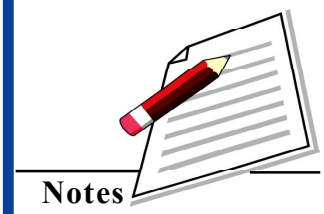
18

INTELLIGENCE



One of the widely studied psychological attributes is Intelligence. People differ from one another in their ability to understand complex ideas, adapt to the environment, learn from experience, engage in various forms of reasoning, and overcome obstacles.

LEARNING OUTCOMES

After studying this lesson, learner :

- describes the meaning of intelligence;
- discusses theories of Intelligence;
- explains the meaning of emotional intelligence;
- examines the relationship between creativity and intelligence; and
- understands the concept of emotional intelligence.

18.1 CONCEPT OF INTELLIGENCE

Intelligence is a key construct employed to know how individuals differ from one another. Intelligence is the global capacity to think rationally, understand the world, and use available resources effectively when faced with challenges. Intelligence tests provide a global measure of an individual's general cognitive competence.

Different authors have defined intelligence in several ways. Alfred Binet was one of the first psychologists who conceptualized 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 the environment. He defined it as 'the global and aggregate capacity of an individual to think rationally, act purposefully, and deal effectively with her/his environment.' Others like Gardner and Sternberg have understood intelligence in terms of an individual not only adapting to the environment but also actively modifying or shaping it. Therefore, there is no one definition of intelligence. It is a very dynamic and ever-evolving concept.

One of the widely used measures of intelligence in an individual is 'IQ' or intelligence quotient. IQ as a concept was derived by William Sterns in 1912, wherein he formulated that an IQ is an individual's mental age (MA) divided by his/her Chronological age (CA) and multiplied by 100. IQ is represented by the following formula:

Intelligent Quotient (IQ)=MA/CA x 100

The purpose of multiplication is the avoidance of decimal points. When MA is equal to CA, the IQ is said to be 100 which is the average score of intelligence. When MA is greater than CA, the IQ is above 100 and the individual is said to be more intelligent than his/her peers. When MA is less than CA, IQ is below 100 and then the individual is considered below average as compared to others of his/her age.

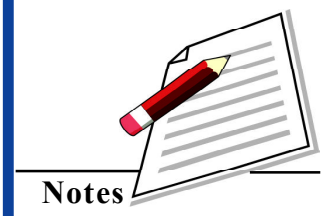
18.1.1. Extremes Of Intelligence

IQ scores are distributed in the population in such a way that the scores of most people tend to fall in the middle range of the distribution. Only a few people have either very high or very low scores. The frequency distribution for the IQ scores tends to approximate a bell-shaped curve, called the normal curve. This type of distribution is symmetrical around the central value, called the mean.

The mean IQ score in a population is 100. People with IQ scores in the range of 90-110 have normal intelligence. Those with IQ below 70 are suspected to have 'intellectual deficiency', while persons with IQ above 130 are considered to have exceptional talents.

Intellectual Deficiency

There are children who face enormous difficulty in learning even very simple skills. Those children who show intellectual deficiency are termed as 'intellectually disabled'. As a group, there is wide variation among the intellectually disabled. The American Association on Mental Deficiency (AAMD) views intellectual disability as "significantly



sub-average general intellectual functioning existing concurrently with deficits in adaptive behaviour and manifested during the developmental period". This definition points to three basic features. First, in order to be judged as intellectually disabled, a person must show significantly sub-average intellectual functioning. Persons having IQs below 70 are judged to have sub-average intelligence. The second relates to deficits in adaptive behaviour. Adaptive behaviour refers to a person's capacity to be independent and deal effectively with one's environment. The third feature is that the deficits must be observed during the developmental period that is between 0 and 18 years of age.

Individuals who are categorised as having intellectual disabilities show significant variation in their abilities, ranging from those who can be taught to work and function with special attention to those who cannot be trained and require special attention throughout their lives. The different levels of intellectual disability are: mild (IQs 55 to approximately 70), moderate (IQs 35-40 to approximately 50- 55), severe (IQs 20-25 to approximately 35-40), and profound (IQs below 20-25). Although the development of people with mild disabilities is typically slower than that of their peers, they can function quite independently, and hold jobs and families. As the level of disability increases, the difficulties are strongly marked. People with moderate disabilities, lag behind their peers in language and motor skills. They can be trained in self-care skills, and simple social and communication skills. They need to have a moderate degree of supervision in everyday tasks. Individuals with profound and severe disabilities are incapable of managing life and need constant care for their entire lives. AAMD classification of mental retardation is presented in the table below.

Table 1: AAMD classification of mental retardation.

Level	**Intelligence Quotient**	**Adaptation to Demands of life**
Mild	50-70	Educable, can function independently, and hold jobs and family.
Moderate	35-49	Trainable for self-care but not educable.
Severe	20-34	Incapable of managing life and need constant care for their entire lives May perform simple tasks under the supervision
Profound	Below 20	Require constant aid and supervision. Incapable of managing life and need constant care for their entire lives

Intellectual Giftedness

Intellectually gifted individuals show higher performance because of their outstanding potential. The study of gifted individuals began in 1925 when Lewis Terman followed the lives of about 1500 children with IQs of 130 and above to examine how intelligence was related to occupational success and life adjustment. Although the terms 'talent' and 'giftedness' are often used interchangeably, they mean different things. Giftedness is exceptional general ability shown in superior performance in a wide variety of areas. Talent is a narrower term and refers to the remarkable ability in a specific field (e.g., spiritual, social, aesthetic, etc.). The highly talented are sometimes called 'prodigies'. It has been suggested by psychologists that giftedness from the teachers' point of view depends on a combination of high ability, high creativity, and high commitment. Gifted children show early signs of intellectual superiority. Even during infancy and early childhood, they show a larger attention span, good recognition memory, preference for novelty, sensitivity to environmental changes, and early appearance of language skills. To equate giftedness with brilliant academic performance is not correct. Athletes who show superior psychomotor ability are also gifted. Each gifted student possesses different strengths, personalities and characteristics. Performance on intelligence tests is not the only measure for identifying the gifted. Many other sources of information, such as teachers' judgment, school achievement records, parents' interviews, peer and self-ratings, etc. can be used in combination with intellectual assessment. To reach their full potential, gifted children require different educational and life enrichment programmes beyond those provided to normal children in regular classrooms.

INTEXT QUESTIONS 18.1

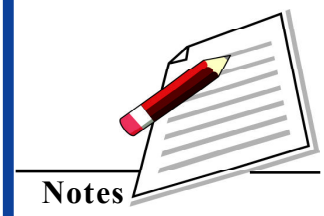
Note: Give your answer in the space given below and compare it with answers given at the end of this unit.

1. Intelligence is the ability to evaluate, judge and adapt to the environment to function effectively. (True/False)

2. Intelligence is the product of both nature and nurture. (True/ False)

3. There are four subcategories of mental retardation; they are mild, moderate, _____ and _____.

4. The highly talented people are sometimes called _____.



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18.1.2 THEORIES OF INTELLIGENCE

We now move further to describing various widely accepted theories. The sequence of these theories also indicates the history of intelligence theories.

Uni-factor theory: Alfred Binet was the first psychologist who formalized the concept of intelligence in terms of mental operations. Binet's theory of intelligence is conceptualized as consisting of one similar set of abilities which can be used for solving any or every problem in an individual's environment.

Two-factor theory: Charles Spearman (1927) proposed a two-factor theory of intelligence. He suggested that intelligence consisted of a general factor (g-factor) and some specific factors (s-factors). The g-factor includes mental operations which are primary and common to all performances' factors include all specific aspects of intelligence that help you in excelling in your field of interest. For example, Lata Mangeshkar in singing or Sachin Tendulkar in cricket.

Theory of primary mental abilities: Louis Thurstone proposed the theory of primary mental abilities. It states that intelligence consists of seven primary abilities, each of which is relatively independent of the others. These primary abilities include: (i) Verbal Comprehension (grasping the meaning of words, concepts, and ideas), (ii) Numerical Abilities (speed and accuracy in numerical and computational skills), (iii) Spatial Relations (visualising patterns and forms), (iv) Perceptual Speed (speed in perceiving details), (v) Word Fluency (using words fluently and flexibly), (vi) Memory (accuracy in recalling information), and (vii) Inductive Reasoning (deriving general rules from presented facts).

Theory of multiple intelligence: Howard Gardner (1983) proposed the theory of multiple intelligence, wherein intelligence is not considered a single entity; rather believes in the existence of distinct types of intelligence. Each of this intelligence is independent of the other. This means that, if a person exhibits one type of intelligence, it does not necessarily indicate being high or low on other types of intelligence. Also, that different types of intelligence interact and work together to solve a problem. Gardner described eight types of intelligence; they are as followed:

- **Linguistic (skills involved in the production and use of language):** It is the capacity to use the language fluently and flexibly, to express one's thinking and also understand other people. Persons high on this intelligence are 'word-smart', i.e., they are sensitive to different word meanings, can articulate, and can create

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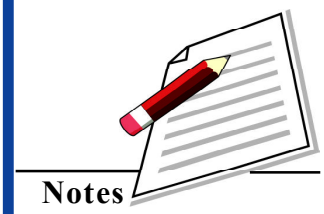
linguistic images in their minds. Poets and writers are very strong in this component of intelligence.

- **Logical-Mathematical (skills in scientific thinking and problem-solving):** Persons high on this type of intelligence can think logically and critically. They engage in abstract reasoning and can manipulate symbols to solve mathematical problems.
- **Spatial (skills in forming visual images and patterns):** It refers to the abilities involved in forming, using, and transforming mental images. A person high on this intelligence can easily represent the spatial world in the mind. Pilots, sailors, sculptors, painters, architects, interior decorators, and surgeons are likely to have highly developed spatial intelligence.
- **Musical (sensitivity to musical rhythms and patterns):** It is the capacity to produce, create and manipulate musical patterns.
- **Bodily-Kin aesthetic (use whole or portions of the body flexibly and creatively):** This consists of the use of the whole body or portions of it for the display or construction of products and problem-solving. People high on this type of intelligence are most likely to become athletes, dancers, actors, sportspersons, gymnasts, and surgeons.
- **Interpersonal (sensitivity to subtle aspects of others' behaviours):** It involves the skill of understanding the motives, feelings and behaviours of other people to form and bond into a comfortable relationship with others. Professionals high in interpersonal intelligence may include Psychologists, counsellors, politicians, social workers, and religious leaders.
- **Intrapersonal (awareness of one's own feelings, motives, and desires):** This refers to the knowledge of one's internal strengths and limitations and using that knowledge to effectively relate to others. Persons high on this ability have finer sensibilities regarding the purpose of their life and existence. Philosophers and spiritual leaders seem to be high on this type of intelligence.
- **Naturalistic (sensitivity to the features of the natural world):** This involves complete awareness of our relationship with the natural world. Hunters, farmers, tourists, zoologists, bird watchers and others seem to be high on naturalistic intelligence.



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- **Triarchic theory of intelligence:** Robert Sternberg (1985) proposed the triarchic theory of intelligence, wherein intelligence is viewed as "the ability to adapt, to shape and select the environment to accomplish one's goals and those of one's society and culture". This theory conceptualizes intelligence into three basic types: Componential, Experiential, and Contextual.
- **Componential Intelligence:** Componential also known as analytical intelligence, which is the analysis of information to solve problems. This intelligence has three components, each serving a different function. First is the knowledge acquisition component, which is responsible for learning and acquisition of ways of doing things. The second is the meta or a higher order component, which involves planning concerning what to do and how to do it. The third is the performance component, which involves actually acting upon a planned course of action.
- **Experiential Intelligence:** Experiential also known as creative intelligence, is involved in using past experiences creatively to solve novel or new problems. People high on this aspect integrate different experiences in an original way to make new discoveries and inventions.
- **Contextual Intelligence:** Also called practical intelligence, involves the ability to deal with environmental demands encountered on a daily basis. It may be called 'street smartness' or 'business sense'.

INTEXT QUESTIONS 18.2

Give your answer in the space given below and compare it with the answers at the end of this unit.

1. Triarchic theory of intelligence includes three components: componential, _____, and contextual intelligence.
2. Which one is not the part of Gardner's theory of multiple intelligence:

   a) Interpersonal

   b) Structural

   c) Naturalistic

   d) Intrapersonal

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3. Theory of intelligence given by Spearman is called:

a) Uni-factor theory

b) multi-factor

c) Primary mental abilities

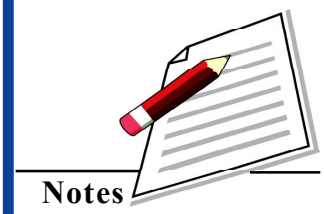
d) Two-factor

18.1.3. Assessment Of Intelligence

The timeline of the history of the assessment of intelligence indicates the contribution of several experts in the field toward the development of psychological testing regarding intelligence.

In 1905, Alfred Binet and Theodore Simon made the first successful attempt to formally measure intelligence. Later, in 1908, when the scale was revised, they gave the concept of Mental Age (MA), which is a measure of a person's intellectual development relative to people of her/his age group. A mental age of 10 means that a child's performance on an intelligence test will be equal to the average performance level of a group of 10-year-olds. Chronological Age (CA) is the biological age from birth. A bright child's MA is more than her/his CA; for a dull child, MA is below the CA. In 1912, William Stern, a German psychologist, devised the concept of the Intelligence Quotient (IQ). IQ refers to mental age divided by chronological age and multiplied by 100. The number 100 is used as a multiplier to avoid the decimal point. When the MA equals the CA, the IQ equals 100. If MA is more than the CA, IQ is more than 100. IQ becomes less than 100 when the MA is less than the CA. For example, a child with an MA of 5 would have an IQ of 50 (5/10 ´ 100). The average IQ in the population is 100, irrespective of age.

Wechsler further defined intelligence as the capacity of an individual to act purposefully, to think rationally, and to deal effectively with his or her surroundings or situation. David Wechsler published the first intelligence test explicitly designed for an adult population, known as the Wechsler Adult Intelligence Scale, or WAIS. After the WAIS was published, Wechsler extended his scale for younger people, creating the Wechsler Intelligence Scale for Children, or WISC.



18.1.4 Tests of intelligence

Wide variety of intelligence tests have been devised, which can be categorised on the basis of the following criteria:

- **Individual or Group Tests:** An individual intelligence test is one which can be administered to one person at a time. A group intelligence test can be administered to several persons simultaneously. Individual tests require the test administrator to establish a rapport with the subject and be sensitive to her/his feelings, moods and expressions during the testing session. Group tests, however, do not allow an opportunity to be familiar with the subjects' feelings. Individual tests allow people to answer orally or in a written form or manipulate objects as per the tester's instructions. Group tests generally seek written answers usually in a multiple-choice format. Bhatia's Battery is an example of an Individual test whereas Raven's progressive matrices is a group test

- **Verbal, Non-Verbal, or Performance Tests:** Verbal tests require subjects to give verbal responses either orally or in a written form. Therefore, verbal tests can be administered only to literate people. The non-verbal tests use pictures or illustrations as test items. Performance tests require subjects to manipulate objects and other materials to perform a task. Written language is not necessary for answering the items. For example, Koh's' Block Design Test contains a number of wooden blocks. The subject is asked to arrange the blocks within a time period to produce a given design. A major advantage of performance tests is that they can be easily administered to persons from different cultures. For example, the Joshi's Intelligence test is a verbal test of intelligence catering to the Indian population.

- **Culture-Fair or Culture-Biased Tests:** Many intelligence tests show a bias to the culture in which they are developed. Tests developed in America and Europe represent an urban and middle-class cultural ethos. Hence, educated middle-class white subjects generally perform well on those tests. The items do not respect the cultural perspectives of Asia and Africa. The norms for these tests are also drawn from western cultural groups. Psychologists have tried to develop tests that are culture-fair or culturally appropriate, i.e., one that does not discriminate against individuals belonging to different cultures. In such tests, items are constructed in a manner that they assess experiences common to all cultures or have questions in which language usage is not required. Non-verbal and performance tests help reduce the cultural bias usually associated with verbal

tests. For example, the Bhatia battery test of intelligence is a performance test to measure the intelligence of the Indian population.

INTEXT QUESTIONS 18.3

Note: Write your answer in the space given below and compare it with the answers at the end of this unit.

1. Binet and _____ were the first to initiate the formal measurement of intelligence.

2. The concept of Intelligence quotient (IQ) was given by _____.

3. Shabnam is 12 years old and her mental age is 15 years. What would be her IQ based on the provided information?

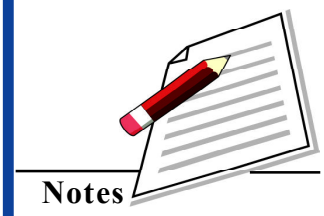
   a) 120 b) 80 c) 125 d) 100

4. Koh's' Block Design Test is an example of _____ type of test.-

18.2 EMOTIONAL INTELLIGENCE

The notion of emotional intelligence broadens the concept of intelligence beyond the intellectual sphere/domain and considers that intelligence includes emotions. Emotional intelligence is a set of skills that underlie accurate appraisal, expression, and regulation of emotions. It is the feeling side of intelligence. A good IQ and scholastic record are not enough to be successful in life. You may find many people who are academically talented but are unsuccessful in their own life. They experience problems in the family, workplace, and interpersonal relationships. What do they lack? Some psychologists believe that the source of their difficulty may be a lack of emotional intelligence. This concept was first introduced by Salovey and Mayer and popularised by Daniel Goleman. Salovey and Mayer defined emotional intelligence as "the ability to monitor one's own and other's emotions, to discriminate among them, and to use the information to guide one's thinking and actions". This definition covers four aspects of emotional intelligence they are emotional perception, emotional integration, emotional understanding, and emotional management. Whereas Goleman defined EQ as a cluster of traits relating to the emotional side of life. Goleman proposed 5 aspects of Emotional Intelligence. They are:

1. Knowing one's own emotions



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2. Managing one's own emotions
3. Motivating oneself
4. Recognizing the emotions of others
5. Handling emotions

Emotional Quotient (EQ) is used to express emotional intelligence in the same way as IQ is used to express intelligence.

18.3. CREATIVITY AND INTELLIGENCE

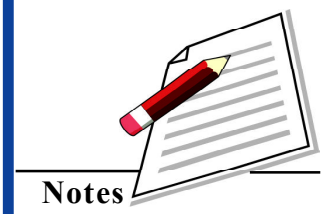
In recent years, our understanding of creativity has broadened. Creativity is not just limited to a selected few - the artist, the scientist, the poet or the inventor. An ordinary individual who is engaged in simple occupations like pottery, carpentry, cooking, etc. can also be creative. However, it has been said that they are not working at the same level of creativity as an eminent scientist or a writer. Hence, we can say that individuals vary in terms of the level and the areas in which they exhibit creativity and that all may not be operating at the same level. For example, the concept of a vertical garden is not only a beautiful site but is also an effective way of reducing the carbon footprints of the buildings by filtering pollutants out of the air, which results in a better quality of air. Another level of creativity is working on what has already been established earlier by way of modifications, by putting things in new perspectives or to new use.

One important debate in understanding the variations in creativity has been the relationship of creativity with intelligence. Terman found that persons with high IQs were not necessarily creative. Researchers have also found that both high and low levels of creativity can be found in highly intelligent children and also children of average intelligence. The same person, thus, can be creative as well as intelligent but it is not necessary that intelligent ones, in the conventional sense, must be creative. Intelligence, therefore, by itself does not ensure creativity. Researchers have found that the relationship between creativity and intelligence is positive. All creative acts require some minimum ability to acquire knowledge and the capacity to comprehend, retain, and retrieve. Creative writers, for example, need a facility in dealing with language. The artist must understand the effect that will be produced by a particular technique of painting, a scientist must be able to reason and so on. Hence, a certain level of intelligence is required for creativity but beyond that intelligence does not correlate well with creativity.

A general feature of most of the creativity tests is that they are open-ended. They permit the person to think of different answers to the questions or problems in terms of her/his experiences, whatever these may have been. There are no specified answers to questions or problems in creativity tests. Creativity tests involve divergent thinking and assess such abilities as the ability to produce a variety of ideas, i.e., ideas which are off-the-beaten-track, the ability to guess causes and consequences, the ability to put things in a new context, etc. This is contrary to the tests of intelligence which mostly involve convergent thinking. In tests of intelligence, the person has to think of the right solution to the problem and the focus is on assessing abilities such as memory, logical reasoning, accuracy, perceptual ability, and clear thinking. There is little scope for the expression of spontaneity, originality, and imagination. Since expressions of creativity are varied, tests have been developed using different stimuli like words, figures, action, and sounds. These tests measure general creative thinking abilities like ability to think of a variety of ideas on a given topic/ situation, alternative ways of looking at things, problems or situations, to guess causes and consequences, to think of unusual ideas to improve and to use common objects, ask unusual questions and so on.

ACTIVITY

1. Prepare a list of characteristics of an Intelligent person.
2. To identify creativity, prepare a list of items of daily use like paper, pencils, water bottles etc., and ask your friends to tell the uses of these items as much as they can.



WHAT YOU HAVE LEARNT

- Intelligence
  - Intellectual Deficiency
  - Intellectual Giftedness
  - Theories of Intelligence
    - Uni-factor Theory
    - Two – factor Theory
    - Theory of Primary mental abilities
    - Theory of Multiple Intelligence
      - Theory of Multiple Intelligence
        - Types of Intelligence
          - Linguistic
          - Logical Mathematical
          - Spatial
          - Musical
          - Bodily Kinesthetic
          - Interpersonal
          - Intrapersonal Naturalistic
  - Assessment of Intelligence
    - Individual or Group Tests
    - Verbal, Non-Verbal or Performance Tests
    - Culture-fair or Cultural-Biased tests
  - Emotional Intelligence
    - Knowing one's own emotions
    - Managing one's own emotions
    - Motivating oneself
    - Recognizing the emotions of others
    - Handling emotions

TERMINAL QUESTIONS

1. What is Intelligence? Discuss different theories of Intelligence.
2. What do you mean by assessment of intelligence? Describe different types of intelligence tests.
3. Define Creativity. Discuss the relationship between creativity and intelligence.
4. What is emotional intelligence? Explain its importance in a person's life.
5. What is the formulae for calculating IQ and what does it represent?
6. What are the different levels of intellectual disability and how do they vary in terms of abilities and needs for support and care?
7. How is intellectual giftedness measured and what educational programs are needed for gifted children to reach their full potential?
8. What is the theory of multiple intelligence proposed by Howard Gardner and how does it differ from other theories of intelligence?
9. What are the different types of intelligence explained by Howard Gardner? Explain any four briefly.
10. What are the three basic types of intelligence according to Robert Sternberg's Triarchic theory of intelligence?

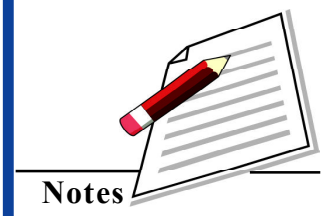
ANSWERS TO INTEXT QUESTIONS

18.1

1. True
2. True
3. Severe and profound
4. Prodigies

18.2

1. Experiential
2. b) Structural



3. d) Two factor theory

18.3

1. Simon
2. William Stern
3. c) 125
4. Performance test

18.4

1. c) Both of the above
2. c) Divergent
3. b) Terman
4. d) Goleman

MODULE -5

Social Processes and Behavior

This module introduces the learners to the various social processes that influence human behaviour and social functioning. The learners will understand different group processes and their influence on individuals and groups. Further the learners will also understand the concept of leadership, attitude and pro-social behaviour.

19. Group Processes
20. Attitude
21. Pro Social Behavior