative thinking programme: Its correlates.

2.13 CREATIVITY AND PRESENT STUDY

The discussion in the foregoing sections, several generalizations for class-room teaching can be suggested. The central purpose of education in a democratic society is the development of mental abilities and thinking power of the students.

Creativity has been perceived as multiphasic, normally distributed mental ability. All the students are capable of creative expression. The teaching learning process is so complex and the number of interacting variables so great that a precise list of definition effecting teaching especially creative thinking, is wishful thinking. It is therefore necessary to relate specific teaching behaviours to specific goals and to explore out come in items of creativity.

The knowledge of creativity development technique and creative learning and enrichmental model throws full light in understanding this study. Here creative learning is referred to what happen when the pupil become involved in the creativity learning process is understood as one of becoming sensitive to or aware of problems, deficiencies gaps in knowledge missing elements, disharmonies, as so on: bringing together available informations defining the difficulties or identifying the missing elements searching for solutions, making guesses or formulating hypotheses about the deficiencies. This definition may be taken as a natural human process with strong motivations at each stage.
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