

BLOCK: III
INTELLIGENCE AND CREATIVITY

Unit 1 : Intelligence

Unit 2 : Types of Intelligence

Unit 3 : Piaget's Theory

Unit 4 : Creativity

UNIT- 1 INTELLIGENCE

Unit Structure:

- 1.0 Introduction
- 1.1 Objectives
- 1.2 Meaning of Intelligence
- 1.3 Definitions of Intelligence
- 1.4 Nature of Intelligence
- 1.5 Influence of Heredity and Environment on Intelligence
- 1.6 Summing Up
- 1.7 Questions and Exercises
- 1.8 References and Suggested Readings

1.0 Introduction:

In this earth, a man is always different from other living creatures. Man can think according to need, man can judge what is right and what is wrong analysing the situations. Man can also take decisions in society's acceptance way. All these are not possible in case of other animals because of the absence of one factor - intelligence. So here in this chapter, it is tried to know what intelligence is along with explaining the nature of it. This chapter also discusses the role of heredity and environment on intelligence.

1.1 Objectives:

After the discussion of this unit, you will be able to—

- *understand* the meaning and nature of intelligence,
- *explain* the role of heredity on intelligence development,
- *discuss* the influence of environment on intelligence.

1.2 Meaning of Intelligence:

The word intelligence is used very often in the life span of every human being. Intelligence plays a dominant role in all kinds of human activities. The success or failure of any task largely depends upon it. In the simplest sense, intelligence is termed as the ability to think, ability to do and the ability to adjust. It is the general mental ability with the help of which people perform all the tasks purposefully. Intelligence refers to the totality of behavioural experiences of an individual with rational thinking capacity. It is described as the ability to perceive or infer information, and to retain it in the form of knowledge to be applied towards adaptive behaviours within an environment or context.

The term “Intelligence” has been derived from the Latin root “*Intelligentia*” which means to comprehend or understanding or knowledge. In ancient India, a term “*Viveka*” was mostly used by the great Rishis and this “*Viveka*” is today known as Intelligence. It is the reasoning ability which helps to learn and understand things. In short, intelligence is the capacity of mind by application of which knowledge acquisition is possible and same can be applicable at need time.

1.3 Definitions of Intelligence:

In the field of psychology, the word intelligence is used in a very comprehensive way. Different psychologists have defined it in a number of ways which are given below:

According to **Wells**, “Intelligence is the property of recombining our behaviour patterns so as to act better in a novel situation”.

Alfred **Binet** Said, “Intelligence is what intelligence tests test”.

In the opinion of **William Stern**, “Intelligence is a general capacity of an individual consciously to adjust his thinking to new requirements. It is the general mental adaptability to new problems and conditions of life.”

Jean Piaget said, “Intelligence is the ability to adapt to one’s surroundings”.

Wagnon viewed, “Intelligence is the capacity to learn and adjust to relatively new and changing conditions”.

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All the definitions mentioned above explain intelligence as the adjustment ability of individual with his or her surroundings. Some psychologists want to explain intelligence as the ability to think, some say ability to learn and some others consider this concept as the ability of accomplishing task. Therefore a few definitions which describe intelligence as thinking or learning power or task accomplishing ability can be mentioned below:

Thorndike defined intelligence in the year 1914 as “the power of good responses from the point of view of truth or fact”

Buckingham, “Intelligence is the learning ability”.

Dearborn said, ‘It is the capacity to learn or profit by experience”

According to **Terman**, “An individual is intelligent in the proportion that he is able to carry on abstract thinking”

Woodworth and Marquis said “Intelligence means intellect put to use. It is the use of intellectual abilities for handling a situation or accomplishing any task.”

A comprehensive definition of intelligence given by David Wechsler is cited here. This definition covers all the areas of thinking capacity, activity performance capability along with adjustment ability of individual. According to **Wechsler**, “Intelligence is the aggregate or global capacity of an individual to act purposefully, to think rationally and to deal effectively with his environment.”

Stoddard’s definition on intelligence is also very comprehensive. In the year 1943, he defined intelligence as “the ability to undertake activities that are difficult, complex and abstract and which are adaptive to a goal, and are done quickly and which have social value and which lead to the creation of something new and different.”

According to **Gates & Others**, Intelligence is a “composite or organization of abilities to learn, to grasp broad and subtle facts, especially abstract facts with alertness and accuracy to exercise mental control and to display flexibility and ingenuity in seeking the solution of problems”.

After the discussion of all these above cited definitions, it becomes clear that intelligence is one kind of energy of individual in the form of mental abilities. These abilities help an individual to adjust with new situation effectively. For example, supposed 100 students take admission at the degree course in a college. At the beginning of the session, newly admitted students will definitely face some problems related to course and adjustment in new situation. But gradually they will adjust with their classmates, teachers, in new academic environment and surely attain knowledge according to their own capacity. The capacity which helped them to adjust in the college and to gain knowledge according to set goals, that capacity is intelligence.

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CHECK YOUR PROGRESS

Que.1: The word intelligence has been derived from Latin root _____ (Fill in the blank)

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Que.2: Give any one definition of intelligence.

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1.4 Nature or Characteristics of Intelligence:

The meaning and definitions discussed above reveal the following facts about the nature of intelligence:

- Intelligence refers to the general mental abilities.
- Distribution of intelligence is not equal among all human beings. It differs individual to individual.
- Intelligence follows the principle of normal distribution which states that the majority of the people are at the average category, a few

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are of above average means very bright and a few are of below average means very bright.

- Intelligence is not static in nature. It tends to vary in the same individual from age to age and from situation to situation
- Intelligence is an abstract concept which grows at the increase of age.
- Intelligence is basically a function of our neurons. So, its development or deterioration is closely related to our nervous system.
- Heredity and environmental factors influences a lot in the growth of intelligence in a person.
- Intelligence can be described as a sort of mental energy in the form of cognitive abilities.
- The existence or availability of intelligence within a person can be judged only in terms of the quality of his behaviour or performance.
- Intelligence is biological as well as social in nature.

STOP TO CONSIDER

- Intelligence refers to the aggregate capacity of the total cognitive abilities of an individual with the help of which purposeful activity and rational thinking is done by him.
- Intelligence is also described as the effective adjustment ability of a person to his new environment.

1.5 Influence of Heredity and Environment on Intelligence:

Meaning of Heredity: The psycho-biological characteristics which we acquire from our parents at the time of birth are known as Heredity. It refers to all those psychological and biological qualities in children which are transmitted to them by parents through fertilized egg. The basic substances

of heredity known as “Chromosomes” and “genes” determine these basic characteristics of individual and this is called heredity. In the words of R. S. Woodworth, “Heredity covers all the factors that are present in the individual when he begins life not at birth, but at the time of conception about nine months before birth.”

Meaning of Environment: Without heredity, everything comes under the concept of environment. Environment means the surroundings comprises of all the natural as well as artificial components in the world which come to contact of the individual at different times. E. G. Boring and others say, “The environment is everything that affects the individual except his genes.”

Role of heredity and environment: It is a matter of long lasting controversy whether intelligence is determined by heredity or by environment. This controversy regarding the relative role of heredity and environment on intelligence has given rise to three approaches:

- (a) The first one is extreme genetic determinism approach according to which intelligence differs in individuals due to genetic inheritance.
- (b) Secondly, extreme environmentalism approach which considers difference in intelligence in different individuals is because of quality of environment of children and
- (c) The interaction approach which adopts the view that differences between individuals are the outcome of interactions between heredity and environment.

All these three approaches in case of intelligence development can be discussed in the following way-

- (a) **Extreme Genetic Determinism Approach or the Heredity theory** explains that intelligence is completely determined by the genetic factors. The chief exponents of the heredity theory were Galton, Karl Pearson, and Mc. Dougall.

Galton in the year 1869 conducted a research work “Hereditary Genius”. In this work he tried to proof that when fathers are of superior level intelligence, then there is high probability of occurrence of greatly gifted

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children. He had experimented with identical twins and had found that twins exhibited marked similarity in their behaviour where heredity played the dominant role.

According to Karl Pearson the influence of environment is far less than the heredity in determining the intelligence. He had given evidence to show that for the people of same race within a given community, influence of heredity is seven times more than that of environment.

In 1969, Jensen in an article firmly expressed that genetic factors are strongly responsible for differences in intelligence. Jensen wrote his article after a research study carried over 1200 California School children taking from both black and white community. In that study it was found that black children scored 16 points lower in I.Q. test than that of the white children.

In 1975, Wilson conducted a twin study. In this study he tried to test I.Q. over 100 pairs of twins on the Wechsler scales at their age of 4, 5 and 16. He found a strong correlation between the I.Q. scores of identical twins in comparison to the scores of fraternal twins.

In 1981, Bouchard and McGue conducted a study and reported the results in comparative way by application coefficient of correlation. The results show that- the Coefficient of Correlation between identical twins have 0.86, between parents and children 0.56, between brothers and sisters 0.53, between half siblings 0.31 and between cousins 0.15. With the help of this study report, they tried to establish that co-efficient of correlation is higher in case of closer blood relationships and it decreases at the decrease of magnitude of blood relation. So this study proves that mainly heredity is responsible for intelligence development.

In this way, several examples can be noted here in establishing the hereditary approach. But much controversy is also there against these arguments which will be discussed in next approach that is in environmental approach.

STOP TO CONSIDER

- Heredity theory says that an individual's intelligence is exclusively determined by the genetic factors.
- Bouchard, Mc. Dougall, Karl Pearson, Galton, etc. are the main supporters of genetic theory of intelligence.

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(b) Extreme Environmentalism approach or Environmental theory gives lots of evidences in support of the role of environment on intelligence development. J.B. Watson was the main supporter of environmental theory of intelligence who stated, "Give me a child, I will make it as you want". Hereditary factors are discounted in this theory. Individual differences in intellect, personality, performance, etc. are all the outcome of learning and experience. So it is- differences in the quality of the environment that cause inequalities between individuals.

Evidence of strong Environmental Influences on Intelligence can be found in the following studies—

Schiff et al. of France in 1978 conducted a study on the I.Q. scores of children adopted by family from high socio-economic status. These I.Q. scores were compared to those of their siblings' scores who had not been adopted. The average I.Q score of adopted children was 111 and it was higher scorer in comparison to their siblings 95. The study proved that good environment can enhance the level of I.Q.

In 1984, Gottfried carried out a study and concluded that if the children are subjected to certain forms environmental stimulation during the early stages of life span, their intellectual development gets adversely affected

McGue & others in 1993 studied on identical twins. Identical twins were taken from both the groups means twins reared apart and twins reared in same environment. The result showed that the twins reared apart have less similar level IQ's than identical twins reared in the same environment.

Ceci in 2001 found that school attendance has an impact on development of intelligence or in improving I.Q. scores.

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In this way, some factors such as family, education, enriched social environments, nutrition, and peer groups have all been linked to differences in IQ. As for example, a child may be born with genes for brightness, but if that child grows up in a deprived environment where he is malnourished and lacks access to educational opportunities, he may not score well on measures of IQ.

(c) **The Interaction approach** of intelligence views that heredity and environmental effect on intelligence development cannot be separated. In order to study the impact of environment on intelligence, we have to take subjects with the same heredity. After keeping them in different environments comparison can be made. Again the thing is same for studying the impact of heredity on intellectual development. Here the environmental factors must be identical and individuals of different heredity are brought up in same environment and scores are compared. The discussion done above makes it clear that heredity and environment are not separable. So, the conclusions we can draw is that all the qualities of life are in the heredity and all the evocations of qualities depend on the environment. In this way both heredity and environment are two ultimate determinants of every individual.

CHECK YOUR PROGRESS

Que.3: Watson was a supporter of environmental approach.

(Write 'True' or 'False'.)

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Que.4: Write the meaning of the term heredity.

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1.6 Summing Up:

In this unit, we have discussed the following main points—

- Concept of intelligence as a general mental ability of an individual to do act purposefully, to think rationally and to deal effectively with the environment. It is the ability to undertake activities that are difficult, complex and abstract and which are adaptive to a goal, and are done quickly and which have social value and which lead to the creation of something new and different
- We have also discussed the Role of Heredity and Environment on Intelligence. The discussion and controversy on relative role of heredity and environment on intelligence has given rise to three approaches:
 - (a) The first one is extreme genetic determinism approach according to which intelligence differs in individuals due to genetic inheritance.
 - (b) Secondly, extreme environmentalism approach which considers difference in intelligence in different individuals is because of quality of environment of children and
 - (c) The interaction approach which adopts the view that differences between individuals are the outcome of interactions between heredity and environment.

1.7 Questions and Exercises:

1. Explain the role of heredity on intelligence development.
2. Discuss the influence of environment on intelligence.

1.8 References and Suggested Readings:

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UNIT- 2 TYPES OF INTELLIGENCE

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Unit Structure:

- 2.0 Introduction
- 2.1 Objectives
- 2.2 Social intelligence
- 2.3 Cultural intelligence
- 2.4 Emotional intelligence
- 2.5 Multiple intelligence
- 2.6 Summing Up
- 2.7 Questions and Exercises
- 2.8 References and Suggested Readings

2.0 Introduction:

Various psychologists are of the view that intelligence is not a concept of single component. At different times, different theories are being developed by different persons. Some persons explain it from social perspective, some explain from emotional perspective some explain as an abstract concept, etc. So, in this unit, we will discuss the various types of intelligence like, multiple intelligence, Social intelligence, Cultural intelligence and Emotional intelligence, etc.

2.1 Objectives:

After going through this unit, you will be able to —

- *explain* the concept of social intelligence,
- *understand* what cultural intelligence is?
- *describe* the need of studying emotional intelligence,
- *understand* the concept of multiple intelligence.

2.2 Social Intelligence:

Social intelligence is one of different clusters of “Intelligence” which means the capacity to know oneself and capacity to interact with other people effectively understanding them very well. Simply it means the ability to know oneself as well as the ability to know others. An individual’s proficiency at social skills and social behaviour is known as social intelligence. It mainly refers to the “street smart” and ‘common sense’ quality of a person. Influence of environmental factors is very important in the development of social intelligence. It is not acquired by birth. Verbal and communication skills contribute a lot in the development of this skill. Thorndike in the year 1920 formulated this concept for the first time and defined that social intelligence is the ability to understand men and women, boys and girls, to act wisely in human relations.

The term “competency” is associated to describe the meaning of social intelligence clearly. It refers to the ability or competency to understand someone’s environment and healthy reaction capacity of a person to others for the sake of sound social environment. Healthy reaction means that type of behaviour which does not disturb the interpersonal relationships of people in a society. According to Social Scientist **Ross Honeywill**, “Social intelligence is an aggregated measure of self and social awareness, evolved social beliefs and attitudes, and a capacity to manage complex social change.”

Being able to effectively communicate with a wide range of people in various settings is an important indicator of proficient social intelligence. Behaving appropriately in social settings is also an important quality which includes knowledge of social norms and rules.

Another integral component of social intelligence is to be a good listener.

Social intelligence is correlated with emotional intelligence in that way, because of which a person is able to read others’ emotions and feel empathy for other people. Social intelligence is a developed and learned skill; it is not inherited by birth. It can be improved by an individual taking action and working on all their social components.

The key elements of Social intelligence are—

- (a) Verbal fluency or conversational skill
- (b) Knowledge of Social roles, rules and scripts
- (c) Effective listening skill
- (d) Understanding others feeling and thinking
- (e) Role playing and self-efficacy skill
- (f) Impression management skill

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CHECK YOUR PROGRESS

Que.1: Define Social intelligence.

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Que.2: Mention any three key elements of social intelligence.

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2.3 Cultural Intelligence:

Cultural Intelligence is a new concept that refers to a multidimensional construct comprising of an individual’s ability to function and manage effectively in diverse cultural settings. It can be conceived as an aggregate multidimensional composition of a person’s ability to act or accomplish task effectively in different cultural set up. **Cultural intelligence** is the capability to relate and work effectively across cultures, bearing similarity to the term cultural Quotient. In the year 2003, Christopher Earley and Soon Ang

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originated the term 'cultural intelligence' in the book *Cultural Intelligence: Individual Interactions Across Cultures* and abbreviated the concept as "CQ". According to Earley and Ang, "Cultural Intelligence is a person's capability to adapt as s/he interacts with others from different cultural regions and has behavioural, motivational, and meta-cognitive aspects."

According to Van Dyne, & Livermore, there are four kinds Cultural Quotient capabilities which are-(a) motivation (CQ Drive), (b) cognition (CQ Knowledge) (c) meta-cognition (CQ Strategy) and (d) behavior (CQ Action).

Motivation (CQ-Drive): CQ-Drive refers to an individual's interest and confidence to work effectively and efficiently in culturally diverse set-up. It includes-

- ✓ Intrinsic motivation of the person means deriving enjoyment even from culturally diverse experiences also.
- ✓ Extrinsic motivation of the person- means gaining benefits from culturally diverse experiences.
- ✓ Self-efficacy – having the confidence to be effective in culturally diverse situations

Cognition (CQ-Knowledge): It is a person's knowledge about how cultures are similar and how cultures are different place to place, institution to institution. It includes:

- ✓ knowledge of economic and legal systems
- ✓ knowledge about values, social interaction norms, and religious beliefs and
- ✓ Socio-linguistics aspect that means knowledge about rules of languages and rules for expressing non-verbal behaviors

Meta-cognition (CQ-Strategy):

CQ-Strategy or Meta cognition means how an individual person perceives or makes sense of various experiences experienced in different cultural set-up. It happens through accumulation and adaptation process of human being

by making judgments of own thought processes and others. Meta cognition includes:

- ✓ Awareness of a person’s own cultural knowledge
- ✓ Planning or making strategy before a culturally diverse encounter
- ✓ Checking assumptions and adjusting mental maps when actual experiences differ from expectations.

Behaviour (CQ-Action):

CQ-Action is a person’s capability to adapt verbal and nonverbal behavior to make it appropriate to diverse cultures. It involves having a flexible repertoire of behavioral responses that suit a variety of situations. It includes both verbal and non-verbal behaviour. Verbal means modifying verbal behaviors (e.g., accent, tone) and Non-verbal means modifying non-verbal behaviors (e.g., gestures, facial expressions).

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CHECK YOUR PROGRESS

Que. 3: Enumerate the concept of Cultural Intelligence.

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Que. 4: Explain briefly on the four kinds of CQ capabilities.

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2.4 Emotional Intelligence:

Concept: Emotional Intelligence is a combined concept of two different elements- one is Emotion and the other is Intelligence. So, in order to understand the concept of emotional intelligence, at first we must know the meaning of these two terms.

Emotions play a vital role in regulating the behaviour and activities of human being. Emotions are indispensable part of our life. Sometimes we consider emotions to be the driving force or we may say living force in guiding our behaviour. The term emotion has been derived from the Latin root “emovere” which means “to stir up” or “to excite”. So, from this etymological meaning, emotion means to be stirred up or excited state of an individual. It can be described as the agitating or excited state of our mind and body. It refers to some sort of affective experiences characterized by physiological changes that lead to perform some acts which are little bit different from normal behaviour. Love, Anger and Fear are the three basic emotions of a child. Normally, emotions are associated with instincts and this is vice versa.

Intelligence is the ability to do, ability learn and ability to think. It is the aggregate or total capacity of an individual with the help of which the person can acquire new knowledge. It is adaptability of a person because of which he can cope up in any kind of new situation.

So, the concept of Emotional Intelligence has been emerged by combining these two concepts- emotion and intelligence. Like general intelligence, emotional intelligence is also the product of a person’s own heredity and its interaction with his environmental forces. Peter Salovey and John Mayer, these two researchers introduced this concept of Emotional Intelligence and it was popularized by Daniel Goleman in his book “Emotional Intelligence” published in the year 1996. It is the ability to recognize, understand and manage one’s own emotion along with recognizing, understanding and influencing the emotions of others. Emotional intelligence has been defined as “the ability to monitor one’s own and other people’s emotions, to discriminate between different emotions and label them appropriately, and to use emotional information to guide thinking and behavior” by Peter Salovey and John Mayer. Emotional intelligence is the

ability to perceive emotion with proper justification, integrating it with thought process, understanding emotion and also the capacity to manage it with rationalization power.

There are total five basic Components of Emotional Intelligence which are–

- (a) **Self-awareness:** Self-awareness is the ability to understand and recognize one's own emotions. Apart from recognizing and understanding one's own emotion, it also refers to being aware of the effect of one's mood, actions and emotions upon others. Self-aware individuals also recognize the relationships between the things they feel and how they behave. These individuals are also capable of recognizing their own strengths and limitations, are open to new information and experiences, and learn from their interactions with others.
- (b) **Self-regulation:** Self regulation refers to expression of one's own emotions at right time, right place and in right platform. It is all about the expression of someone's own emotions appropriately.
- (c) **Empathy:** Empathy means the ability to understand another individual's feeling. Besides understanding another person's feeling, it also covers what type of responses should be shown by people after knowing emotions.
- (d) **Motivation:** Motivation is a driving force of individual which intends us to do or to act. Emotionally intelligent people have a passion to fulfil their own inner needs and goals instead of doing tasks for fame, money and recognition. They seek things that lead to their internal rewards
- (e) **Social Skills:** Socials skills mainly meant the ability of communication or interaction of individuals with others in society. To be emotionally intelligent- active listening quality, verbal communication skills, leadership and persuasiveness etc. which are some examples of social skills must be available with the person.

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STOP TO CONSIDER

- Emotional intelligence is the ability of a person to understand and control his own emotion as well as the ability to understand others emotions also.
- Total five basic components of emotional intelligence are- self awareness, self-regulation, empathy, motivation and social skills.

2.5 Multiple Intelligence (MI):

Concept: Dr. Howard Gardner, a professor of education at Harvard University developed the theory of multiple intelligence in the year 1983. As a result of development in recent cognitive research this theory has emerged. According to this theory, students possess different kinds of minds and therefore learn, remember, perform, and understand in different ways.

This theory states, *“We are all able to know the world through language, logical-mathematical analysis, spatial representation, musical thinking, and the use of the body to solve problems or to make things, an understanding of other individuals, and an understanding of ourselves. Where individuals differ is in the strength of these intelligences - the so-called profile of intelligences -and in the ways in which such intelligences are invoked and combined to carry out different tasks, solve diverse problems, and progress in various domains.”*

So, Professor of Psychology Dr. Gardner proposes nine different intelligences. Those nine intelligences and their nature in Multiple Intelligence (MI) theory can be explained in the following way-

- **Linguistic intelligence** (word skill dominated): They have well-developed verbal skills and sensitivity to the sounds, meanings and rhythms of words

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- **Logical-mathematical intelligence** (number/reasoning smartness): These people have the ability to think conceptually and abstractly, and capacity to discern logical or numerical patterns.
- **Spatial intelligence** (picture smartness): Children of this category have the capacity to think in images and pictures, to visualize accurately and abstractly.
- **Bodily-Kinesthetic intelligence** (body skills dominated): Ability to control one's body movements and to handle objects skillfully.
- **Musical intelligence** (music smartness): Such types of people possess the ability to produce and appreciate rhythm, pitch and timber.
- **Interpersonal intelligence** (smartness related to deal with people): This is the capacity to detect and respond appropriately to the moods, motivations and desires of others
- **Intrapersonal intelligence** (self smart): Capacity to be self-aware and in tune with inner feelings, values, beliefs and thinking processes.
- **Naturalist intelligence** (nature smart): Ability to recognize and categorize plants, animals and other objects in nature
- **Existentialist** (deep thinking Skill): They have sensitivity and capacity to tackle deep questions about human existence, such as the meaning of life, why do we die, and how did we get here.

Among these nine, the first seven were introduced in the year 1983. Later, in 1999 the last two were newly added by Gardner. All the nine intelligences of MI theory and their skills with career preferences can be presented with the help of the following table—

	Intelligence	Skills and Career Preferences
1.	Verbal-Linguistic Intelligence	Skills - Listening, speaking, writing, teaching. Careers - Poet, journalist, writer, teacher, lawyer, politician, translator
2.	Mathematical-Logical Intelligence	Skills - Problem solving (logical & math), performing experiments Careers - Scientists, engineers, accountants, mathematicians
3.	Musical Intelligence	Skills - Singing, playing instruments, composing music Careers - Musician, disc jockey, singer, composer
4.	Visual-Spatial Intelligence	Skills - puzzle building, painting, constructing, fixing, designing objects Careers - Sculptor, artist, inventor, architect, mechanic, engineer
5.	Bodily-Kinesthetic Intelligence	Skills - Dancing, sports, hands on experiments, acting Careers - Athlete, PE teacher, dancer, actor, firefighter
6.	Interpersonal Intelligence	Skills - Seeing from other perspectives, empathy, counseling, co-operating Careers - Counselor, salesperson, politician business person, minister
7.	Intrapersonal Intelligence	Skills - Recognize one's strengths and weaknesses, reflective, aware of inner feelings Careers - Researchers, theorists, philosophers
8.	Naturalist Intelligence	Skills - Recognize one's connection to nature, apply science theory to life Careers – Scientist, naturalist, landscape architect
9.	Existential Intelligence	Skills – Reflective and deep thinking, design abstract theories Careers – Scientist, philosopher, theologian

Educational Significance of MI Theory:

In our educational institutions, much more emphasis is given on academic development of children. Along with scholastic development, our society as well as school mostly gives attention on the linguistic and logical-mathematical intelligence. In this traditional concept of educational system, some other types of people who possess different types of potentials are always ignored. But Prof. Gardner says that any kind of educational institution must pay equal level attention to those children who are genius in art, music, architecture or may be in bodily activities. Therefore he states that - *“We should also place equal attention on individuals who show gifts in the other intelligences: the artists, architects, musicians, naturalists,*

designers, dancers, therapists, entrepreneurs, and others who enrich the world in which we live.”

But very unfortunately, it is seen that there are lots of children who are not getting the opportunity for development of their potentials in spite of having these gifts from God. Many children have these gifts means latent talents but don't receive much reinforcement for them in school. Many of these kids, in fact, end up their schooling being labeled “learning disabled,” When the unique ways of thinking and learning of these children aren't according to the nature of a heavily linguistic or logical-mathematical classroom, then they are called as “ADD” (Attention Deficit Disorder) or simply underachievers.

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CHECK YOUR PROGRESS

Que. 5: Who introduced the Multiple Intelligence theory?

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Que. 6: How many intelligence are there in M.I. theory?

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The theory of multiple intelligence proposes a major transformation in the way our schools are run. It suggests that teachers must be well trained to present their lessons in a wide variety of ways using music, cooperative learning, art activities, role play, multimedia, field trips, inner reflection, and much more. The good news is that the theory of multiple intelligences has grabbed the attention of many educators around the country, and hundreds of schools are currently using its philosophy to redesign the way it educates

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children. The bad news is that there are thousands of schools still out there that teach in the same old dull way, through dry lectures, and boring worksheets and textbooks. The challenge is to get this information out to many more teachers, school administrators, and others who work with children, so that each child has the opportunity to learn in harmonious ways with their unique minds.

2.6 Summing Up:

The whole discussion of this unit may be summed up briefly in the following points—

- Social Intelligence as the capacity to know oneself and capacity to interact with other people effectively understanding them very well.
- cultural intelligence as an aggregate multidimensional composition of a person's ability to act or accomplish task effectively in different cultural set up
- Emotional Intelligence which refers to the ability of controlling one's own emotion and understanding others also. There are total five basic components of emotional intelligence which are- self awareness, self-regulation, empathy, motivation and social skills.
- The theory of Multiple Intelligence as stated by Dr. Gardner. In this theory, he proposes nine different intelligences which are –linguistic, logical or mathematical, kinesthetic, spatial, musical, inter personal, intra-personal, naturalist and existential types

2.7 Questions and Exercises:

1. Explain the concept of social intelligence.
2. What is cultural intelligence?
3. Describe the need of studying emotional intelligence.
4. Explain the concept of multiple intelligence.

2.8 References and Suggested Readings:

- Armstrong, Thomas (2018). *Multiple Intelligences*. American Institute for Learning and Human Development. (www.institute4learning.com)
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UNIT- 3

PIAGET'S THEORY

Unit Structure:

- 3.0 Introduction
- 3.1 Objectives
- 3.2 Piaget's Theory
- 3.3 Educational Implications of Piaget's Theory
- 3.4 Summing Up
- 3.5 Questions and Exercises
- 3.6 References and Suggested Readings

3.0 Introduction:

Jean Piaget, a Swiss Psychologist developed a theory of Intelligence in 1936 which is known as cognitive theory. It was the first theory to make systematic study on cognitive development of children. Because of his tremendous contribution in this field, Jean Piaget is called as the father of child psychology. Here, in this unit we will discuss this theory by Piaget focusing on its educational implications.

3.1 Objectives:

At reading this unit, you will be able to—

- *understand* the basic components of intelligence development as suggested by Piaget,
- *describe* the various stages of intellectual development in Piaget's theory,
- *comprehend* the educational implications of this cognitive theory.

3.2 Piaget's Theory:

According to Piaget, children are born with a very basic mental structure based on which all subsequent learning happens. The very purpose of this theory is to explain the mechanism and process by which an infant becomes a child, after that a child develops to an individual having thinking and reasoning capacity.

To understand this theory, we have to study three basic aspects or components suggested by Piaget. They are-

- (i) Schemas
- (ii) Adaptation processes and
- (iii) Stages of cognitive development

❖ **Schema:**

A schema can be defined as a set of linked mental representations of the world, which we use both to understand and to respond to situations. A schema represents a unit of one's cognitive structure in the form of general potential to perform some kind of particular behaviour. As for example, infants' initial cognitive structure incorporates only those cognitive abilities or potentials which help them to do their necessary acts like grasping objects, sucking mother's nipple, etc. Here, sucking schema refers to one's general cognitive ability or potential to suck objects. In this way, various schemas with their contents form the basic structure of children mind. He said that as a child gets older - his or her schemas become more numerous and elaborate. When children grow, they come to contact of physical and social environment. As a result they are able to form different schemas and it leads to change and modify their cognitive structure. The assumption is that we store these mental representations means "Schemas" and apply them when needed.

❖ **Intellectual growth as a process of Adaptation:**

According to Piaget, intellectual growth is a process of adaptation means adjustment to this world. This adaptation happens through

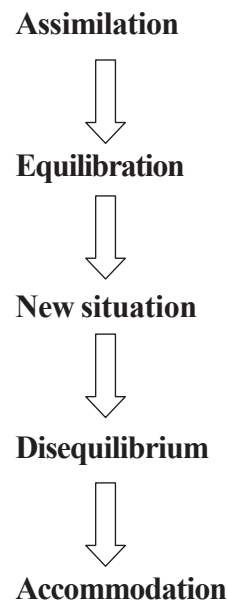
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Assimilation, Accommodation and Equilibration. Assimilation means the use of existing knowledge (schema) to deal with a new object or situation. It is a matching act between already existing schema and new environmental needs.

Accommodation refers to that situation when the existing knowledge (schema) does not work to deal with a new situation and it needs to be changed. In the process of accommodation, one has to learn new ways of thinking and behaving by making changes in one's existing cognitive structure.

Equilibration means a balanced or harmonious relationship between the child and his environment. Piaget asserted that the process of assimilation and accommodation helps the child to maintain a harmonious relationship between himself and his environment. This adaptation mechanism is nothing but Equilibration. It is the force which drives the learning process as we do not like to be frustrated and want to maintain balance by mastering the new challenge (accommodation).

This adaptation process of intellectual growth can be shown with the help of the following chart—



❖ **Stages of Cognitive Development:**

Piaget proposed four stages of intellectual development which are-

- (i) Sensori-motor stage (From birth to 2 years)
- (ii) Pre-operational stage (From 2 to 7 years)
- (iii) Concrete operational stage (From 7 to 11)
- (iv) Formal operational stage (From 11 to adolescence and adulthood)

According to Piaget, children's intellectual development is a matter of biological maturation and interaction with the environment. He never claimed that all children reach a particular stage at a definite age. He just gave indication of ages at which the average child can reach each stage. The descriptions of each stage are discussed below.

(i) Sensori-Motor Stage (From birth to 2 years)

Characteristics of Sensori-motor stage are–

- (a) The child cannot acquire language skill at this stage. It is characterized by absence of language.
- (b) This stage is confined to infants' knowledge gained through motor and sensory interaction with the environment.
- (c) This stage is characterized by a limited number of uncoordinated reflexes like sucking, looking, reaching and grasping by the neonates.
- (d) The main achievement during this stage is 'object performance'. Object performance means the child knows that the thing/object still exists even if it is hidden.
- (e) By the end of the Sensori- motor period children develop a permanent sense of self and object.

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STOP TO CONSIDER

- Piaget's theory of intelligence is based on stages not on age.
- Total four stages of intellectual development are found in Piaget's theory which are- (a) Sensori-motor stage (b) Pre-operational stage (c) Concrete operational stage and (d) Formal operational stage

(ii) Pre-Operational Stage (From 2 to 7 years)

During this stage the young children starts to think symbolically. He begins to ask for something through language ability rather than just reaching out the object. Pre-operational stage can again be subdivided into two- (a) Symbolic function sub-stage and (b) Intuitive phase.

(a) Symbolic function sub-stage which is also known as pre-conceptual phase comprises of approximately two to four years of age. At this stage, children cannot yet manipulate and transform information in a logical way. Their thinking is quite illogical. However, they now can think in images and symbols. Other examples of mental abilities are language and pretend play. Symbolic play is when children develop imaginary friends or role-play with friends. Children's play becomes more social and they assign roles to each other. Some examples of symbolic play include playing house, or having a tea party. The type of symbolic play in which children engage is connected with their level of creativity and ability to connect with others. Another characteristic of this stage is that children's intellectual structure is ego-centric in nature. Egocentric means children see the world from their own standpoint.

(b) Intuitive phase period is between the four to seven years. At this period, children tend to become very curious and ask many questions. They start to question by use of primitive reasoning. Irreversibility is a concept associated with this stage which is closely related to the ideas of centralization and conservation. Irreversibility refers to when children are unable to mentally reverse a sequence of events. In case of them, running from X to Y may not carry the

same meaning as running from Y to X. Children show a marked inability to conserve continuous quantity.

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(iii) Concrete Operational Stage (7 to 11 years)

Characteristics of concrete operational stage are-

- (a) Children begin to work with logical or operational thought.
- (b) Children learn to deal with concepts and ideas which are in mental terms. This means child can work things out, internally in their head beyond their physical world.
- (c) Children can think in terms of a set of interrelated principles rather than single bits of knowledge.
- (d) Their ego-centric style of children thinking gets eliminated at this stage.
- (e) The child develops the ability to conserve number, mass and weight both in terms of quantity and number of objects. He can think that change in appearance of an object may not alter its quantity.

(iv) Formal Operational Stage (From 12 years to adolescence)

Formal operational stage is the final stage of intellectual development according to Piaget. The main characteristics of this stage are-

- (a) At this stage people develops the ability to think abstract concepts and logically tests hypotheses.
- (b) Creative aspects or talents become very much visible within the children at this stage.
- (c) Hypothetical and deductive reasoning is possible by children at this point.

Piaget stated that after the expiry of all these stages one by one, the child is supposed to reach the full intellectual potential. A person may discover the solutions of any problem through mental manipulation of symbols, through scientific thinking and through hypothetical analysis.

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CHECK YOUR PROGRESS

Que.1: What are the basic components of Piaget’s theory?

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Que. 2: Write any two characteristics of Sensori-motor stage.

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3.3 Educational Implications of Piaget’s theory:

- Piaget’s theory provides valuable information and advice on curriculum planning and structuring the schemas.
- Learning and development are the net result of interaction between a person’s cognitive structure and functioning of their children. This type of knowledge may prove quite beneficial to them in dealing with the children and planning their training and education.
- It focuses on child centred education by giving educational experience suitable to learners cognitive structure.
- Useful in providing learning experiences in tune with the mental abilities of the child.
- Emphasis on discovery approach in learning.
- Curriculum should provide specific educational experience based on children’s developmental level.
- Arrange classroom activities so that they assist and encourage self learning.

- Do not treat children as miniature adult; they think and learn differently from adults.
- Practical learning situations.
- Simple to complex and project method of teaching.
- Co-curricular activities have equal importance as that of curricular experiences in the cognitive development of children.
- Major goals of education are equal to the creative and critical thinking.

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3.4 Summing Up:

- In this unit we have discussed the theory of Intellectual Development by Jean Piaget.
- Schemas, Adaptation processes and Stages of cognitive development are the three basic aspects of this theory.
- Piaget proposed that there are four stages of intellectual development of a child which are- Sensory-motor stage (From birth to 2 years), Pre-operational stage (From 2 to 7 years), Concrete operational stage (From 7 to 11 years) and Formal operational stage (From 12 years to adolescence and adulthood).

3.5 Questions and Exercises:

1. Describe the various stages of intellectual development in Piaget's theory.
2. Explain the educational implications of this cognitive theory.

3.6 References and Suggested Readings:

- Armstrong, Thomas (2018). *Multiple Intelligences*. American Institute for Learning and Human Development. (www.institute4learning.com)

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- Bhatia, H.R. *Elements of Educational Psychology*.
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UNIT- IV CREATIVITY

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Unit Structure:

- 4.0 Introduction
- 4.1 Objectives
- 4.2 Meaning of Creativity
- 4.3 Nature and Characteristics of a Creative Person
- 4.4 Role of Teacher in nurturing Creativity
- 4.5 Summing Up
- 4.6 Questions and Exercises
- 4.7 References and Suggested Readings

4.0 Introduction:

The concept of creativity occupies a very important place in the field of educational psychology. If we open the pages of history, we will find several philosophers, poets, artists who were not bright in their academic life but were great man because of their innovative or creative works in this world. So, in this unit we will learn about what creativity is, what are the characteristics of a creative person and what role should be played by teachers to foster creativity among school children in school premises.

4.1 Objectives:

At the end of this unit, you will be able to—

- *understand* the concept of creativity,
- *know* the nature of creative children,
- *describe* the role of teachers to promote creativity within children.

4.2 Meaning and Definitions of Creativity:

Creativity means uniqueness, original thinking, and new types of associations, divergent thinking, and new types of solutions to old problems. Simply it refers to newness in activity, thought and ideas. Creativity is the ability to make or otherwise bring into existence something new, whether a new solution to a problem, a new method or device, or a new artistic object or form. Creativity means having flexibility in applying new approach in different fields of life. Psychologists have explained various definitions to explain the concept of creativity. Let us go through various definitions of creatives.

In the words of **Carl Rogers**, “Creativity is an emergence in action of novel relational product growing out of the uniqueness of the individual on the one hand, the materials, events, people or circumstances of his life on the other.”

Simpson defines, “Creative thinking involves new form of thinking away from the traditional forms. Thus creativity includes curiosity, imagination, research, novelty and invention etc.”

According to **Guildford**, “Creativity sometimes refers to creative potential, sometimes to creative production and sometimes to creative productivity.” Here, creative potential means the personal dispositions of the individual in which there are some more or less permanent qualities which help in innovative thinking. Creative thinking leads to new ideas. Creative production does not mean production of concrete objects or materials. It means the process of productive thinking. Again the last part of the definition is saying about creative productivity. It means productivity according to socially approved or confirmed forms of words, thoughts and phrases, etc.

Torrance said, “I have chosen to define creative thinking as the process of sensing gaps or disturbing, missing elements, forming ideas or hypotheses, and communicating the results, possibly modifying and retesting the hypotheses.” In this definition Torrance said that Creativity involves new hypotheses, their tests and constant modification. In this process, first of all, a need is felt, then the problem is defined and clarified. After this, there is a period of preparation which involves reading, writing, discussion

and analysis and gathering possible solutions of the problems. Then the advantages and disadvantages of different solutions are evaluated. At the end of this process, new ideas come to light in the form of insight and this is nothing but creativity.

According to **Sir Fredric**, “Creativity refers to bold thinking. Bold thinking means divergent thinking, breaking of old norms, having new experiences and creating new combinations.”

In the words of **Stanger and Karwoski**, creativity implies the production of a ‘totally or partially’ novel identity.

Spearman defines Creativity as “power of the human mind to create new contents by transforming relations and thereby generating new correlates.”

Psychologist **Stein** defined, “Creativity is a process which results in novel work that is accepted as tenable to useful or satisfying to a group of people at some point in time.”

From all these above cited definitions, it can be pointed out that creativity is the ability or capacity of an individual to create, discover, or produce a new or novel idea or object, including the rearrangement or reshaping of what is already known to him which proves to be a unique personal experience. The most important traits of creativity are consciousness of the problem, continuity of thinking, continuity of words, continuity of association, continuity of expression, flexibility of thinking and accommodation, originality and re-definition, etc.

4.3 Nature and Characteristics of Creative Persons:

After going through this meaning and definitions, nature and characteristics of creativity can be well derived. Different theories have explained the nature of creativity in different ways. The psycho-analytic approach says that the creative persons satisfy frustrated ambitions and desires through creative processes. According to associative theory, the creative persons form new associations or recognize old ones in innovative ways. In the view of Gestalt theory, creative thinking involves change of

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central point, change of meaning and a novel organization. It involves insight which is the cause of sudden emergence of new ideas. Each approach clarifies a particular aspect of creativity in better way than the others. However, all psychologists more or less agree to say that it is a unique and novel personal experience. The nature and characteristics of creativity can be better explained with the help of the following points: —

- (i) **Progressive or Dynamic Thinking:** Thinking of a creative person constantly changes according to the new circumstances. Creative persons possess more capacity of adjustment but this adjustment is sought through new combinations.
- (ii) **Problem Awareness and Commitment towards it:** Without commitment towards the problem, no individual can have creative thinking and before commitment the person should have awareness of the problem. After knowing the problem, every effort is given to find out the new solution to the problem which is called commitment.
- (iii) **Creativity is Personal as well as Universal:** The most important trait of creativity personality is capacity of original thinking with independence of judgement capacity. So, one's independent thinking cannot be of another person. Hence, it is personal. Creativity is also characterised as universal since it is not bound by the barriers of age, caste, creed, sex, location or culture. Every human being possesses the capacity of demonstrating creativity to some degree.
- (iv) **Possess Divergent Thinking:** Creativity is often characterized by divergent thinking, not convergent thinking. Convergent thinking refers to that thinking which is done as per approved social behavioural norms applying traditional methods of solutions. But divergent thinking is open thinking that applies originality, flexibility and continuity.
- (v) **Innate as well as Acquired Ability:** Though creativity is very often explained as God-gifted natural endowment but researches have proved that proper cultural environment, education and training also promotes creativity within children.

- (vi) **Creative Individuals are Close to Novelty:** Creativity is very closely related to the ability of a person to produce something in new way partially or as a whole. It never accepts repetition or reproduction of anything what has already been done by an individual. So, novelty or newness is one of the basic natures of creativity.
- (vii) Creative persons pursue the originality of ideas and expression in their works.
- (viii) **Creative individuals carry Ego involvement:** One's individuality and identity are totally merged in one's new creation. Normally, the creator takes pride in every creation and is reflected in behavioural statements like, "I have done it", "It's my idea", etc.
- (ix) **Flexibility:** Flexibility of thinking in a creative person allows him or her to develop and adopt new attitude, idea or behaviour.
- (x) Ability to go beyond the Immediate Circumstances is one of the prominent natures of creative individuals.
- (xi) **Harmony of Abnormal and Relevant thinking:** Guilford said that creative individuals are capable to accommodate with relevant but abnormal thinking with the help of their creativity, reasoning and power of imagination.
- (xii) Originality is an essential condition of creativity. Creative person applies new ideas, methods and attitudes to solve problems.

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STOP TO CONSIDER

- Creativity is the ability or capacity of an individual to create, discover, or produce a new or novel idea or object, including the rearrangement or reshaping of what is already known to him.
- All psychologists are agreeing to say that creativity is a unique and novel personal experience of an individual.
- Creative persons pursue the originality of ideas and expression in their works.

4.4 Role of Teacher in Nurturing Creativity:

Creativity can be fostered within the young children by giving proper nurturing environment. We may discuss the following aspects as role of teachers for promoting creativity in children within school premise.

1. Active learning of students by application various innovative methods.
2. Use of technological tools and devices to the students.
3. Creating an environment for interaction opportunity among students to initiate problem-solving attitude.
4. Provide them with a lot of opportunities for hands-on fieldwork.
5. Organize round-table discussion with students at free time from time to time for the interesting topics.
6. Promoting questioning habit. Questioning means the power of inquiry not information and this capacity should be promoted by encouraging students to ask for question.
7. Teachers should allow students to create some of the subjective questions for their upcoming examination.
8. Establishing Emotional Connection also creativity can be promoted in students. Various researches have proved that creativity can be cultivated within young student's best through emotional contacts.
9. Classroom activities play a crucial role in cultivating and developing creativity and confidence in the students. Teachers have this responsibility of providing an equal platform to every student in the classroom where each student's voice matters. Therefore, teachers should keep frequent discussion and interactive sessions for students in the classroom.
10. Teachers should make time for activities outside the classroom and provide an informal class opportunity for the students apart from academics. Make a habit of memorizing each student's name meanwhile ensure that every student knows.

11. Adequate freedom should be given to students for responding to a situation. They should be encouraged to think over a problem so that many ideas may come out as a solution to the problem.
12. Removal of hesitation and fear from students' mind can play very influencing role in creativity development. In a multilingual country like India, fear feeling with a sense of inferiority complex and hesitation blocks in creative expression of students. So, teachers role in this regard is very important.

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CHECK YOUR PROGRESS

Que.1: Enumerate the concept of creativity.

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Que. 2: Describe the nature and characteristics of creativity.

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4.5 Summing Up:

The discussion of this unit can be summed up in the following points briefly—

- Creativity, simply it refers to newness in activity, methods, thought and ideas of a person. It is the ability or capacity of an individual to create, discover, or produce a new or novel idea or object, including the rearrangement or reshaping of what is already known to him which proves to be a unique personal experience.

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- Teachers can play very influencing role to promote creativity within students by giving proper nurturing environment in school.
- Removal of hesitation and fear of feeling from students' mind is also one of the important points to be kept in mind by teachers for creativity development.

4.6 Questions and Exercises:

1. What do you mean by creativity? Describe the nature and characteristics of creativity.
2. Discuss the role of teachers in fostering creativity among students.

4.7 References and Suggested Readings:

- Armstrong, Thomas (2018). *Multiple Intelligences*. American Institute for Learning and Human Development. (www.institute4learning.com)
- Bhatia, H.R. *Elements of Educational Psychology*.
- Chauhan, S.S. *Advanced Educational Psychology* (Sixth revised edition.) Vikas Publishing House PVT LTD. Noida, 1998.
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