BASUDEV GODABARI DEGREE COLLEGE, KESAIBAHAL

BLENDED LEARNING STUDY MATERIALS

UNIT-II

DEPARTMENT :- EDUCATION

SUBJECT :-EDUCATIONAL RESEARCH

SEMESTER :- 1st SEMESTER

CONTENT

INDIVIDUAL DIFFERENCES

Learning Objectives:

- To understand the concept of individual difference
- To know the natures of individual difference
- To understand the role of education towards individual differences

Concept:

Individual variation is a universal phenomenon. It is said that no two individuals are exactly alike they differ from each other in some way or the other. Such a similarity or difference between persons reveals individual differences in the early 1800s. The science of Psychology studies people at three levels of focus captured by the well-known quote: "Every man is in certain respects (a) like all other men, (b) like some other men, (c) like no other man". Individual differences psychology focuses on this second level of study. It is also sometimes called Differential Psychology because researchers in this area study the ways in which individual people differ in their behaviour.

According to the dictionary of Education

1-Individual differences stand for the variation or deviations among individuals in regard to a single characteristic or number of characteristics.

2. It stands for those differences which in their totality distinguish one individual from another.

So, we can say that individual differences is the differences among humans that distinguish or separate them from one another and makes one as a single unique individual. The study of individual differences helps to understand not only what makes humans similar to one

another, but also what makes them different. By considering the variations that can occur from one person to another, one can best understand the full range of human behaviour. Children develop at different rates. This, in turn, creates variations among individuals (i.e., individual differences). Again, these differences can be either qualitative or quantitative. For children in any preschool classroom setting, the differences in temperament, personality, intelligence, achievement, and physical factors such as height and weight, are noteworthy and reflect a wide range of normal variation. Some children grow rapidly and others grow more slowly. There also are racial and gender developmental variations. It is important to understand that the concept of individual differences is the basis upon which one child is compared to another. An understanding of individual differences provides the foundation for recognizing normal variations as well as extreme differences among children and, thus, for identifying those who may have special needs. In general, understanding of the various developmental levels is enhanced by familiarity with the concept of individual differences Each student is a unique individual, different in cognitive and affective development, social maturity, ability, motivation, aspiration, learning styles, needs, interests and potential. Apart from this, there are other factors underlying student differences. These include innate differences in intelligence, differences in social and economic background, variations in past learning experiences, and perhaps variations in the level of congruence between the learner and the curriculum. In view of these factors, catering for individual differences is

intended neither to narrow the gap between individuals nor to even out their abilities and performance. It should aim for understanding why students are able or unable to learn well and finding appropriate ways to help them learn better. The aim of education is to enable each student to attain all-round development according to his/her own attributes. To achieve this, students should be provided with suitable assistance and guidance in accordance with their abilities and learning needs, so that they can develop their potential to the full.

Meaning of individual difference

In education, ever since the most ancient times, students have been differentiated on the basis of age as difference in age levels entitles the children to differing levels of education. As the child's age gradually increases, the subjects of his education can be made more complex and difficult. In addition to differences in age, another factor is the difference in levels of intelligence. Besides this, educational attainments were also considered to be important. In this manner, during the ancient and the medieval periods, individual difference was believed to be the capacity of attaining skills in a particular subject. In modern schools, other kinds of skills and abilities, and peculiarities of personality in individuals are also taken into consideration. According to Skinner, "Today we think of individual differences as including any measurable aspect of the total personality." From this definition of individual differences it is evident that it comprehends every aspect of the human personality, albeit all aspects that is in some manner measurable. Aspects of this nature can be many such

as variability, conformity, difference in the rate of learning and development of mutual relationship between the various characteristics of personality, etc. In this manner, various individual differences of physical and mental development, nature, learning ability, specific abilities, interest and personality, etc.

Definition of individual Difference

Individual differences are the variations from one person to another on variables such as self-esteem, rate of cognitive development or degree of agreeableness. Historically, psychological science has overlooked individual differences in favour of focusing on average behaviour. Differences that separate individual from one another and make one as a unique individual in oneself are termed as individual differences. Osborne considers individual differences as dissimilarity between persons that distinguish them from one another.

1. Drever James:

"Variations or deviations from the average of the group, with respect to the mental or physical characters, occurring in the individual member of the group are individual differences."

2. Good, C.V.:

"The variation or deviations among individual is regard to a single characteristics or a number of characteristics, those differences which in their totality distinguish one individual from another."

3. Skinner, C.E.:

"Today we think of individual differences as including any measurable aspect of the total personality."

4. Woodworth, R.S. and Marquis, D.G.:

"Individual differences are found in all psychological characteristics physical mental abilities, knowledge, habit, personality and character traits."

NATURE OF INDIVIDUAL DIFFERENCES

It has been observed that if we collect information about people's characteristics from a large sample and examine the pattern of distribution we find that a large majority of the people fall in the middle range while a small proportion lies in extreme categories. For example, most of the people fall in the category of average height and very few are very tall or very short. This holds true for many more characteristics including intelligence and other psychological attributes. Fig. 3.1 Distribution of height of a large sample of persons The fact that people are different from each other is a very common observation. The differences in psychological characteristics are often consistent and form a stable pattern. By 'consistent', we mean that people tend to show regularity in their behaviour and their patterns of behaviour do not change very frequently. This consistency and stability in behaviour is unique to every person. People develop their unique traits/ characteristics and patterns of behaviour due to their genetic makeup and the environment in which they are brought up. Once we know these differences systematically we can utilize the capabilities of people efficiently for their healthy development. Knowing about the specific characteristics of a person is necessary in order to extend support and utilize his or her potential to optimal level. Individual differences occur due to interaction of genetic and environmental factors. We inherit certain characteristics from our parents through genetic codes. The phenotype or the expressed forms of our characteristics depend on contributions of the socio-cultural environment.

This is the reason why we are not exactly like our parents and our parents not exactly like our grandparents. We do share similarities with our parents in respect of many physical attributes like height, colour of eyes, shape of nose etc. We also inherit certain cognitive, emotional and other characteristics from our parents like intellectual competence, love for sport, creativity etc. However, our own characteristics develop largely by the support from the environment which we inhabit. The environment is responsible as how we are reared, the kind of atmosphere at house, whether it is liberal or strict, the type of education that we get, what we learn from people, around us, books, cultural practices, peers, teachers and media All these aspects refer to 'environment' which help in developing our potentials. Environment, by providing models and other opportunities, helps us develop many traits and skills. Our inheritance alone cannot decide what we become but our environment also contributes. We know the example of Dr. Babasaheb Ambedkar, who was born in a very poor family but, with the right education and environment, became a great lawyer and also designed the Constitution of India. The latest and most well known example would be of our former President Dr. A.P.J. Abdul Kalam. You can also remember many such examples, who did not become great because of inheritance but because of the environment. Now you know that our genetic codes vary. At the same time, surrounding environment also differs from person to person. It sets limits or defines a range by offering different opportunities. That is why the pattern of development of each of us is different

from others. It makes us think why we are similar in certain ways and different in others.

FACTOR OF INDIVIDUAL DIFFERENCE

1. Race:

The ethnologists have explained many of the supposed differences, and have been inclined to place the various races upon a more equal footing with respect to inborn capacity. There may be some difference in behaviour among different races, but there is little scientific evidence that favours the theory of native differences in mental traits.

The superiority of the Nordic stock in mental ability has been asserted by many, but recent and more accurate investigations tend to show that this so-called superiority is largely the result of environmental conditions.

In America the question of racial superiority has usually narrowed down to the rivalry between the white race and the Negro race. That

the white race is much superior to the Negro race cannot be considered absolutely final. Such conclusion must be tempered by a consideration of the superior intellectual opportunities available to the white Americans.

Differences in mentality, reflecting influence of country and city life, is shown by the study of Negro mentality in relation to time lived in the city. Kleinberg's study shows a distinct improvement in the test performance with increasing length of residence of Negroes in cities. This study suggests that the superiority of city children over rural children is a direct consequence of better cultural opportunities. In causing differences in physical traits this factor is prominent.

2. Sex:

The general results of all studies made point to the fact that the differences between sexes are quite insignificant. In detail, the exact measurements of intellectual abilities show a relatively slight superiority of the women in receptivity of memory, and relatively slight superiority of men in control of movement and in grasp of concrete mechanical situation.Investigations also show an apparent superiority of girls in language and a somewhat better showing of boys in logical processes. In interests, which cannot be definitely measured, the difference would seem to be that women are more interested in people while men are more interested in things. Difference in instinctive equipment is shown by the fact that women excel in the nursing impulses and men in the fighting impulses. As to physical equipment, men are much taller, stronger, and bigger than women. However, girls grow more rapidly than boys, especially before adolescence. The girls reach physiological maturity earlier.

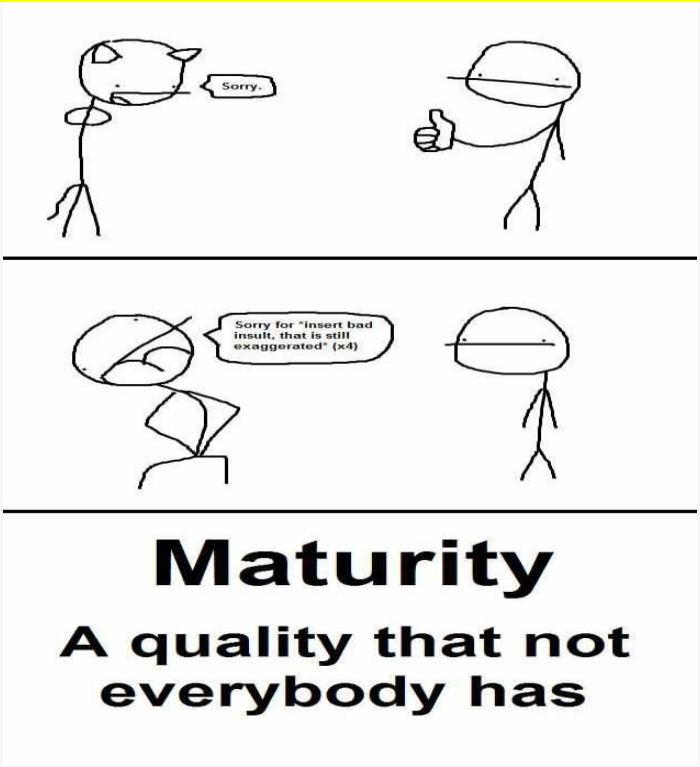
3. Heredity:

By heredity is meant the influence of factors inherent in the child himself from the time he is conceived. Research has shown that heredity proceeds according to certain laws. The first laws of heredity were formulated by Galton who made the direct investigation on heredity.

Gregor Mendel also formulated some well-known laws of heredity. Heredity influences are intrinsic or innate. Individual differences in mental and physical traits are due to heredity and to environmental factors. Heredity as a cause of individual differences may be due either to remote or immediate ancestry. G. R. Conklin has affirmed that although we inherit approximately equally from our parents, we also inherit unequally from our grandparents.

4. Maturity:

Differences in maturity of individuals have always been observed. The pupils in any grade present a considerable range of maturity. The maturity of pupils varies along three lines of development, namely: chronological, anatomical, and organic.



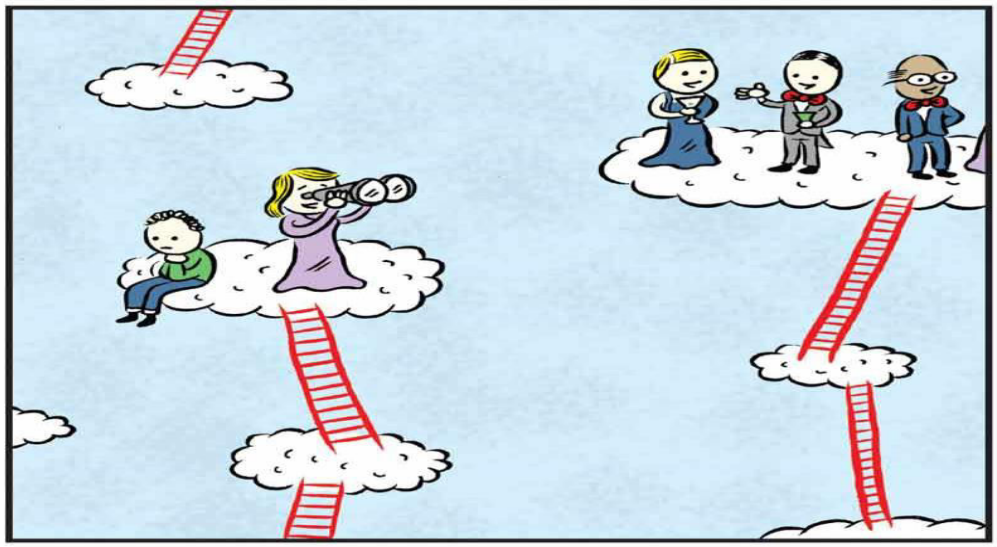
The chronological aspect of maturity is that which is presented by differences in mental development considered in terms of actual number of years. Anatomical growth is shown by different degrees of development of the bones of the skeleton.

Studies made in this line have revealed differences of from two to three years in the anatomical development of the vital organs of circulation and of reproduction. The organs most affected are the organs of the circulatory system and those of reproduction.

Psychological studies reveal that girls mature earlier than boys. It is an accepted fact that the development of an individual is determined by a long interplay of heredity and environment on him.

5. Social and economic status:

On the basis of data supplied by the Army Alpha Test, people living in large center's of population are more intelligent than those living in rural areas; higher intelligence is found along with better educational facilities.



Higher intelligence likewise exists in those states which rank high in their economic condition. There exists a close relationship between occupational socio-economic condition and the general level of intelligence.

Parents found in high occupational levels usually provide good physical and intellectual environments, which favour the speedy cultural development of their children. A considerable body of evidence is available to show that children belonging to the so-called higher social classes are superior in intelligence to those of the lower classes.

6. Motivation and attitude

Without any motivation or positive attitude, there can hardly be a successful process of learning. The question why people learn foreign languages can be put forward. According to Trigos-Gilbert most people nowadays feel the need to speak a new language for personal and professional aims. These aims are the following:

- more employment opportunities;
- better salary prospects;
- higher chances for business success;
- further understanding of someone else's culture.

According to Thanasoulas “ideally, all learners exhibit an inborn curiosity to explore the world, so they are likely to find the learning experience per se intrinsically pleasant. In reality, however, this "curiosity" is vitiated by such inexorable factors as compulsory school attendance, curriculum content, and grades – most importantly, the premium placed on them”. Learner’s motivation and needs have always had a central place in theories of foreign language acquisition. According to Ellis, “motivation and attitudes are important factors, which help to determine the level of proficiency achieved by different learners.” Savignon even declares that “attitude is the single most important factor in second language learning.”

7. Age:

It is matter of common knowledge that age creates differences of mental ability, abilities, physical capacity and maturity etc. in different children.

8. Physical Development:

Differences in height, weight, physical structure and the rate and quantity of development of the different parts of the body lead to differences between individuals.

9. Average Intelligence:

Individuals are seen differing in considerable measure on the basis of their general intelligence (ability to learn).

10. Heredity:

It has now been proved that heredity differences result in the quantity and rate of physical as well as mental development being different in different individuals.

11. Economic Situations:

Economic situations are seen inducing differences in the children’s interests, tendencies, and character etc.

12. Motor Ability:

The individuals movements of the hand and feet and other physical abilities are seen to be varying individuals to much extent, creating different abilities among individuals.

13. Sex Differences:

Although modern psychologists are not prepared to accept sex differences as the criteria of differentiation between boys and girls yet sex does lead to differences between individual even though the family, social and cultural environment may play a major part in it.

14. Emotional Stability:

Due to many physical, mental and environmental factors the emotional stability of individuals is differently affected and this gives rise to differences in their respective natures.

15. Temperament:

Some people are by temperament fast and short tempered while others are secretive, some active and others inactive.

16. Rate of Learning:

Individuals differ from each other because of their attitude and rate of learning, their zeal, rate of progress and transfer of training etc.

17. Environment or Atmosphere:

An individual takes good or bad qualities accruing from a good or bad environment. Generally speaking environment comprehends family, school, neighbourhood, society and culture.

18. Nationality:

Individuals of different countries differ in respect of nature, physical and mental differences interest and personality etc. Because of difference in their cultural and geographic environments.

19. Personality:

Difference in personality gives rise to difference in individual behaviours.

20. Difference of Interests:

Difference in sex, family background, level of development, difference, of nationality race etc. also leads to difference in interests.

21. Situational Variables:

Besides individual variables, situational variables, like work space and layout, design and condition of work equipment, method of work physical environment, character of organization, type of training and supervision, types of invectives, social environment also create individual differences.

Role of education in individual difference

The significance of individual differences in education has long been recognized. The extensive experimental work that has been undertaken, began by Galton and carried on up to the present time, has so increased our knowledge concerning individual differences and has so enhanced their significance to education that their existence and importance are now a matter of general acceptance.

Now knowledge of these differences, their amount, interrelations, and causes, is very important and necessary in planning the education of a particular child. Exact knowledge of just what differences do exist between individuals and of the causes of these differences is important.

Education is furthermore concerned with individual differences resulting from the differing degrees of maturity or growth, and those which previous education and training have caused.

Education can only be made efficient with a minimum of effort, time, and expense by knowledge of which of the differences between people and the achievements of a given person are due to training, and which are due largely to the degree of maturity.

Exact knowledge, not opinion, along all these lines is essential, if progress is to be made. Individual differences must be kept in mind by the teacher if the needs of the individual pupil are to be met. It

should be remembered that physical and emotional differences must be met, as well as intellectual differences.

The teacher must be familiar with many approaches to adjusting the learning situation to the individual needs of the pupil. Any program of instruction must take into consideration the important facts about differences in individuals and traits.

There exists in any realm of activity a wide range in endowments of individuals. However, individuals cannot readily be classified into specific types since the various levels merge gradually and are not sharply differentiated.

The evidence is clear that the degree to which the individual possesses different traits also varies. The wide range of capacities, abilities, needs, and interests in any classroom necessitates a differentiated approach to instruction at all school levels and in all areas of learning.

Until the differences among the pupils in a given class are recognized, instruction cannot be on a sound and systematic basis. A significant part of the dilemma in modern education has been brought about by a failure to admit differences by treating all the pupils alike.

The traditional methods of group teaching have tended to over-emphasize the similarities and to ignore the difference. To ignore the fact that people differ in ability, intelligence, interest, social training, and strength, as well as in age and sex, would be a serious mistake.

MODULE ON INDIVIDUAL DIFFERENCEINDIVIDUAL DIFFERENCE

If training is to be shifted to the nature and needs of the individual, care must be taken to keep the function of the school flexible and adaptable. No child in school can realize his educational growth and development without a carefully planned and administered adjustment so wide individual differences that exist among pupils.

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DEPARTMENT OF EDUCATION

Intelligence

Learning Objectives

- To know the concept and meaning of intelligence
- To know about the nature of intelligence
- To understand the concept of I.Q
- To understand about the theories of intelligence

Intelligence is a key construct employed to know how individuals differ from one another. It also provides an understanding of how people adapt their behaviour according to the environment they live in. In this section, you will read about intelligence in its various forms. Psychological notion of intelligence is quite different from the common sensual notion of intelligence. If you watch an intelligent person, you are likely to see in her/him attributes like mental alertness, ready wit, quickness in learning, and ability to understand relationships. The Oxford Dictionary explains intelligence as the power of perceiving, learning, understanding, and knowing. Early intelligence theorists also used these attributes in defining intelligence. Alfred Binet was one of the first psychologists who worked on intelligence. He defined intelligence as the ability to judge well, understand well, and reason well. Wechsler, whose intelligence tests are most widely used, understood intelligence in terms of its functionality, i.e. its value for adaptation to environment. He defined it as the global and aggregate capacity of an individual to think rationally, act purposefully, and to deal effectively with her/his environment. Other psychologists, such as Gardner and Sternberg have suggested that an intelligent individual not only adapts to the environment, but also actively modifies or shapes it. You will be able to understand the concept of intelligence and how it has evolved, when we discuss some important theories of intelligence.

Intelligence has been defined in many different ways such as in terms of one's capacity for logic, abstract thought, understanding, self-awareness, communication, learning, emotional knowledge, memory, planning, creativity and problem solving. Intelligence is most widely studied in humans, but has

also been observed in animals and in plants. Artificial intelligence is the simulation of intelligence in machines. Within the discipline of psychology, various approaches to human intelligence have been adopted. The psychometric approach is especially familiar to the general public, as well as being the most researched and by far the most widely used in practical settings. Intelligence derives from the Latin verb intelligere, to comprehend or perceive. A form of this verb, intellectus, became the medieval technical term for understanding, and a translation for the Greek philosophical term nous. This term was however strongly linked to the metaphysical and cosmological theories of teleological scholasticism, including theories of the immortality of the soul, and the concept of the Active Intellect (also known as the Active Intelligence). This entire approach to the study of nature was strongly rejected by the early modern philosophers such as Francis Bacon, Thomas Hobbes, John Locke, and David Hume, all of whom preferred the word "understanding" in their English philosophical works. Hobbes for example, in his Latin De Corpore, used "intellectus intelligit" (translated in the English version as "the understanding understandeth") as a typical example of a logical absurdity. The term "intelligence" has therefore become less common in English language philosophy, but it has later been taken up (with the scholastic theories which it now implies) in more contemporary psychology.

Definitions of intelligence

The definition of intelligence is controversial. Some groups of psychologists have suggested the following definitions:

From "Mainstream Science on Intelligence" (1994), an editorial statement by fifty-two researchers: A very general mental capability that, among other things, involves the ability to reason, plan, solve problems, think abstractly, comprehend complex ideas, learn quickly and learn from experience. It is not merely book learning, a narrow academic skill, or test-taking smarts. Rather, it reflects a broader and deeper capability for

comprehending our surroundings—"catching on," "making sense" of things, or "figuring out" what to do.

From "Intelligence: Knowns and Unknowns" (1995), a report published by the Board of Scientific Affairs of the American Psychological Association: Individuals differ from one another in their ability to understand complex ideas, to adapt effectively to the environment, to learn from experience, to engage in various forms of reasoning, to overcome obstacles by taking thought.

Although these individual differences can be substantial, they are never entirely consistent: a given person's intellectual performance will vary on different occasions, in different domains, as judged by different criteria. Concepts of "intelligence" are attempts to clarify and organize this complex set of phenomena. Although considerable clarity has been achieved in some areas, no such conceptualization has yet answered all the important questions, and none commands universal assent. Indeed, when two dozen prominent theorists were recently asked to define intelligence, they gave two dozen, somewhat different, definitions.

Alfred BinetJudgment, otherwise called "good sense," "practical sense," "initiative," the faculty of adapting one's self to circumstances ... auto critique.

David Wechsler: The aggregate or global capacity of the individual to act purposefully, to think rationally, and to deal effectively with his environment.

Lloyd Humphreys "...the resultant of the process of acquiring, storing in memory, retrieving, combining, comparing, and using in new contexts information and conceptual skills."

Howard Gardner To my mind, a human intellectual competence must entail a set of skills of problem solving — enabling the individual to resolve genuine problems or difficulties that he or she encounters and, when appropriate, to create an effective product — and must also entail the potential for finding

or creating problems — and thereby laying the groundwork for the acquisition of new knowledge.

Linda Gottfredson The ability to deal with cognitive complexity. Sternberg & Salter Goal-directed adaptive behavior. Reuven Feuerstein The theory of Structural Cognitive Modifiability describes intelligence as "the unique propensity of human beings to change or modify the structure of their cognitive functioning to adapt to the changing demands of a life situation." What is considered intelligent varies with culture. For example, when asked to sort, the Kpelle people take a functional approach. A Kpelle participant stated "the knife goes with the orange because it cuts it." When asked how a fool would sort, they sorted linguistically, putting the knife with other implements and the orange with other foods, which is the style considered intelligent in other cultures.

Nature of Intelligence

Intelligence is not acquired after sustained labour. It is a gift from nature. Intelligence is not memory. An intelligent person may have poor memory. Intelligence is not a skill which a worker acquires after planned practice. Intelligence is not a guarantee of a good behaviour of the individual.

To understand the nature of intelligence we need to know the classification intelligence as given by E.L. Thorndike and Garret:

1. Concrete Intelligence – It is the ability of an individual to comprehend actual situations and to react to them adequately. The concrete intelligence is evident from various activities of daily life. This type of intelligence is applicable when the individual is handling concrete objects or medicines. Engineers, mechanics and architects have this type of intelligence.
2. Abstract Intelligence – It is the ability to respond to words, numbers and symbols. Abstract intelligence is required in the ordinary academic subjects in the school. This is acquired after an intensive study of books and literature. Good teachers, lawyers, doctors, philosophers etc. have this type of intelligence.
3. Social Intelligence – It means the ability of an individual to react to social situations of daily life. Adequate adjustment in

social situations is the index of social intelligence. Persons having this type of intelligence know the art of winning friends and influencing them. Leaders, ministers, members of diplomatic sources and social workers have it.
Thus we see the nature of intelligence as the ability for adjustment to environment, ability to perceive relationship between various objects and methods, ability to solve problems, ability to think independently, ability to learn maximum in minimum period of time, ability to benefit from one's own experience and the experience of others.

Therefore, intelligence is an inborn ability of an individual, the distribution of intelligence is not equal among all human beings. There is wide individual difference that exists among individuals with regard to intelligence.

The main natures of Intelligence are the following:

1. Intelligence is an innate natural endowment of the child.
2. It helps the child in maximum learning in minimum period of time.
3. The child is able to foresee the future and plan accordingly.
4. The child is able to take advantage of his previous experiences.
5. The child faces the future with compliance.
6. He develops a sense of discrimination between right or wrong.
7. The developmental period of intelligence is from birth to adolescence.
8. There is a minor difference in the development of intelligence between boys and girls.
9. There are individual differences with regard to the intelligence between boys and girls.
10. Intelligence is mostly determined by heredity but a suitable environment necessary to improve it.

CONCEPT OF IQ

IQ, short for *intelligence quotient*, is a measure of a person's reasoning ability. In short, it is supposed to gauge how well someone can use information and logic to answer questions or

make predictions. IQ tests begin to assess this by measuring short- and long-term memory. They also measure how well people can solve puzzles and recall information they've heard — and how quickly.

Every student can learn, no matter how intelligent. But some students struggle in school because of a weakness in one specific area of intelligence. These students often benefit from *special education* programs. There, they get extra help in the areas where they're struggling. IQ tests can help teachers figure out which students would benefit from such extra help.

IQ tests also can help identify students who would do well in fast-paced "gifted education" programs. Many colleges and universities also use exams similar to IQ tests to select students. And the U.S. government — including its military — uses IQ tests when choosing who to hire. These tests help predict which people would make good leaders, or be better at certain specific skills.

It's tempting to read a lot into someone's IQ score. Most non-experts think intelligence is the reason successful people do so well. Psychologists who study intelligence find this is only partly true. IQ tests can predict how well people will do in particular situations, such as thinking abstractly in science, engineering or art. Or leading teams of people. But there's more to the story. Extraordinary achievement depends on many things. And those extra categories include ambition, persistence, opportunity, the ability to think clearly — even luck.

Intelligence matters. But not as much as you might think.

THEORIES OF INTELLIGENCE

There are different theories about intelligence, none of which agreee with each other. Every approach to thinking comes up with it's own different perspective and assumptions, often contradicting at least one earlier theory.

Two factor theories of intelligence

Charles Spearman published an epoch-making study in 1904, which indeed proved to be the crucial step toward quantitative testing of theories, as opposed to simple quantification or measurement. He used the techniques of correlational analysis and factor analysis, both of which had been developed earlier by Karl Pearson, in relation to the scores obtained by groups of children on various intelligence tests. His historical significance can be seen in the development of the factor analytical method and in its explicit use for the first time. It is with regard to such importance that Guilford (1954, p. 472) has stated: "No single event in the history of mental testing has proved to be of such momentous importance as Spearman's proposal of his famous two-factor theory in 1904." Spearman was critical of Binet and Simon's (1905) practice of assembling a hodgepodge of problems for testing intelligence without first testing for the presence of a general factor or without weighing the problems in terms of their loadings on the general factor. He was concerned to test the theory that the obtained intercorrelations between various tests of intelligence were due entirely to a general intellective factor "g". In addition to that, he also recognised specific factors, "s" factors, which were specific to particular tests. Eysenck (1972, pp. 1-2) has contended that "essentially his point was that under these conditions matrices of intercorrelations between tests should be of rank one; he did not use matrix algebra himself, but his formulas are the equivalent of more modern versions." Spearman (1927) elaborated and revised his work in "The abilities of man." To understand his theory, let us assume that any correlation between two tests used by Spearman implies a factor common to both, plus two specific factors. Let the two tests be called a and b, the common factor "g", and the two specific factors sa and sb, as shown in the diagram drawn by Guilford (1953), which are reproduced below in Fig.

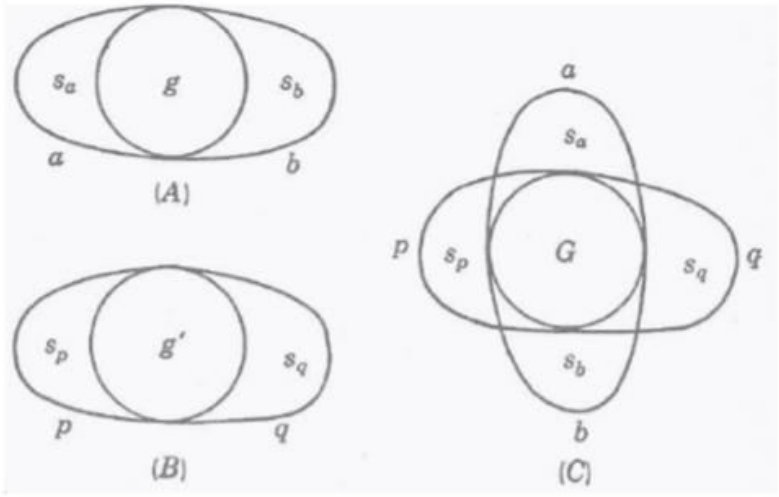

Fig.1.1: Graphical representation of Spearman's two factor theory
(*Source:* Guilford, 1953, p. 472)

In terms of the two-factor theory, we may regard that tests a and b are two measures of the common element "g", with the two remainders sa and sb. Similarly, let p and q be two other tests with "g" as the common element as shown in the Figure above. For some experiments, Spearman (1904) reported the correlations between "g" and "g" to approximate a value of 1.00. This meant that "g" and "g" were practically identical. Spearman believed that all intellectual activity contained some element or factor in common. This "g",or general factor, was postulated to be important in every mental act, although some acts were thought to depend upon it more than others. The difference between people in intelligence was a matter of how much "g"they possessed. Spearman called this general factor as "mental energy." Spearmen's analysis of intelligence was actually an interpretation of certain observations by using the method of tetrad difference. The correlation matrix, which he used for finding the criterion of proportionality and for calculating the tetrad difference, is given below: Table Showing Intercorrelations of Subtests Reported by Spearman (1927) Subtests 1 2 3 4 5 6 7 Analogies ... .50 .49 .55 .49 .45 .45 Completion .50 ... .54 .47 .50 .38 .34 Understanding paragraphs .49 .54 ... .49 .39 .44 .35 Opposites .55 .47 .49 ... .41 .32 .35 Instructions .49 .28 .39 .41 ... .32 .40 Resemblances .45 .38 .44 .32 .32 ... .35 Inferences .48 .34 .35 .35 .40 .35 ... Source: Spearman (1927) The abilities of man. New York: Macmillan, (p.149) Guilford (1953, pp. 473-474)

has shown that for any correlation matrix the criterion of proportionality can be easily calculated, following which the tetrad difference between various subtests can also be found. Let us understand what is tetrad difference? In recent years the quantity F, called the 'tetrad-difference', has become very important in psychological investigations as to the possible nature of the underlying causes of mental activities. If there are four such activities, and r13, r24, etc., the six correlation coefficients, (F is defined by the equation F = r13r24 - r14r23. The value of F, in practice, approximates to zero.) The tetrad difference thus in all cases comes to zero. The variation in measured intelligence that was not explainable in terms of this general factor or "g" was attributed by Spearman to specific factors or "s". There were many different specific factors. All intellectual tasks require some amount of "g." according to Spearman, the more highly the two functions were correlated, the more highly saturated they were with "g." Tests that are thought to have high "g" loadings involve abstract reasoning, comprehension, and problem solving. Graphic illustration of "g" and "s" can be made following Guilford (1953, pp. 474-475), which is reproduced below Fig. . In this Figure "Spearman's "g" factor is shown as the large central circle and the specifics as small circles grouped

Guildford's structure of intelligence (SI) model

J. P. Guilford was a psychologist involved during the World War II in developing tests to select candidates for training as pilots. As he expanded his interests into testing various other specific thinking skills, he developed a model to guide his research and to organize his thinking about all the various skills he was testing.

Guilford is generally credited with getting the field of psychology to start looking at creativity. In his 1950 Presidential Address to the American Psychological Association (Guilford, 1987), he pointed out the very important nature of creativity as a research topic and the scarcity of published research related to creativity. He felt that people were assuming that creativity was a

natural result of intelligence as measured by IQ, and as a result had not begun to look at creativity. Guilford gave his perspective on the field and announced his intention to use a factor analytic technique to begin isolating the various factors of thinking, to separate out creativity and other skills from the factors measured by IQ.

His "Structure of Intellect" model organized these various abilities along three dimensions: content, product, and process. He sought to develop tests for each combination of the possibilities on these three dimensions, expecting that a person could be high on some of these abilities while being low on others. In The nature of human intelligence (1967) and Way beyond the IQ (1977), he lays out the results of his efforts and the modified model which evolved from his research.

By content he meant that different people seemed to pay more attention to and think more effectively about different kinds of information, such as:

- Visual information directly from the senses or from imaging.
- Auditory information directly from the senses or from images.
- Symbolic items such as words and symbols which generally convey some meaning.
- Semantic meanings often, but not always, associated with words.
- Behavioral information about the mental states and behavior of observed individuals. This type of content was added to the model based on abilities that emerged from his testing. Daniel Goleman (1995) has popularized this as “social intelligence”.

An artist might excel at processing visual information, but be poor at processing words, numbers and other symbolic content. A researcher who excels at processing symbolic content such as words and numbers and semantic meaning, might be very poor at processing behavioural data and thus relate poorly with people.

The products dimension relates to the kinds of information we process from the content types:

- Units refers to the ability to perceive units in a content area. This might be symbolic units such as words, visual units such as shapes, or behavioral units such as facial expressions.
- Classes refers to the ability to organize units into meaningful groups and to sort units into the right groups.
- Relations pertains to the ability to sense the relationships between pairs of units.
- Systems consist of the relationships among more than two units.
- Transformations is the ability to understand changes in information, such as rotation of visual figures, or jokes and puns in the semantic area.
- Implications refers to expectation. Given a certain set of information, one might expect certain other information to be true.

With the two dimensions of content and product we can sort out all the kinds of information people can think about. People can talk about the implications of a symbolic series, the relationship of two sounds, or behavioral transformations such as changes in emotions.

The operations dimension describes what the brain does with and to these types of information:

- Cognition has to do with the ability to perceive the various items. For example, the cognition of semantic units has to do with one's ability to recognize words, i.e. one's vocabulary. Cognition of Behavioral Transformations would be the ability to perceive changes in the expressions of an individual.
- Memory has to do with the ability to store and retrieve various kinds of information. People differ in their abilities to remember not only from other people, but also among various kinds of information. Some people who are poor at remembering faces (behavioral units)

may be excellent at remembering puns (semantic transformations).

- Divergent production has to do with the ability to access memory. It refers to the ability to find large numbers of things which fit certain simple criteria. For example, the ability to divergently produce visual units includes the ability to list a great many images which include a circle. Divergence in behavioral transformations would include the ability to revise stories about people. Divergence in Symbolic Implications would include the ability to list various equations which can be deduced from given equations.
- Convergent Production is the search of memory for the single answer to a question or situation. This area includes most areas of logic type problem solving. It differs from divergence in the constraint of one right answer. It seems likely that performance on convergent tasks is actually the result of divergent production and evaluation, but it is an often tested for skill, and the one most often associated with IQ..
- Evaluation is the ability to make judgments about the various kinds of information, judgments such as which items are identical in some way, which items are better, and what qualities are shared by various items.

These three factors combine to identify 150 different skill areas. It is important to remember that this model was developed as a guide for a research project to explore the relations among the various categories and the ability to fit the results of tests into this model. It does not explicitly show the relationship among the various cells in the matrix. In Guilford's language, it could be said that they simply concentrated on the cognition of a class of behavioral contents.

One implication of this matrix is that most IQ tests are severely limited in the areas of ability they assess, often assuming that those who test well on some of the areas can be expected to do well on all of them. Gardner (1983) has made the

same case in simpler terms in Frames of Mind: The Theory of Multiple Intelligences in which he describes seven types of intelligence: linguistic, musical, logical-mathematical, spatial, bodily kinaesthetic, intrapersonal, and interpersonal.

It is useful to consider how these different skills contribute to problem solving and to look at how these categories fit the activities within organizations. In one of the last articles he published Guilford (1983) suggested that although much of the work on increasing creativity had focused on the various divergent production skills there seems to be a strong argument in favor of focusing upon the various skills related to transformations, which would support the idea of focusing some attention upon shifts in insight, on AHA's. Interviews with people creative in various complex technical and artistic disciplines confirm that such skills are a vital part of their work and source of their creativity.

Gardner's multiple theory of intelligence.

In 1983 a researcher and professor at Harvard University named Howard Gardner proposed a new view of intelligence that has been widely embraced since its publication, now being incorporated in school curricula across the country. In his seminal book Frames of Mind (New York: Basic Books, 1983), Gardner put forward his "Theory of Multiple Intelligences," a theory that challenged the dominant definition of intelligence as limited to mathematical and linguistic abilities (verbal and computational intelligences). Gardner theorized that rather than just these two intelligences, a grouping of seven intelligences more accurately accounts for the diversity of ways in which people acquire and utilize knowledge.

SEVEN INTELLIGENCES

Using the definition of intelligence as "the capacity to solve problems or to fashion products that are valued in one or more cultural setting" (Gardner & Hatch, 1989), Gardner used biological as well as cultural research to develop a list of seven intelligences.

Gardner's seven intelligences are:

(1) Logical-Mathematical Intelligence -- the ability to detect patterns, reason deductively and think logically. Most often associated with scientific and mathematical thinking.

(2) Linguistic Intelligence – the ability to use language masterfully to express oneself rhetorically or poetically. Also allows one to use language as a means to remember information.

(3) Spatial Intelligence -- the ability to manipulate and create mental images in order to solve problems. Not limited to visual sight, Gardner noted that blind children can possess spatial intelligence.

(4) Musical Intelligence -- the ability to read, understand, and compose musical pitches, tones, and rhythms. (Auditory functions are required for a person to develop this intelligence in relation to pitch and tone, but it is not needed for the knowledge of rhythm.)

(5) Bodily-Kinesthetic Intelligence -- the ability to use one's mind to control one's bodily movements. This challenges the popular belief that mental and physical activity are unrelated.

(6) Interpersonal Intelligence – the ability to apprehend the feelings and intentions of others.

(7) Intrapersonal Intelligence -- the ability to understand one's own feelings and motivations.

Gardner hypothesizes that these seven intelligences usually operate together, and rarely operate independently. The intelligences, he says, are used simultaneously, usually complementing one other as we develop skills or solve problems.

For example, a dancer can excel only if s/he has:

(1) Strong Musical Intelligence to understand the rhythm and variations of the music,

(2) Interpersonal Intelligence to understand how he can inspire or emotionally move his audience through his movements,

(3) Bodily-Kinesthetic intelligence to provide physical agility and coordination to execute movements successfully.

USING MULTIPLE INTELLIGENCES IN THE CLASSROOM

Accepting Gardner's Theory of Multiple Intelligences has several implications for teachers in terms of classroom instruction. The theory

states that all seven intelligences are needed to productively function in society. Educators, therefore, should think of all intelligences as equally important. This is in great contrast to traditional education systems, which typically place a greater emphasis on the development and use of verbal and mathematical intelligences. Thus, the Theory of Multiple Intelligences implies that educators should recognize and teach to a broader range of talents and skills.

A second implication is that teachers should structure the presentation of material in a style that engages most or all of the intelligences. For example, when teaching about the revolutionary war, a teacher can show students battle maps, play revolutionary war songs, organize a role play of the signing of the Declaration of Independence, and have the students read a novel about life during that period. This kind of presentation not only excites students about learning, but it also allows a teacher to reinforce the same material in a variety of ways. By activating a wide assortment of intelligences, teaching in this manner can facilitate a deeper understanding of the subject material.

CONCLUSION

Schools have often sought to help students develop a sense of accomplishment and self-confidence. Gardner's Theory of Multiple Intelligences provides a theoretical foundation for recognizing the different abilities and talents of students. This theory acknowledges that while all students may not be verbally or mathematically gifted, children may have an expertise in other areas, such as music, spatial relations, or interpersonal knowledge. Approaching and assessing learning in this manner allows a wider range of students to successfully participate in classroom learning.

MEASUREMENT OF INTELLIGENCE

We are only familiar with that intelligence of an individual which is manifested by him on an intelligence test or tests. Psychologists have devised many such tests for the measurement of intelligence.

Classification of Intelligence Tests

1. As far as the administrative point of view is concerned the intelligence tests can be classified into two broad categories namely-

(a) Individual tests : In which only one individual is tested at a time.

(b) Group tests: In which a group of individuals is tested at a time.

2. Another way of classifying the intelligence tests is based on the form of the test Accordingly there are two types of tests:

(a) Verbal or Language tests : These tests make use of language. Here the instructions
are given in words (either in written or oral form or both). Individuals are required

to use language as well as paper and pencil for giving the responses. The test

content of these tests is loaded with verbal material.

(b) Non-Verbal and Non-Language tests : These tests involve such activities in which
the use of language is not necessary. The use of language is eliminated from test

content and response except in giving directions.

Individual Verbal Tests

The tests involving the use of language and administered to an individual at a time belong to this category. As an example of such tests we can refer to **Stanford-Binet Scale.** It is the revised form of the Binet-Simon test. Actually, French psychologist Alfred Binet is said to be the father of intelligence test construction movement. He, along with Theodore Simon, prepared a test in as early as 1905, comprising 30 items (arranged in order of increasing difficulty) graded from different levels. The test included items like:
At age 3 – Point out the nose, eyes and mouth

At age 7 – Tell what is missing in the unfinished picture.

In the 1931, the first American revision of this test was published by Terman at Stanford university and in 1937 another revision was carried on with the help of Maud A. Merril. This as well as 1960's revision is called Stanford-Binet Scale and widely used as an individual intelligence test

The tests in this scale are grouped in age levels, extending from age 2 to 22 years. The tasks to be performed by the subjects in these various tests range from simple manipulation to abstract reasoning.

Binet Tests have been adopted in India too. The first such attempt was made by Dr.C.H. Rice in 1922 when he published his "Hindustani Binet Performance Point Scale". This was an adaptation of the Binet test along with performance tests. The State Manovigyan Shala of Uttar Pradesh has made a Hindi version of Stanford Binet Test. This test is divided into several age-groups and named as 'Budhi Pariksha Anooshilan'.

The other common Verbal Individual Intelligence test (used in India) is Samanya Budhi Pariksha (Pt. 1 and 2). This test is an Indian adaptation of

the well-known test of William Stephenson. It has been prepared by State Bureau of Educational and Vocational Guidance, Gwalior (M.P).

Individual Performance Tests

As said earlier, the complete non-verbal or non-language tests of intelligence for testing an individual at a time come into this classification. In these the contents and responses are in the form of performance and language is not used at all. In these tests the items which require responses in terms of motor activities are included. Generally the activities, on which the performance of an individual is tested, are of the following types:

(i) Block building or cube construction. Here the subject is asked to make a structure or design by means of blocks or cubes supplied to him. The examples of the tests involving such type of activities are Merril Palmer Block Building, Koh's Block Design Test, Alexander's Pass-along Test etc.

(ii) To fit the block in the holes. Test material of such types provides numerous blocks and a board in which there are holes corresponding to these blocks. The subject has to fit the blocks in these corresponding holes (I the board). Examples are Seguin Form Board test and Goddard Form Board Test.

(iii) Tracing a maze. Test material consists of a series of mazes of increasing difficulty, each printed on a separate sheet. The subject is required to trace with pencil the path from entrance to exit. Porteus Maze Test is an example involving such type of activities.

(iv) Picture arrangement or picture completion. In picture arrangement test, the task is to arrange in series the given picture whereas in picture competition test, the subject is required to complete the pictures with the help of given pieces cut out of each picture. The Healy pictorial completion test is a good example of such test which provides a good estimate of the intelligence of the subject without making use of language.

As seen above, these tests try to emphasize upon one or the other types of performance. Instead of using one or two tests a group of performance test, organized either into a scale or battery, may be used for a comprehensive picture of an individual's mental ability. Some of the popular known scales are:

(i) The Pinter Patterson Scale.

(ii) The Arthur Point Scale.

(iii) Alexander's Battery of Performance Tests.

In India too, attempts for constructing such batteries have been made. Dr. Chander Mohan Bhatia's work in this regard deserves special mention. He has developed a battery of performance tests known as 'Bhatia's Battery of Performance Tests'. It contains the following five sub-tests:

1. Koh's Block Design Test.
2. Alexander's Pass-along Test.
3. Pattern Drawing Test.
4. Immediate memory test for digits (with an alternative form suitable for illiterates)
5. Immediate memory test for digits (with an alternative form suitable for illiterates).
6. Picture construction Test.

The last three tests in this battery have been constructed by Mr.Bhatia himself while former two have been borrowed.

WECHSLER INTELLIGENCE SCALE

This scale is available in two forms. While the WISC form is used for children, the WAIS form is for adults. It is an individual test that has a unique quality of being named as verbal and performance scale simultaneously.

The scale consists of eleven sub-tests six sub-tests make up a verbal scale and five performance scale. These tests are listed below in the order in which they are administered.

Verbal Scale :

1. Test of General information
2. Test of General comprehension
3. Test of Arithmetic reasoning
4. Test of distinction between similarities
5. Test of Digit span
6. Test of Vocabulary

Performance Scale :

7. Digit symbol tst
8. Picture completion test
9. Block Design test
10. Picture arrangement test
11. Object assembly test

The scores on these sub-tests are added to get an idea of an individual's intelligence.

Group Verbal Intelligence Tests

The tests, which necessitate the use of language and are applied to a group of individuals at a time, come under this category. Some of the earlier tests belonging to this category are :

1. Army Alpha Test (developed in World War)
2. Army General Classification Test (developed in second World War)

Today we have a large number of group verbal tests. In India too, attempts have been made to construct such tests. Some of the popular tests of this nature are-

1. C.I.E. Verbal Group Test of Intelligence (Hindi) constructed by Prof. Uday Shankar
2. The Group Test of General Mental Ability (Samuhik Mansik Yogyata Pariksha)

constructed by Dr. J.S. Jalota (Hindi)

3. Group test of Intelligence, prepared by Bureau of Psychology, Allahabad (Hindi)

4.Prayag Mehta's Group Intelligence Test (samuhik Budhi Pariksha, Hindi). This test has been published by Mansayan, Delhi.

5. General Mental Abilities Test prepared by Dr.P.S. Hundal of Punjab University Panjabi)
1. Group verbal intelligence test prepared by Dr.P. Gopala Pillai of the KeralaUniversity (Malayalam)
2. Samuhic Budhi Pariksha (Hindi), prepared by Shri P.L. Shrimali, Vidya BhavanG.S. Teacher College, Udaipur.
8. Samuhic Budhi Ki Jaanch (Hindi), prepared by Shri M.S. Mohsin, Educational and Vocational Guidance Bureau, Patna, Bihar.

The Group Non-Verbal Intelligence Tests

These tests do not necessitate the use of language and are applicable to a group of individual at a given time.

The difference between performance test (used for an individual) and non-verbal tests (used for a group) is in the degree as far as their non-verbal nature is concerned. The performance tests require the manipulation of concrete objects or materials supplied in the test by the subject. Responses are purely motor in character and seldom require the use of paper and pencil by the testee, (except in cases like Maze Test etc.) where as the test material used for group testing, is provided in booklet and requires the use of pencil by the testee.

Still in these tests, material does not contain words or numerical figures. It contains pictures, diagrams and geometrical figures etc. printed in a booklet. The subject is required to do such activities so as to fill in some empty spaces, draw some simple figures to point out similarities and

dissimilarities etc. So, although the subject uses paper and pencil, he does not need to know words or numerical figures. What he has to do is explained clearly by the examiner usually through clear demonstrations so as to make the least possible use of language. The examples of such type of tests are:

1. ***Army Beta Test.*** It was developed during World War I, in U.S.A. for testing the intelligence

of those soldiers who were either illiterate or were not used to English language.

2. ***Chicago Non-verbal Test***. This non-verbal test has proved most useful for young children aged between 12 and 13 years.
3. ***Raven's Progressive materials Test***. This test was developed in the U.K. It is a very

popular non-verbal group test of intelligence. The test has been designed to evaluate the subjects ability-

(a) to see relationship between geometric figures or designs.

(b) to perceive the structure of the design in order to select appropriate part for the Competition of each patern.

C.I.E. Non-Verbal Group Test of Intelligence. Originally prepared by J.W. Jenkins, the test

Is printed by C.I.E. for adaptation into Hindi medium Schools. The test contains such terms As instructed in the following figure.

Verbal Tests Vs Non-Verbal and Performance Tests :

What led to the construction of non-verbal and performance test when verbal tests were there for testing the intelligence, is a relevant question to be asked. Verbal tests, as already said, laid emphasis on linguistic ability. They were loaded with verbal material words and numerical. Hence those with linguistic superiority were always on the advantageous side in comparison to those having language weakness. To do away with such flaws, non-verbal and performance tests were put to use. In brief, the advantage of these tests over verbal tests are as under.

1. Performance tests are useful for those who have language handicap due to one or more of the following reasons.

(a) They may belong to the foreign language speaking group.

(b) They may be illiterates, not knowing how to read and write.

(c) They may have difficulties in reading, writing and listening due to defects in their sense organs (deaf , dumb etc.)

(d) They may be younger children who are not yet able to read and write well.

(e) They may be mentally retarded or mentally deficient children and therefore, very slow in grasping and responding to the verbal items.

(f) They may belong to unprivileged class or strata of the society and hence may have had limited education opportunities.

2. Verbal test belonging to one region contains the material which has a direct relationship with the language or culture of that region or country. Non-verbal and performance tests are more or less language and culture-free and hence can be used for cross-cultural and linguistic study of intelligence.
3. They can prove useful in the efforts to determine aptitude and promise in shop work mechanical jobs and so on.

How Good can Intelligence be Measured?

Measurement of intelligence is not possible in the same way as we measure a piece of cloth or the temperature of our body. Why is it not possible can be understood through the following discussion:

1. Nature of the thing we want to measure : Intelligence is not a thing. It is only an idea, an abstraction. Therefore, its measurement is not possible like the measurement of a piece of cloth, wood or land etc.
2. Nature of the instrument or the scale by which intelligence is measured: In measuring a piece of cloth we use scales made up of absolute units. For measuring temperature of the body we use thermometers having degrees as units of measurement. In such measurement, we use scales made up of absolute units and the instruments give somewhat reliable and valid results. But in case of intelligence measurement we don't have such scales. Here, as Griffith observes "the standard of measurement is the group of performance.

CONCEPT OF MENTAL AGE (M.A.) AND INTELLIGENCE QUOTIENT (I.Q.)

As we have already used the term 'mental age' and I,Q. in the interpretation of intelligence test results, it is worth knowing something about them as well.

Mental age. The term mental age was first used by Binet. Its concept can be clarified with the help of the following example.

Suppose there is a test comprising 100 questions (like Jalota's test) and the majority of the subjects, whose age is 13 years 6 months, answer successfully 48 questions, then an individual who earns a score, 48,

regardless of his chronological age, will be said to have a mental age of 13 years 6 months.

Intelligence Quotient (I.Q.) This term was initiated by the German psychologist William Stern and put into wide practice by Terman. It appeared to Stern that if a child was 6 years old (chronologically), but could do what an 8 years old normally does he would be 8/6 or 1.33 as bright as the average. And in this way, he made the ratio M.A./C.A., measure of the rate of mental development of an individual. The ratio was given the name of Intelligence Quotient (I.Q.) To do away with the decimal point, the ratio was a gain multiplied by 100 and thus the formula to calculate I.Q. is:

$$\text{I.Q.} = \frac{\text{Mental Age (M.A.)}}{\text{Chronological Age (C.A.)}} \times 100 \text{ (as used in Standard Binet Scale)}$$

Or,

$$\text{I.Q.} = \frac{\text{Attained or actual score}}{\text{Expected mean score for Age}} \times 100 \text{ (as used by Wesschsler)}$$

Classification of I.Q.

By making use of the formula of I.Q. by sterm. Terman tried to classify the individuals into certain specific categories on the basis of the data collected through the administration of
his intelligence tests for terming them average, below average and above average as given below:

I.Q.	Level of Intelligence
140 and above	Gifted or Genius
120-140	Very Superior
110-120	Superior

90-110	Normal or Average
75-90	Border Line and Dull
50-75	Morons
25-50	Imbeciles
Below 25	Idiots

However, as far as the classification based on the intelligence tests suitable to the Indian conditions is concerned, the following one presented by Professor Uday Shankar may work well

I.Q.	Level of Intelligence
140 and above	Genius
120-140	Very Superior
110-125	Superior
90-110	Average
75-90	Border Line and Dull
50-75	Morons or Feeble minded
25-50	Imbeciles
Below 25	Idiots

INDIVIDUAL DIFFERENCES IN DISTRIBUTION OF INTELLIGENCE

The bell shaped normal curve explains that intelligence is normally distributed.
The mean IQ is 100 Sixty percent of the cases lie between 90 and 110, called the persons of average intelligence.

The Constancy of I.Q.
As mentioned earlier, intelligence grows till the age of 16 or 18 years, but I.Q. for most of the individuals remains constant. Primarily I.Q. provides a ratio for knowing how bright an individual is as compared with others of his own age.

Actually, it is an index which is independent not only of the particular score that an individual makes on a particular scale but also of the particular age at which he happens to make it. It is thus a measure which acquaints us with the relative brightness or intellectual possibilities of an individual more or less permanently see the following figure.

Uses and Limitations of Intelligence Tests :
Intelligence tests have their advantage as well as drawbacks. Below we list them one by one.

USES OF INTELLIGENCE TESTS

1. ***For the purpose of selection.*** Intelligence tests are often used for the purpose of making selection of the suitable candidates for activities like-
2. a) admission in a particular course of instruction
3. b) deciding the cases of scholarships.
4. c) choosing candidates for assigning some specific responsibilities.
5. d) selecting candidates for participation in various co-curricular activities etc.

2.For the purpose of classification. Intelligence tests help the teacher classify the students as bright, dull or average and put them in homogeneous groups in order to bring efficiency in the teaching-learning process.

3. ***For the purpose of Promotion***. Intelligence tests can prove as one of the useful instruments in promoting the individuals not only in educational fields but in all other occupational and social situations where one studies to go higher on the ladder.
4. ***For knowing one's potentiality***. Intelligence tests help in revealing the potentialities of an individual and thus make possible the predication of one's success in a particular field. The knowledge of such potentiality helps the teacher in the following ways :
5. Giving guidance
6. Helps in learning process

7. To establish a proper level of aspiration
8. ***For diagnostic purpose.*** Exceptional children like gifted, backward and the mentally retarded children can be detected with the help of intelligence tests. Moreover, the intelligence tests help in the diagnosis of the root causes of problematic behaviour of the child and likewise suggest possible remedies.
9. ***Helps in Research work.*** Intelligence testing has proved very useful in psychological environment in the process of growth and development, research workers have made much use of intelligence testing.

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.

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.

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 pains 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 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

STAGES OF 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 particulartask 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.

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 andinhibitions; 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.

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.

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 whelming 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.

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.

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 tittles 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

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 tittles 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 arerequested 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.

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.)

SOME MORE ACTIVITIES

Following activities have been takenfrom various sourcesand 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

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) 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.

1. LONG QUESTIONS

a. What is individual different discus is nature?
b. Give and enlarge note on factors of individual different?
c. What is intelligence? Discuss its nature.
d. Critically analyses two factor theory of intelligence?
e. Discuss Guildford's structure of intelligence model.
f. Discuss multihull theory of intelligence.
g. Write a note on measurement of intelligence.
h. What is creativity? Discuss its stages.

2. SHORT QUESTION

a. What is individual different?
b. What is intelligence?
c. What is the full form of I.Q?
d. What is the full form of M.A?
e. Define M.A.
f. Who gave two factor theory of intelligence?
g. What is "G" factor?
h. What is "S" factor?
i. Who gave structure of intelligence?
j. Who is the founder of multihull theory of intelligence?
k. What is verbal test?
l. What is non- verbal test?
m. What is individual test?
n. What is group test?
o. What is creativity?

YOUTUBE LINK

FOR MORE INFORMATION YOU HAVE TO GO MY CHANNEL EXTRA HAND OR GO THE FOLLOWING LINK-

RESEARCH

1. https://www.youtube.com/watch?v=0zITfpH89_E
2. https://www.youtube.com/watch?v=XsLu3E3kwp0
3. https://www.youtube.com/watch?v=InH2hrOW9rA
4. https://www.youtube.com/watch?v=MIPBbr_i3Yk
5. https://www.youtube.com/watch?v=72AJeV-faCE
6. https://www.youtube.com/watch?v=Nn89gfUC1bI
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