CHAPTER II
ABOUT CREATIVITY

CONTENTS

2.1 THE CREATIVE URGE

2.2 CONVERGENT THINKING
2.2.1 Reproductive Thinking
2.2.2 Productive Thinking
2.2.3 Logical Thinking
2.2.4 Critical Thinking

2.3 DIVERGENT THINKING: A BASE OF CREATIVE THINKING

2.4 LATERAL THINKING: THE OTHER BASE OF CREATIVITY THINKING

2.5 CREATIVITY VIEWED AS:
2.5.1 Creativity as Originality
2.5.2 Creativity as Process
2.5.3 Creativity as Product

2.6 CREATIVITY: ITS COMPONENTS

2.7 HURDLES OF CREATIVITY

2.8 OVERCOMING THE HURDLES TO CREATIVITY THINKING

2.9 TECHNIQUES: TO DEVELOP CREATIVITY

References
2.1 THE CREATIVE URGE

The creative urge is human and mysterious of all individual attributes. There has been a staggering quality of marvelously world's cultures in which creativity flowered abundantly during certain epochs, and then dropped off like a spent flower when whatever psychic energy had fueled its growth was used up. Creativity is not just isolated work of genious but a fertile continuum of human life into which speeds from all may fall and sprout. Certain individuals, too, have been blessed with above all other people. It is also an ordinary individual on any given day may satisfy the definition of the verb create: to bring into being; causes to exist.

The essence of creativity resides in qualities like the original, novel, ingenious, unexpected and inventive appears in anyone. The creative process involves both skills and imagination, and it requires an inventiveness and originality. One way to track the creative urge is to examine how famous scientific break throughs occurred.
What are the steps that lead to burst of original thinking. Second way is to see how highly creative people have explained their own methods. A third way to examine the creative process is to analyze the environment that seems to nourish creativity and assess tests that attempt to identify creative components.

There are various types of thinking. Among them specific are directly related to creative thinking. It is required to be aware of them and their components to understand the creative thinking. There are certain bases for creativity which are to be discussed below in the coming captions.

2.2 CONVERGENT THINKING

Convergent thinking is the major approach to problem solving. It is that which leads to a narrowing of alternatives until one solution is arrived out. It uses systematic reasoning processes in a search for the right answer. It uses facts to solve problems. Meaning of convergent thinking could be understood from the following discussion.

2.2.1 Reproductive Thinking

Reproductive thinking as Maier believed:

"It is characterized by the solution of problems
by means of stimulus equivalence in the novel situation or problem and in the previously mastered situation. Thus, it and transfer of training are to be considered closely similar if not identical phenomena."

It is a process of arriving at a solution through the direct application of previous learning.

2.2.2 Productive Thinking

In productive thinking past experience is repatterned and restructured to meet current demands, and is thus the counterpart of reasoning.

It is not merely the process of arriving at solution through the direct application of previous learning.

2.2.3 Logical Thinking

Logical thinking is a way of using mind. There are specific techniques that can be used to develop skills in logical thinking. Goodwill and exhortation are not enough to develop skill, one needs an actual settings in which practice these tangible techniques to develop logical thinking.

2.2.4 Critical Thinking

A general phase of intellectual activity which cuts across many thought processes in critical thinking
Methods of logical analysis, inferences, deduction, incubation and evaluation are commonly included. Various authors suggest policies and procedures for development of critical thinking, organized in keeping with their particular analysis of thinking process.

Provisions of opportunities for growth in intellectual abilities and skills through improvement of comprehension, application, analysis and evaluation are required. To enhance comprehension, it is urged a programme in school aimed at avoiding careless generalization, preventing confusion of words with their meaning, using who-what when-where indexes. Emphasis should be made on Dewey's five steps: identification of the problem, formulating of hypotheses, deductive consequences of the hypotheses, gathering more data if necessary and drawing conclusions.

2.3 DIVERGENT THINKING:
A BASE OF CREATIVE THINKING:

Divergent thinking leads to a broadening of the definition and criteria of the problem so as to generate a wide variety of possible solutions, many of which are acceptable and some of which may be creatively superior. Divergent thinking is identified by fluency, flexibility, originality and elaboration in a process that is thrice wheeling and imaginative. Divergent thinking is free to
develop its own data, raise its own questions or take new directions.

The unique features of divergent problem is a variety of responses produced. The product is not completely determined by the information, that is to say that divergent thinking does not come into play in total process of reading a unique conclusion, for it comes into play wherever there is trial and error thinking. The well known ability to word fluency is tested by asking the examinee to list words satisfying a specified letter required. This ability is now regarded as a facility in divergent production of symbolic units. The parallel semantic ability has been known as identical fluency. The divergent production on class is believed to be the unique featured of a factor called spontaneous flexibility. In this, subject goes frequently from one class to another. When subject goes to think about one class to use— it is to be called identical fluency.

A unique ability improving relations is called associational fluency. One factor pertaining to the production of system is known as expressional fluency.

A factor that has been called originality is recognised as adoptive flexibility with semantic material where there must be a shifting of meaning. The examinee must produce the changes in meaning and so come up with
novel, unusual, clever ideas. The number of clever responses given by an examinee is his score for originality.

Ability to produce a variety of implications is elaboration of given information.

They all, above mentioned are the divergent thinking abilities and they are the base for creativity.

Focus on different style of thinking helps to illuminate discussions of divergent thinking and convergent thinking. The distinction between convergent thinking which uses systematic reasoning process in a search for the right answer and divergent thinking which is marked by fluency, flexibility, originality and elaboration in a process that is more free-wheeling and imaginative. In a sense, convergent thinking uses facts to solve problems while divergent thinking is free to develop its own data, raise its own questions or take new directions. To some extent, these types of thinking should be considered as characteristic style or modes for given individuals, not as better and proper approaches to problems.

Whitmill\(^2\) found that when teachers used the discussion technique, the students improved in divergent thinking and that the lecture-recitative technique fostered convergent thinking of pupil.
Lateral thinking is closely related to creativity. Edward De Bono suggested in his book *Lateral Thinking* (1973) that at school the emphasis has traditionally always made on vertical thinking which is effective but incomplete.

Vertical thinking is a traditional type of thinking. It is one moves toward by sequential steps, each of which must be justified. Correct solution would be impossible. One selects act only what is relevant.

Lateral thinking emphasis the effectiveness of vertical thinking. Vertical thinking develops the ideas generated by lateral thinking. One could not dig a hole in a different places by digging the same hole deeper. Vertical thinking is used to dig the same hole deeper, and lateral thinking is used to dig a hole in a different place. Vertical thinking in itself is dangerous because it is useful to some extent. The exclusive emphasis on VT in the past makes it all the more necessary to teach lateral thinking. VT alone is not sufficient. VT by itself can be dangerous.

Insight and humour both involves restructuring but with more emphasis on escape from restricting pattern. Lateral thinking involves restructuring, escape and the provocation of new patterns. It is closely related to...
creativity but where creativity is too often only the
description can only admire a result but one learn to
use a process.

There is about creativity a mystique and intangible. This may be justified in the world where creativity involves aesthetic sensibility, emotional resuable and a gilt for expression. But it is not justified outside that world. In order to use creativity one must rid it of this area of mystique and regard as a way of using mind- a way of handling information.

Lateral thinking is concerned with the generation
of new ideas. New ideas are stuff of change and progress in every field from science to art, from politics to personal happiness. It is also concerned with breaking out of prison of old ideas. It leads to this change in attitude and approach to looking in a different way at things which have always been looked at in the same way. Liberation from old ideas and the stimulation of new ones are twin aspects of lateral thinking.

Lateral thinking like logical thinking is a way of using mind. Logical thinking is a way of mind and attitude of mind. There are specific techniques that can be used just as specific techniques in logical thinking. Goodwill and exhortation are not enough to develop skill in logical thinking. One needs is an actual setting in which to practise and some tangible techniques with which
From an understanding of techniques and from fluency in their use, lateral thinking develops an attitude of mind. Lateral thinking is not some magic new system. Lateral thinking is a very basic part of thinking and that one can develop some skills in it.

2.5 Creativity Viewed As

Psychologists and educationalists have experimented with life from various angles and at various levels. Arnold Toynbee (Historian-1964) defines creativity as to give a fair chance to potential; creativity is a matter of life and death of society. Potential creative ability can be stratified, started and stabilized by pervasiveness in the society of adverse attitude of mind and behaviour. Torrance (1962) defined creativity as it takes little imagination to recognize that the future of our civilization depends upon the quality of creative imagination of our next generation. According to Indian Philosophers creativity can be defined as "May in his ability to create new forms." Creativeness based on the needs of man and realities of his nature. The pioneer work in this field had been done by Guilford who believes it to be divergent thinking ability involving sensitivity to problems, flexibility, fluency, originality, elaboration. Vat
27

(1977)\(^5\) believes that inner directed, ordinarily not capable of being elicited at will. Rawt and Gary\(^6\) also remarked as the invention of something that is new, rather accumulation of skills or the exercise of books' learned knowledge.

Creativity is viewed as originality, as process and as product as discussed below.

2.5.1 Creativity as Originality

Thurston\(^7\) argued whether or not society regards an idea as novel is immaterial. He maintained that an act is creative if the thinker researches a solution is a sudden closure which implies some originality for him. The idea must be artistic in nature, mechanical or theoretical. It might be administrative if it solves an organizational problem. It is a broad enough to encompass a new slogan, a clever chess move, or a new football play. Stewart\(^8\) shares this view, maintaining that productive creative thinking may occur even if the idea has been produced by someone else at an earlier time.

Stein\(^9\) said that "creativity must be defined in terms of culture in which appears, to him originality or 'novelty' implied that the creative product did not previously in the same form." It means a reassembling of existing materials or knowledge, but it must contain new
elements which the previous product did not. He goes a step further to insist that the original work, in order to meet his definition of creativity, must be accepted as useful satisfying by a group at the same time when it is produced.

2.5.2 Creativity as Process

It can be defined as, "one discovers something new, rediscover that has already been discovered by another, or rearranges existing knowledge—a rearrangement which may well involve an additional to knowledge."

Suzanne Langer observes that "most discoveries have suddenly been things that were always there." She compares a newly created idea to a light that "illuminates presences which simply had no form all for us before the light fell on them. We turn the light here, there, and everywhere, and the limits of thought recede before it."

Edger Dale of Ohio States University once illustrated as process with the following anecdote.

"When C was teaching arithmetic I discovered that one multiplies by 9, the digit in the answer is always total 9. Doesn’t everybody know that? I didn’t know it, and for me it was a discovery."

Spearman defines creativity as a process of seeing or creating relationships with both conscious and
subconscious process operating. He believes that when two or more ideas are presented, a person may perceive them to be in various ways related (hear, after, the cause of, the result of, a part of, etc.). He also holds that when any item and a relation to it is cognized, then the mind can generate in itself another item so related.

Barchlon divides the thinking processes involved in creation into two kinds: Cognito, to shake and throw things together and intellige to choose and discriminate from many alternatives and then synthesize and bind together elements in new and original ways. What he views as cogito is apparently similar to what Kubie describes as taking place in the pre-conscious. The pre-conscious is in this sense able rapidly to bring together experiences and memories—things half remembered, to join opposites, and discover relationships at speeds impossible to obtain in the conscious system. Although the resulting destinations, the flashes of insight may spring from the pre-conscious, they will still need refining and verification.

2.5.3 Creativity as Product

It assumes that the subject will produce something new, something that involves novelty, originality and serious effort.

Haminowitz and Maimowitz emphasize that there is
a factor in creativity which relates to the product itself as they state "Creativity is the capacity to innovate, to invent, to place elements together in a way in which they have never been placed before, such that their value or beauty is enhanced.

Thus the creativity is the discovery of a new relationship among the phenomena in the physical world which is new to the child.

2.6 CREATIVITY : ITS COMPONENTS

In India, Dr. Chauhan and Tiwari discovered eight creativity components from their component analysis study in 1977. They are -

1) Creative Production : It refers to possessing both literary and constructive creativity. The semantic contents through divergent thinking give units and figural contents, resulting in transformation.

2) Fluency : It refers to rapid flow at ideas and tendency to change directions and modify information. It is the quantitative representation of the unit of products. It emphasizes the rate of production of all the units within all classes. Fluency is of four types, namely:
   (i) Ideational Fluency : It is the generation or production where free expression is encouraged and where quality is not evaluated.
(ii) **Expressional Fluency** : It refers to the production of new ideas to fit a system or logical theories. This facilitates the construction of sentences.

(iii) **Associational Fluency** : It indicates production of ideas or words from a restricted area in equal relationships.

(iv) **Word Fluency** : It is the generation of words of specifically required epithets. It is concerned only with words. It has drawn by divergent process using semantic content to give a product of units in a table. Various to measure word fluency use prefix, suffix or first or last letter of words.

3) **Originality** : It refers to unusual ideas and suggestion for unusual applications of particular objects. It indicates unconsciousness or newness in the product.

4) **Flexibility** : It is the readiness to change whatever the behavior to meet changing circumstances. It represents number of classes of objects or traits ideas produced. It indicates in how many distinct ways an individual can respond to a student. Flexibility is of two types.

(i) **Spontaneous** : It is the production of diversity of ideas in a relatively unrestricted situation, and,
(11) Adaptive Flexibility: It is the same divergent transformation quality which involves changes.

5) Ingenious solution to problem (ISP): It is inventive. It is the right answer choice among many alternatives ones.

6) Elaboration: It refers to the expanding and combining activities of higher thought. It shows production of detailed steps, variety of implications and consequences, which can be quantitatively measured.

7) Sensitivity to Problem: It indicates the receptivity for problems when the creator sees defects, needs, deficiencies, addities, unusabilities and sees what must be done. Whether the problem is simple or complex, he attaches it from various angles.

8) Redefinition: It is closely related to flexibility and originality that arises from transformation, specifically convergent productions. It is the ability to re-arrange ideas, concepts, people and things to shift the function of objects, and use them in new ways. It can be applied to different type of contents in the same way or figural, symbolic, sementic etc. and they can be named with their names as figural redefinition, symbolic redefinition and so on and so forth.

Thus, it is evident that the concept of creativity components emerges from divergent thinking technology. The
components of creativity remain unique in their content production relationship. Their predominant mental operation of the divergent type.

2.7 HURDLES OF CREATIVITY

Everyone has within him the basic capacity to be creative. No person likes to think of himself as average. Before worthwhile and original work can begin, the creator must master skills necessary to express his ideas. The creative process is as highly personal and individualistic as the individuals who to the creating. But one time or another, all creative people must go through essentially the same step. They find source of inspiration, express their ideas, reflect on them and refine them to the point of fruition. 17

There are three different types of blocks possessed by most individuals that inhibit creative thinking. 18 They are:-

(i) Perceptual block,
(ii) Cultural block, and
(iii) Emotional block.

The first one is perceptual block. These are the types of blocks that makes persons
"what to kick themselves", for not having seen the solution previously. That cause persons to begin their work in problem solving without the purpose of goal in mind. These have to do with their statement of the problem, their biases toward and pre conceived notions about the problem. While persons are not talking about attitude as such; it should be recognized that there is little in their outward behaviour that when they discuss thinking in behaviour. These perceptual blocks are :-

(i) difficulty in isolating the problem,
(ii) difficulty caused by narrowing the problem from much,
(iii) the inability to define terms,
(iv) failure to use all of the senses in observing,
(v) difficulty in seeing remote relationships,
(vi) difficulty in not investigating the obvious, and
(vii) failure to distinguish between cause and effect.

(II) A second set of block one turn is cultural. These are caused by the way that one has been brought up, what one has been taught to believe as right or wrong, good or bad. The cultural blocks to a creativity are some of the most difficult to eliminate. It requires a certain amount of courage to create. These are the :

(i) desire to conform to an adopted pattern,
(ii) One must be able to practical and emotional above all, so often judgement comes into play too quickly.
(iii) it is not polite to be too inquisitive nor wise to doubt everything,

(iv) overemphasize on competition or on co-operation,

(v) too-much faith in statistics,

(vi) difficulties arising from over-generalization,

(vii) too much faith in reason and logic,

(viii) tendency to follow the all-or-nothing attitude,

(ix) too much or too little knowledge about the field in which one is working, and

(x) belief that indulging in fantasy is worthless.

(III) Finally, every one has the emotional blocks, which are within all because of insecurities all feel as individuals. All individual feel insecure to some extent. These blocks are:

(i) fear of making a mistake or making a fool of oneself,

(ii) grabbing the first idea that comes along;

(iii) rigidity in thinking,

(iv) overmotivation to succeed quickly,

(v) pathological desire for security,

(vi) fear of supervisor and destruct of colleagues and subordinates,

(v) lack of drive in carrying a problem through a completion and test, and

(vi) lack of drive in putting a solution to work.

Functional fixedness$^{19}$ is a block to creativity.
When facing a problem, subjects sometime get a mental set that fixes or limits the way that most of the person tackle the problem. Psychologists call such difficulties as functional fixedness.

2.8 OVERCOMING THE HURDLE TO CREATIVE THINKING

There is no magic formula for removing the that bind creative thinking. Essential at all time is a positive attitude, rooted in self analysis and desire to improve. The person who has been toiled in a creative problem must begin his new attempts by questioning: what caused the blocks? How can one remedy it? Awareness is the key to overcoming creative hurdles. Subject must be constantly aware of all the different way in which subject thinking and idea output may be blocked. The first step toward a remedy, therefore, is to recognize these blocks. Design checklist, develop and keep it in front of subject when he is working on problem. One can device such check-list. Subject should refer it regularly when he is temporarily halted on problem. He should use imagination and all of his creative functions. Above all have confidence.

Eugene Randsepp suggests numerous activities, attitudes and strategies for increasing creative productivity, nearly all of which are consistant with known principles of creative problem solving. These suggestions can
contribute to understanding the nature and nurture of pupil's creativity as well as overcoming the blocks to creative thinking. The steps to more ideas are listed as under.

Creative power is a broad background of accumulated knowledge. To increase the fund of total experience one should set time aside to read in other field. Takes notes while reading. Anything as significant stimulating, or interesting should be preserved for later reference. Collection and filing of clippings, notes and ideas that seem to be original are useful. One should look them over occasionally which stimulate him idea production. One should attempt to work or wire on a problem outside his own problem which will increase his ability to incorporate new information and ideas into his own problems. Moving about in tried circle and society is useful. Ideas which spark new must be exchanged with others. One should cultivate hobbies like chess, bridge, and puzzle solving which would be helpful in overcoming the hurdles in creative thinking.

Creative individual has to have an intimate knowledge of the basic principles and fundamental concepts of his field. One should not be too quick to throw out unorthodox or unusual ideas. He should think of, about it, do minor changes that make them practical. It is important to look for the key factors of problem and try
to isolate them. Pin-pointing the problem is an essential step to undertake.

For hand of ideas a checklist is useful to get started on solving a specific problem. First of all list the ideas and various approaches that might solve the problem. No idea should be rejected at this stage as of no consequences until later is proven so. One must try again and again, in spite of discouragement.

Feeling of pressure is good to marshal aid from subconscious source or from one's own past experience.

One must boost his lagging enthusiasm. There are some ways to increase lagging creative derive are mentioned below.

Suspension of judicial thinking is good one way. During the heat of creative problem solving, criticism and judgement must be suspended. A sense of freedom from time restriction is an important factor in the solution of problems, even though a subjective sense of pressure and need are there. One must not trust on one's memory. An idea that occurs during a brief amount is irretrievably lost if not recorded on the spot. Proper mode is important for problem solving but one must not wait for it. One should pick up a pen or pensil and start writing down the different aspects of problem, the different approaches might use, and the directions one's might want to explore.
Effective creative process requires continuous shifting between involvement and detachment. If one is not making any headway, even after one's second wind, he must drop problems and do something different. Break off and relaxation are useful. The ideas most occurred during passive and relaxed states or even under fatigued or half waking conditions. Determination of the physical conditions during which one regularly do one's best thinking is helpful. In fact, one should deliberately make an effort to ascertain what sort of physical activity accompanies one's most productive effort, and then deliberately assume it attempting to solve problems. During problem solving, one must avoid distractions and instructions as much as possible. The ability to maintain a basic peace of mind even when tackling problems is an important. Development of a retrospective awareness of the periods when one solved his problems creatively is also important. Self-knowledge in the area of creativity will aid idea production. One should be alert for ideas when riding in bus, when at movies and especially the brief periods proceeding and following sleep. An enormous amount of hard-work goes into the polishing of an idea before it becomes workable things.

These are the various ways to overcome the hurdles to creativity. Creative thinking techniques are useful to use these ways to overcome the blocks to creative thinking which are discussed in the coming caption.
2.9 TECHNIQUES TO DEVELOP CREATIVITY

Creative thinking techniques are conscious and deliberate procedures for producing new ideas and combinations of ideas. "The Art of Creative Thinking", assert Whiting, "is the term generally applied to a body of principles and techniques which have evolved to accomplish this end".21

"It is wrong to say that the process of creative thought cannot be taught as to say that medicine or engineering cannot be taught. There is a reason for anything that happens in the world. We can find the reason. When we actually learn how; it is an easy matter to go ahead and make things happen".22

Techniques to develop creative thinking are: brainstorming, attribute listing, checklists, morphological synthesis, synetics, and buzz session (Phillips 66).

1. Brain Storming

Brain Storming is a formal setting for the use of lateral thinking. In itself it is not a special technique but special setting which encourages the application of the principles and techniques of lateral thinking while providing a holiday from the rigidity of vertical thinking. Brain Storming is a group activity and individual activity. Nor does it require any teacher intervention.23 The main
features of BS session are:

(1) Cross stimulation,
(2) Suspended judgement, and
(3) The formality of the setting.

BS technique originated and popularized by Alex F. Osborn. It operates on the deferred judgement. It involves rapid-fire, spontaneous, from a group participating freely large number of ideas which are wild or sensible.

Out of numerous ideas that results, there is a maximum of assurance that many good ideas will be generated. One need to move to a new arrangement of information and then one can carry on from there. The new arrangement of information is a provocation which produced some effect. In it the provocation is supplied by the ideas of others. Since such ideas comes from outside one's own mid they can serve to stimulate one's own ideas. In a Brain Storming session one gives out stimulation to others and he receives from other members. During BS session the ideas are recorded by note takers and perhaps by a tape recorder as well. These ideas can then be played back at a later date in order to provide fresh stimulation. Although the ideas are not new the context has changed so the old ideas can have a new stimulating effect.

There is no evaluation until the all ideas are in. As a result, even shy, non-verbal children are often caught
up in the excitement of producing ideas. In addition to contributing ideas of their own, children are also encouraged to suggest how two or more ideas may be combined. If five percent of ideas are accepted during the evaluation session, the session may be considered successful.

Basic principles which characterize this technique are:

i) Accept every idea, impractical as it may seem;

ii) Emphasize quantity rather than quality;

iii) Prohibit all criticisms of ideas during the idea producing stage;

iv) Encourage combination of ideas; and

v) Defer evaluation until the second stage of the process-following the idea-producing stage.

Brain Storming provides a climate of psychological safety in which encouragement, respect for the ideas of the others, and excitement of group success is fostered. It promotes uninhibited imagination and excuses the individual from having to defend a particular idea at the time he suggested. It, later, when the list of suggestion is carefully scrutinized for fruitful ideas the originator of a "wild" or "useless" idea is not embarrassed by having the group know that his idea was not accepted as is the case in traditional activities involving production of ideas.

2. **Attribute Listing**

It is simple and an effective method for generating
creative ideas to improve or change virtually anything. Here the child is asked to itemize important attributes of each part of a product and then consider each attribute as a source of potential change or improvement. For example, an object as simple chalk, students identify the attributes of size, colour, shape, material and use. Then considering changes for each of these individual attributes, ideas for a large variety of chalk may be quickly produced. In carrying out a market survey students can learn to identify and improve the attributes of material, market, cost and production processes. The idea is used frequently in language arts when students are able to come up with new ideas for writing short stories by identifying and deliberately changing such significant attributes as the setting, the characters, the plot, the period. Although this is more mechanical than some of the techniques discussed, it does sensitize students to the various properties of objects and gives them a simple but productive means of innovating.

Thus, attribute listing method was discussed by Crawford.24

3. **Check-list**

With checklist procedure, students consider each item on a prepared list. A common checklist which is aimed stimulating ideas for changing a product consist of seven items:
i) Add or substract something,
ii) Change colour,
iii) Vary materials,
iv) Rearrange parts,
v) vary shape,
vi) change size, and
vii) Modify design or style.

College students in an experiment \(^{25}\) produced a significantly larger number of creative ideas for changing or improving a thumb tack and a kitchen sink that did the control group who did not use this checklist. Among the suggestion that came forth for improving the kitchen sink were adding a soap or hand lotion dispenser, suggesting orange or silver for colours, using materials such as copper, nylon, or plastic, by increasing or decreasing the size, or by designing it in a oriental or scandinavian mode. Checklists are mostly used for stimulating original thinking. Not everyone is a self-starter. Many children need that first encouragement to think on a more critical level. Checklists are intended to supplement, not to replace, the more intuitive modes of creative thinking.

4. **Morphological Synthesis**

This technique closely resembles that of attribute listing. It may be used to produce more idea combinations than any other subjects are asked to first identify two or
more important characteristics of dimensions, colour or shape, of a problem and list specific values such as red, blue, green, square, triangular, round, rectangular; for each. Next they proceed to examine all possible combinations, making use of one value of each characteristic.

The weakness of this technique is that it might prevent a thinker from using a more original approach to the problem, using a more imaginative, different perspectives.

5. Synetics

The synetic technique emphasizes primarily the use of metaphors and similar especially from nature. After posing a question or problem the experimenter encourages subjects to ask how animals, insects or even plants, for example, may be found by considering how bees or ants "store things". Proposing such ideal but seemingly ridiculous solutions to the problem such as having insects work on command to solve a transportation problem is another method for stimulating new ways of looking at and solving problems. Free-associating word meanings may lead to still more ideas. In capsule form, the synetics process involves:

i) making the familiar strange, and

ii) making the strange familiar.

One gains a fresh viewpoint which in turn implies
evaluation phase of the session, usually this fit into the total of the six to ten minutes— the chairman of each group is invited to the front of the room to present the ideas selected to the entire group. The leader of each group presents results of the session without comment. The chairman of the meeting summarize the general consensus from the group report.

Above are some techniques and experiments, which teacher may use to develop creative thinking abilities of the students.
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17. Simberge, A.L., "Obstacles to Creative Thinking", Industrial Institute, Section V, Boston, 1964, pp. 41-689.


