
UNIT 6 DEVELOPING CREATIVITY IN CHILDREN



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6.0 INTRODUCTION

In the previous unit you studied about ‘Self, its meaning and importance .In this unit you will come to know about creativity, its nature and how it can be developed in children. It is very much a part of ‘self’. You might have heard and used the term ‘Creativity’ on many occasions.



Creativity is found in all children but in different forms and degree. Children are found to express themselves in many different ways: give novel responses, suggest unusual uses for the equipment etc. Therefore it becomes important to identify such children and help them develop the same and contribute to the progress of the society.

The development of any society is dependent on the creativity of its people most of the inventions and discoveries came into existence because of the creativity of its people. What facilities are given by a society to develop creativity of its children depends upon the history and ethos of that society. Creativity of scientist, poets and others are all well known. You will learn more in this unit about creativity and how to foster creativity in children.

6.1 LEARNING OBJECTIVES

After studying this unit, you will be able to:

- Recognize the characteristics of creative people
- Identify the different types of creativity in students
- Differentiate between more creative person and less creative person
- Identify the factors influencing creativity out of a given set of ideas
- List the activities to develop creativity
- Develop skills in conducting activities to foster the creativity of students
- Develop activities to promote creativity among the students.

6.2 CONCEPT AND NATURE OF CREATIVITY

You may have seen children using funny words, crazy formations and uncommon ideas for known things or words. Recall the example of a student using ‘pomato’ for a combination of words Potato and Tomato. Also consider the following:

A dramatist from South India, as a small boy held the dog upside down and asked his father to prostrate before it. When his father became angry and asked as to why the boy is doing like this the boy said, “Yesterday you only taught me that when a dog is reversed it becomes God”. His father had a hearty laugh.

Such creative children tend to be more observant, reserved, fun loving and not afraid of speaking out something funny or crazy. Most of the children are born creative but they tend to lose it as they grow up. According to Davis, 90% of the five year old children are high creative’s and only 2% of the 25 years old people are high creative’s. Age seems to be influencing creativity negatively. The adult who had enjoyed the mischief of small children and funny words of youngsters



would expect decent behavior from adolescent children they simply become more evaluative than enjoying the ideas.

Creativity is an ability to be innovative, unusual, to be different from others or equals. It is an ability to give novel responses, new answers and establish new relationships. The child may combine two or more unrelated words or ideas and give a new answer. The use of gadgets in novel ways is another way children express themselves. You may recall the funny answer given by your student in the class for example, when a teacher asked for the third eye and where it should be, a student said it should be in the tip of his forefinger. Similarly, when students were asked to think of a new machine, a girl said she wants a plant making machine. You may have seen many such instances in your class and neighbourhood.

Psychologists have found these children to be non-normal, not adhering to the norms and traditions and sometimes daring to express the unusual ideas, which have not been thought of by others or equals. Creativity is sometimes thought to be a problem solving ability characterized by originality. When a truck loaded with materials had struck under an over bridge and people were struggling to take it out, it was a young boy who suggested deflating the tyres to some extent.

Creativity has humor as an important part in it. If you cut the joke for the first time or if you use an idea in an altogether new situation it shows your creativity. If you copy it from a magazine or internet and say it, it does not show your creativity. People may laugh and thank you for it. The HyKu poems or limericks are an excellent example of creativity of a person. Copying from a book or copying ideas of others is opposite of creativity. Imitation is against creativity. A class is always creative as many minds are tackling a problem. Someone will be daring to be different when all others are satisfied to be submissive. When Gauss was asked to find the sum of 1 to 100, the teacher thought he would take lot of time, but Gauss the young boy stood up after sometime with the answer. The teacher was surprised. The answer was like this. Keep out 50 and 100 separately, 1&99 becomes 100, 2&98 becomes 100 like this he found the pairs of numbers which makes 100 and multiplied no. of such pairs with 100 and then added 50& 100 to obtained product to find sum of 1 to 100.

Types of creativity

In general, creativity is of two types: (a) Verbal creativity, and (b) Non- verbal creativity. Writing poems, stories, novels, etc come under verbal creativity. Even cutting jokes and writing HyKupoems are of this type. Painting, sketching sculpture work, caricature, collage, rangoli can be expressions of creativity. Creating animal forms out of vegetables, using a gadget in an altogether different place come under non-verbal category.

Verbal creativity- Expressing ideas, thoughts in spoken languages, in different



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languages & in different intonation, singing, composing music, playing instruments, narrating stories in different form, advertising film, documentary, can be put in verbal creativity category while expressing ideas, thoughts in 2 & 3 dimensional form like, sculpture, painting, gardening, Bonsai, Neck Chand's rock garden, abstract sculpture, statue, drama, dance, monologue, folk dance, folk lore, architectural activity like Effil Tower, KutubMinar, TajMahal, Lotus Temple. Various types of designing like fashion and furniture, car, machinery, computer, mobile etc. can be put in non-verbal category.



Check Your Progress 1

1. Venlak as a combined name of Venkateswara and Lakshmi is an example of(/ only one of the following) :
 - a) Verbal creativity,
 - b) Non- verbal creativity ,
 - c) Theoretical creativity,
 - d) Practical creativity
2. The opposite of creativity is (one of the following):
 - a) Recalling ,
 - b) Recognising,
 - c) Repetition,
 - d) Imitation
- 3 Which of these is highly connected to creativity? (One of the following):
 - a) Submissiveness,
 - b) Talkativeness,
 - c) Originality,
 - d) Impulsiveness

6.3 STEPS IN CREATIVE THINKING

Creativity is not an inborn ability. All creative products have seen the light of the day, because people have thought systematically and worked on them. They might have had sudden flashes, of which they were not sure. There might have been some steps in their creative thinking. An example of Archimedes would be of help here. The solving of crossword puzzles are very much similar to these steps. Most of us have heard about Archimedes's crying out Eureka, Eureka and running out in the streets of Athenes.

The steps involved in the creative thinking are the following:

- (a) **Preparation:** Creative people utilize his all acquired knowledge to solve a problem in innovative manner or to create same never before seen or known. Objects, things, or convert his ideas, thoughts another into concrete, visible from successfully. This can be achieved only through prior preparation or through clear cut mental vision.
- (b) **Concentrated attention:** Concentrated mind put in energy in a particular



task or events either to achieve predetermined goal or undetermined goal i.e. focused mind more from known to unknown zone.

- (c) **Withdrawal from the problem** (Incubation) : Archimedes withdrew from the problem and wanted to take bath. Even though consciously he wanted to do another activity unconsciously he was still thinking of the problem that the King had given.
- (d) **Flash**: Archimedes found the answer to the problem, suddenly, when he saw the water spilling out from the bath tub. Then he shouted ‘Eureka’ and ran in the streets of Athens.
- (e) **Verification**: Most of us do not know that the same person came back to his laboratory, struggled with different cubes and found the Archimedes principle. He must have toiled in the laboratory for hours or months together to find the principle.

Great Scientists, Mathematicians, poets have all retained their creative spark in spite of the uncooperative environment. They must be congratulated for their ability to fight against the rigid social control mechanisms. Let us consider a few examples of these creative’s, who stood against all suppressing mechanisms and showed their creativity.

Edison was dismissed from the school Einstein was lagging behind in Science and Mathematics; Keats, Shelley, Edgar Rice Burroughs were committing spelling mistakes; James Watt was called “Lazy Bugger”. But these people have made our life livable. Thank those people in your heart silently, who have struggled against the society or system, like Marie Curie, Henry Cavendish, Rabindranath Tagore and many more.

6.3.1 FACTORS AFFECTING CREATIVITY

Normally all students of education think of ‘Heredity’ and ‘Environment’ to understand the nature of creativity. It is the environment which plays a major role compared to heredity. Most of the children are born creative, but they gradually lose their create potential, as they grow up. It is the environment which comprises of parents, teachers, the text books, the examinations, the school climate, and which influences creativity negatively rather than positively. This happen due to conditioning of mind in rigid and sensitive manner.

Four important factors have been identified by psychologists that influence creativity. They are called 4 P’s

- a. Creative product approach.
- b. Creative process approach
- c. Creative person approach
- d. Creative situational approach or press.



Let us examine each of these four factors.

- a) The creative products are easily available for evaluation and are physically seen or heard. To find out which one is more creative requires good evaluation criteria. Originality of a creative product is to be assessed from two points of view: one from the point of view of person and another from the point of view of society or both. These can be evaluated but it has to be time specific. The radio which had lot of importance at that time does not have it today. Tape recorder was a very original idea when it was invented, but today it is not. Originality also is time specific. What is original today need not be original tomorrow or next year or after a decade, because every idea thought have certain life span.

- b) The creative process is how the people think. The steps of creative thinking have been mentioned earlier, but time cannot be fixed for a student. “A” will have flash now,” B” may have flashed tomorrow. The preparation of each student differs from the other, as he/she might have read epics, novels, short stories etc.

The ability to think fluently, flexibly, originally differs from one student to the other. Even fluency can be divided into verbal fluency, associational fluency etc. Flexibility is another dimension in which students differ a lot. Research studies in the field of creativity have lead to the differentiation between convergent thinking and divergent thinking. Simulation has been used for seeking insight into the way people think creatively.

- c) The creative person approach implies how the person is,? who is creative,? what are the personality characteristics that have helped him/her in being creative, etc?. The creativity intelligence distinction has been one of the factors that have been worked on. There is low co- efficient of correlation between the two, in case of normal people. It is around +0.36, which means it is low but positive correlation. In case of students whose IQ is above 120, the co-efficient of correlation is zero. The implication is that to be creative, you require some amount of intelligence, but high intelligence does not necessarily guarantee high creativity.

The personality tests have revealed that creative men tend to be sensitive to the situation which is a feminine characteristic. Similarly creative women tend to take more risks, which is a masculine characteristic? Creative Men seem to be more feminine and Creative Women seem to be more masculine in nature.

Other characteristics common to many creative’s are: they are dominant, self-confident, out spoken, sharp witted, demanding, aggressive, self centered, persuasive, verbally fluent, relatively free in expressing worries and complaints.

They are also independent and free from conventional restraints and



inhibitions; steady in their intellectual efforts, psychologically minded, more flexible etc. All people who have these personality characteristics may not be creative, but some are good in producing ideas, products as compared to others.

- d) The creative situation approach is another way creative's have been influenced. Some common factors which have emerged are remembered unhappiness in childhood, an extra ordinary respect by the parent for the child, early sanction to explore the ideas and universe to make decisions, lack of closeness between parents and the child, emphasis on developing individual code of conduct, experience of frequently moving from place to place or culture to culture or country to country, which developed more independence, some sort of shyness, isolation and solitariness in childhood and adolescence, absence of pressures to establish prematurely his professional identity, etc.

The expressions of individuals who are creative differ from person to person, i.e. it is highly individualistic. The way in which the creative person expresses is difficult to predict, as his/her creative ability coupled with temperament, moods and values and more than these "inspiration" takes a peculiar form of its own. You cannot expect a creative person having unhappy childhood, developing good personality characteristics, producing a creative product, is a wonderful situation which cannot be imagined to be true or to occur.



Check Your Progress 2

1. The approaches to study creativity are mnemonically called as
 - a. 4 P Approach
 - b. 4 B Approach
 - c. 4 A Approach
 - d. 4 C Approach
2. The steps of creative thinking are
 - a. 4
 - b. 5
 - c. 3
 - d. 2
3. Convergent thinking is best expressed in this example
 - a. School
 - b. Essay
 - c. Homework
 - d. Theorem
4. If the parents get transferred every 3 years and the student moves with the parents, it is beneficial to the student from the point of view of
 - A. Intelligence
 - B. Reflective thinking
 - C. Creativity
 - D. Logical Thinking



6.4 STRATEGIES FOR DEVELOPING CREATIVITY THROUGH CURRICULAR AND EXTRA-CURRICULAR ACTIVITIES

The activities which are tried out in the classrooms in the context of academic areas can be called 'scholastic' activities. Generally, these are done as part of curricular subjects such as science, mathematics, social science etc. 'Co-scholastic' are the ones which are teacher posed, but done outside the curricular activities such as sports, games, debate, club activities like music, etc. A large number of activities could be done as parts of curricular and also co-curricular activities. The brain storming can be scholastic, if the teacher wants to do as part of teaching a particular subject. An activity can either be scholastic or co-scholastic, depending on where and how the teacher does the activity.

Activities to develop creativity are many in number. An estimate in 1980 was that there were more than 700 techniques to develop creativity. These can be divided into two types: a) Techniques, and b) Instructional materials. Techniques are more people-specific and differ from person to person. Instructional materials could be got xeroxed and researchers can read the manual and administer the materials on groups of students. Let us take two examples for both of them each.

6.4.1 BRAIN STORMING

This technique was developed by Alex Osborn. As a psychologist, he had studied the way people think. Most of us evaluate our thinking immediately much before the idea is born. We abort them, thinking about what would others say on this point, may be your mother, father, brothers, sisters, colleagues or the boss, etc. Hence, Osborn divided the thinking into two stages : a) Ideation stage and b) Evaluation stage. In the Ideation stage, he has given four principles.

1. Free wheeling is emphasized. Whether the idea is crazy, funny or costly express it.
2. Criticism is avoided. Self criticism or of others is not permitted.
3. Quality breeds quality. More the number of ideas, the chances of better ideas are there. Hence, larger number of ideas are welcome.
4. Hitchhiking is allowed. That means you can combine your ideas with that of others.

American psychologists have used Green light stage for ideation and Red light stage for evaluation stages. Students or people of various backgrounds, say 6-8 of them are made to sit in a circle and they are made to express ideas freely, and openly, without fear of anybody or authority. These ideas are immediately recorded by a stenographer or tape recorded, without the knowledge of the participants.



In the evaluation stage, many officers and a few of the participants will sit and consider all the recorded ideas from the point of view of implementation. Many of the ideas will be novel, which the officers of that department will have never even thought of.

6.4.2 ATTRIBUTE LISTING AND CHANGING

Creative thinking is a systematic thinking, and ideas have not fallen from heaven. Hence, attribute listing and changing is done systematically. Each object has its attributes and attribute means quality or characteristic or characteristic quality. We may take a calendar and ask the students to list its attributes. Attributes of a calendar can be ,its design,its colour combination in various form,facts used in artistic and aesthetic manner to represent number and name of months,theme based pictures printed on each page i.e. wildlife, nature, festivals, children etc., its shape calendar can be designed in circular, square, rectangular or in other shapes in innovative manner.

If we keep innovation and creativity in mind while designing a calendar than a number of beautiful, attractive interesting alternatives can be developed to depict the layoutof pages of a calendar. Try to design a handmade calendar for yourself. Use your creative potential and imagination to design a calendar in your own way.

6.4.3 INSTRUCTIONAL MATERIALS TO FOSTER CREATIVITY

Many researchers and creativity psychologists have developed a number of instructional materials. Covington, Crutch field, Torrance, Cropley and many others have worked in this field. Let us consider them in groups, so that they can be used together. In India Nirpharake, Deshmukh, SubramaniaPillai, Bhaskara, Jerial and others have worked to foster the creative thinking abilities of students.

- a. Puzzle solving: Edison according to his son Charles was very fond of solving puzzles. He used to keep himself creatively open to many problems and ideas. Most of the puzzles have a clue. Identifying the clue and solving it will help you in solving the puzzle. Otherwise, you keep thinking in old formal ways and will never be able to solve it. Peter Pauper and others have written books on puzzles. “Amar Leelavathi” by Bhaskaracharya is a collection of a number of puzzles in Indian situation. You may recall Isac Asimov’s page in “Illustrated weekly of India” here.
- b. Riddle solving: Alexander, the great, invited Indian Rishie to the contest of riddle construction and riddle solving. Indian culture from times immemorial has had riddles in their literature. Grannies used to ask their grand children to solve the riddles. All the states of India have riddles in their languages. Riddle solving and riddle construction are similar to two principles of



“Synectic”, a creativity fostering techniques developed abroad. They are ‘making the strange familiar’ and ‘making the familiar strange’. Most of the riddles have been developed using analogies, may be direct, simple, symbolic or fantasy.

- c. Divergent thinking questions: These questions ask for more than one responses. Children will give a variety of responses and they are all relevant. In the examination system of today, we insist on single answer, that too teacher dictated only.
- d. Mystery plots: These are situations, where the children are accosted with a plot a theft or a murder and the children have to think like a detective. Children take to it so well that they enjoy solving such mystery plots.
- e. Consequences situations: Children are given impossible situations and when such a thing happens what would be the consequences. Students enjoy variety of consequences for these just suppose situations some of them work out long and farfetched consequences that even the adults would be astonished
- f. Story writing: These are of creative expression type where children write novel titles for the given stories. Complete the lead to finish the story, complete the half finished story, and write a full story for a given title.
- g. Poem writing: This is again of creative expression type, where children write the unusual titles for the given poem, complete the half finished poem, and write a full poem for the given title
- h. Riddle construction: Children enjoy doing this activity of creativity expression type, where they complete the half finished riddle, and write a full riddle for a given title or object or name

6.4.4 SOME MORE IDEAS

Given below are more ideas on developing creative thinking which have been tried by different authors.

- a. Sometimes 3 or 4 letters are given and each student is asked to complete them by developing a word for each letter, so that a meaningful sentence emerges.
- b. Students are given titles like equality, democracy, non-violence and they are asked to develop their paintings or pictures out of them.
- c. Each culture has fairy tales which develop imaginations. Sanskrit, Hindi, English and other languages have many such fairy tales, and even the science fictions are of much importance here. Jules verne, Aldoes Huxley are some of the persons who developed science fictions.
- d. Idea Trap Mechanism:- All of us know that there is waking stage and sleeping stage. The in-between stage is fertile for creative thinking. Students are



requested to keep a small book and a pencil, by the side of their bed. When they are half sleep, they get wonderful ideas, which they can write go to sleep. They can look into the book after 2 or 3 days and develop those ideas further.

6.4.5 QUESTIONING

Teachers and researchers have developed a number of types of questions, which can be used to foster the creativity.

1. Redefining Questions: In this type of question, children are asked to redefine an object, animal, person or event. These questions develop a new perspective and children learn to be aware of unusual characteristics and look beyond the obvious.
 - a. Why is a fountain pen like a tap.
 - b. How is a clock different from a calendar.
 - c. How are face and TV similar.
2. Consequences questions: These questions pose situations or events that might not have happened or will never happen. Such questions make the children to imagine and write the consequences, if such an event takes place.
 - a. Suppose the petrol supply on earth vanishes all of a sudden.
 - b. If it is against the law to size.
 - c. Just suppose all people in the world become mad.
3. Hypothetical questions:- In this type of questions students have to go beyond the available data (their learning) and synthesise them with their personality characteristics.
 - a. If you were the manager of a bank?
 - b. If you become an ant suddenly?
4. Provocative questions: The children may be taught a passage or they may be asked to go through a passage and proactive question may be put. They help the children to imagine and go beyond the information provided in the passage.
 - a. What would have Gandhiji done had he lived today?
 - b. Do you think lord Krishna would be the right type of leader today?
5. Questions seeking new relationships: Sometime theses questions look to be funny or crazy and may lead on to frustration on the part of the students, but they will enjoy later.
 - a. Is month a mile?



- b. Is day a week?
6. Divergent questions: These questions require the students to break from the fixed pattern of one question one answer and develop many relevant responses. The cost or time need not be an inhibiting factor in such relevant responses.
 - a. A town hidden beneath the mud has been found. What might have been the reasons as to why the town might have gone underground?
 - b. A tank is full of crocodiles. A pole is standing in the middle of the tank you have been given a rope and your job is to put a knot to the pole at the centre.
7. Challenging assumptions questions: These questions help children develop a functional understanding of the world. The assumptions are being questioned which have been accepted from a long time. These exercise the mind and children develop a new perspective.
 - a. Why questions like why should be respecting our parents?
 - b. Challenging slogans, brand names labels, etc.?
8. Future problem solving questions:- These questions require the students to design and redesign which involve good deal of innovation. They make the students look differently at things and make them think in different ways.
 - a. A machine to dig the tunnel without disturbing the traffic on the road.
 - b. An apple picking machine.
 - c. A better umbrella.
 - d. A new milk bottle.

When we pose such questions, there will be disorder and the teacher will have to tolerate it. He has to ask children to write it out. If told by one student, the others may stop thinking. The process would be as follows:

- a. Writing stage.
- b. Clustering stage (Responses are written on the board)
- c. Recombination stage (children are asked to think and recombine the ideas – the hitchhiking of Brain Storming.)

6.4.6 SOME MORE ACTIVITIES

Following activities have been taken from various sources and these can be used to foster creativity among children. They are the following:

1. Sensitivity Training:



- a) What forms do you see in clouds
 - b) What sounds do you hear in this building?
 - c) By touching you have to tell the names of the pulses.
 - d) When you go on the field visit, list the smells you have come across, etc.
2. Observation: Making children observe a pen or a handkerchief and list the observation.
Dr. Seeberg has listed 52 observations of a candle and a burning candle.
 3. Classification: Children can be asked to classify numbers from 1 to 100, or asking students to classify themselves.
 4. Alliteration: Children can be asked to list the words with the same letter and make sentences out of them. Ex:- Central, College, Coffee, Club.
 5. Multiple uses: Children may be asked to list the usual and unusual uses of newspaper, empty refill, etc.
 6. Imaginary story telling: Like Ganesha, sphinx, etc. children may be asked to imagine a man animal bird combination, develop its picture and write a story as to how it came into existence.
 7. Invention: Children can be asked to think of a new dish, and asked to list the materials required, process of preparation, and approximately tell the taste, as well as the new name for it.
 8. Listing as many uses as possible for a familiar object such as a brick, a tin can a screw driver, a cluster, a needle, etc.
 9. Asking children to list words they associate with each topic heading like size, color, feeling, etc., as many words as possible.
 10. Asking students to think of as many analogies associated with colors in nature and foods. Ex: Grass is to lettuce as snow is to milk.
 11. Asking students to suggest as many synonyms as possible for a given word and then asking them for antonyms.
 12. Asking students to add a few screws and wooden pieces to McKenna's set and developing many shapes and forms.
 13. Asking students to cut cubes and half cubes from a wooden piece plank and to make many shapes by joining them.
 14. Asking students to work on Tangram or seven piece puzzle to develop as many shapes as possible by rearranging the pieces.
 15. Asking the students to draw lines in many ways to develop new figures for the given unstructured stimulus like

6. > O } X etc



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16. Asking the students to solve the crossword puzzles which appear in magazines and newspapers.
17. Asking students to combine words and ideas from far off or remotely associated fields. Exa: Combining words to arrive at new names from list of goods and animals
18. Asking students to fix a word and start adding letters A to Z as prefix to arrive at a new brand name.
19. Asking students to combine parts of the two names to arrive at new names
Exa: i) Potato and Tomato – Pomato
ii) Sandalwood and Turmeric – Santur
iii) Sanjana and Shodana – Sanshow.
20. Asking students design new machines
Exa : i) Cards distributing machine.
ii) Plant putting machine.
21. Asking students to redesign the old gadgets or materials.
Exa: i) Duster
ii) Pen
22. Asking students to find out from the surroundings the labels, brand names, etc. which have been accepted and followed without questioning them
Ex: i) Public career on the trucks.
ii) Sound horn on the back of the buses etc.

6.5 DEVELOPING LEARNING MATERIALS TO FOSTER CREATIVITY

When the teacher is interested in fostering creativity, he/she has to have lot of patience, open mindedness, etc. and has to control his/her irritation, anger, frustration etc. At times, he/she may have to act along with the students, as though he is also puzzled. The children must be given enough freedom to think, sit in anyway they like, in other words he/she should learn to tolerate disorder in the classroom. Torrance and Myers have given a few principles for the teachers who wish foster creativity in children

- a. Be respectful of children's ideas.
- b. Be respectful of imaginative and unusual ideas.
- c. Show to the pupils that their ideas have value



- d. Encourage and evaluate the self initiated learning.
- e. Tie in evaluation with causes and consequences.

These principles are valid even for the development of learning materials by the teachers or members of non-governmental organizations. The activities they develop or the instructional materials must have the following characteristics:

- a. The activities must lead to a number of possible responses.
- b. The activities must be open ended.
- c. The activities may have a catch in them, so that it helps the students in flexible thinking.
- d. The activities can be for developing the individual abilities, like fluency, flexibility, originality, inquisitiveness, persistency, elaboration and sensitivity to problems, etc.
- e. The activities may not be immediately implementable but still, they are of value to us in the classroom.
- f. You can collect a number of puzzles, riddles, mystery plots and divergent thinking questions and keep them ready to use in the class.
- g. The activities must develop imagination and they must not insist on a stereotyped behavior.
- h. The activities may be from the models developed by creativity researchers.
- i. The activities may be extension of the lesson in the text and hence become topical in nature.
- j. Imaginary stories must be told in the classroom by teacher to enable the students to have the potential to become a leader today.
- k. Any activity can become creativity fostering activity, provided the teacher looks at it from a different aspects.
- l. Simple activities may be converted into creativity fostering type depending upon addition of a new dimensions or deletion of a few parts.
- m. Collect anecdotes from your culture or stories, which have a tinge of inspiration or creativity in them.
- n. The story books from epics and great literature of the culture can be collected and stored.

Edward de Bono's work on lateral thinking is of value here. His hypotheses are that we do not teach our children to think. It is more so in Indian situation as we insist on rote learning in order to pass examinations and tests. The classes have become lesson hearing rooms instead of becoming centers of inquiry.



6.6 ROLE OF ICT IN FOSTERING CREATIVITY

Many ICT tools are available which could be used by a teacher in the context of developing creativity. Some of the tools immediately available are black board, poster, charts, audio cassette player, overhead projector, and sometimes computer. Each of these could be made use of while presenting the activities mentioned above. For example black board/charts could be used to present a picture on which a story required to be written by students, on a audio cassette a partial story could be recorded and played in the class and asking the students to complete a story. Many figures could be had on the computer screen which is some what abstract, and students can be asked to interpret them. Many puzzle and riddles are available on the websites, which can be solved individually, without asking for anybody's help. Mystery plots and divergent thinking questions can be posed by the computers with pictures, so that students can understand the problems well and answer them creatively. Morphological synthesis can be worked on the computer, where details of the parameters can be worked out and details can be combined to arrive at a novel response. These are only a few suggestion and many more can be worked out by the teachers based up on his creativity in using the ICT tools.



Check Your Progress 3

- Brain storming was developed by
 - Covington
 - Crutech field
 - Osborn
 - Cropley
- Riddle construction or soldering is similar to Techniques.
 - Synecitic
 - Brain Storming
 - Attribute listing and changing
 - Lateral thinking
- Puzzles require a to be found to solve it.
 - Word
 - Catch
 - Dead-end
 - Screw
- The first psychologist, who drew the attention of all psychologists towards creativity in 1950's, was.....
 - Cropley
 - Torrance
 - Guilford
 - Khatena
- Teachers who wish to develop the creativity of their students must have to



- | | |
|--|------------------------------|
| a. displease the students | b. Displease the authorities |
| c. Tolerate disciplined. | d Tolerate disorder |
| 6. Science fiction develops in students. | |
| a. Logical thinking | b. Imagination |
| c. Deductive thinking | d. Inductive thinking |

6.7 ASSESSMENT OF CREATIVITY

Guilford and Torrance were the first psychologists to assess creativity. They found that many abilities put together form creativity. They are

1. Fluency: The ability to think of a large number of responses.
2. Flexibility: The ability to think of different types of responses.
3. Originality: The ability to think in a clever and uncommon manner.
4. Inquisitiveness: The ability to raise a number a questions out of curiosity.
5. Persistency: The ability to continue with the problem, even though you are failing long.
6. Elaboration: The ability to add details to the given situation or problem at hand.

Sensitivity to problems is considered as a feminine characteristic, whereas, risk taking is considered as a masculine characteristic. Therefore ,creative people have both characteristics is them. All these characteristics put together is called creativity. Only one characteristic will not form creativity. Scientists, poets, architects and advertisement people are exhibiting creativity more, compared to others.

Based on these characteristics assessment of creativity can be done, using tests. Assessment can also be done using observation and “Things done on your Own” check list. A trained observer can observe the child giving unusual answers, the process of developing a gadget, and the like. He/she can single out the more creative from others.

Testing Techniques: Torrance tests of creative thinking have been developed on the abilities given earlier. Guilford’s tests are on “Structure of the Intellect” model. In India Baqer Mehdi and B.K.Passi were the first to develop creativity tests. PassiTests of Creativity have the following sub-tests.

- a. Seeing Problems test: This test has 4 questions and students are asked to write the defects and problems of a postcard, chappel and the like.
- b. Unusual uses test: This test has 2 questions where students are asked to write usual and unusual uses of a piece of cloth, a bottle.



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- c. Consequences test: In this test, students are asked to write the consequences for improbable situation. Ex: (i) Suppose all people become mad (ii) suppose all females become males, and the like.
- d. Inquisitiveness test: In this test, students are asked to write a number of questions on a metronome and a placard.
- e. Persistency test: In this test, students are given a set of cubes, half cubes and cuboids. They are asked to construct a number of different shapes out of these given objects.
- f. Elaboration test: Students are given incomplete figures and students have to add details to them.

A number of other tests have been developed by other researchers based on Torrance, Guilford.



Check Your Progress 4

1. If a student thinks of variety of responses. This capacity is called.....
 - a. Fluency
 - b. Flexibility
 - c. Originality
 - d. Persistency
2. A clever novel and uncommon response is called.....
 - a. Fluency
 - b. Flexibility
 - c. Originality
 - d. Persistency
3. First researchers to develop tests of creativity are
 - a. Guilford and Terman
 - b. Torrance & Terman
 - c. Guilford & Cattell
 - d. Guilford & Torrance
4. If a student gives 7 defects of a chappel and the other student gives 3 defects, this ability is called.....
 - a. Fluency
 - b. Flexibility
 - c. Originality
 - d. Persistency

6.8 LET US SUM UP

Creativity is the ability to give new answers, novel relationships. Its meaning with examples was discussed. Tests are used to assess creativity, as they can be administered to a large number of students. The tests are seeing problems test, unusual uses test, consequences test, test of inquisitiveness, persistency test and the test on elaboration.

Creative thinking is systematic thinking coupled with inspiration. The example



of Archimedes is an excellent for finding the steps of creativity. They are preparation, concentrated attention, withdrawal from the problem (incubation), flash and verification.

The teacher education might suggest that heredity and environment are the factors affecting creativity. It is the environment which influences creativity more . The psychologists have listed 4 p's to remember easily. They are creative product approach, creative process approach, creative person approach, and creative presentation or situation approach. Different techniques and activities for fostering creativity have been discussed. Suggestions have been provided to develop instructional materials.

6.9 ANSWERS TO CHECK YOUR PROGRESS

Check your Progress 1

- 1 a
- 2 b
- 3 c

Check your progress 2

1. a
2. b
3. d
4. c

Check your progress 3

1. c
2. a
3. b
4. c
5. d
6. b.

Check your progress 4

- 1 b
- 2 c
- 3 d
- 4 a



ANSWER TO UNIT END QUESTIONS

1. List the characteristics of creative person

The creative persons likely to have most of the characteristics such as dominate, self confident, outspoken, sharp witted, aggressive, self centered, persuasive, verbally fluent, relatively free from expressing worries and complaints, independent, and free from conventional restraints and inhibitions

2. List three exercises that could be used to develop lateral thinking

Your list might have had 1) why questions, 2) Then questions, and 3) challenging assumptions

3. Mention the principles that are considered under ideation Stage

In Ideation stage, the four principles are .

- 1) Free wheeling is emphasized.
- 2) Criticism is avoided.
- 3) Quality breeds quality. .
- 4) Hitchhiking is allowed.

4. List a set of questions that could be used to foster creativity.

Questions can be developed on the variety that has been suggested in the material like puzzles, riddles, mystery plots, just suppose questions

6.10 SUGGESTED READINGS AND REFERENCES

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Notes

6.11 UNIT END EXERCISES

1. List the characteristics of creative persons.
2. List three exercises that could used to develop lateral thinking .
3. Mention the principles that are considered under ideation stage .
4. List a set of questions that could be used to foster creativity.
5. Try the following:
 - a. Collect a set of riddles which are prevalent in your town/state and use it as instructional material in the classroom as suggested in the unit.
 - b. Write down a small story (incomplete story) ,read it to students or record in an audio tape and play it to students. And instruct students to complete the story. By this exercise try to see how students think different and creatively.
 - c. Ask students to think and write What will happen is on the wheel chair. Analyse the response .