UNIT 3 INTELLECTUAL DEVELOPMENT

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3.1 INTRODUCTION

With specific reference to child development, the five types of development are physical, social, emotional, language and cognitive. Cognitive development is concerned primarily with how a child starts to understand his/her environment and gain knowledge. Intellectual development refers to the growth of children in such a way that their brain becomes more and more capable of understanding, analyzing and evaluating concepts to make sense out of the world around. Part of this would be developing skills of concentration, reasoning, etc.

Skill is the special ability, we acquire through learning and practice. This problem solving knowledge is known as wisdom. Our senses: sight, sound, smell, taste, touch act as gateways to all environmental experiences. These experiences develop an understanding of the world around us. We can also refine our understanding with the help of certain skills. Under ‘intellectual development’, we develop ow

### 3.2 OBJECTIVES

After reading this unit, you should be able to:

- discuss relationship of learning and intellectual development;
- discuss various aspects of intellectual development;
- various stages of intellectual development;
- explain the factors affecting intellectual development; and
- suggest some activities for intellectual development

### 3.3 LEARNING AND INTELLECTUAL DEVELOPMENT

Everyone will agree that development is the result of an interaction of growth and learning. If learning is a dominant emphasis, the years are to be filled with systematically planned events of learning, within limitations imposed by growth. Behavioral development results from the cumulative effects of learning. Human experience has concluded that ‘nothing can be taught’ and teaching can only create situations to make learning possible. So learner is the focus of intellectual development. Education facilitates learning of knowledge, skills and manners. It improves personality and performance through intellectual development. The Learning process is simple and practical and it lies in encouraging the child to go for the right answer and right action. Learning shapes the child as a dynamic personality and the child bravely adjusts as a member of the family, peer amongst community friends, and student in the school.

Learning continues in all stages of self-development and it is a life-long process. At the age of two, most children have a vivid imagination but have difficulty distinguishing fantasy from reality. By the age four, most children have a more complicated understanding of time and at seven years, children’s intellectual capabilities become more complex. By this time, children become increasingly able to focus on more than one aspect of an event or situation at the same time. For example, school-aged children can appreciate that doctors though they give painful injections actually cure the diseases. Children of this age are also increasingly able to reason using observation.

### 3.4 INTELLECTUAL DEVELOPMENT AND HUMAN BEHAVIOUR

Intellectual Development is also called ‘Cognitive Development’.

Human behaviour has three aspects:-

* cognitive learning or mental knowledge aspect
* affective feeling or emotional aspect
* conative or psycho-motor aspect
Intellectual Development is acquiring knowledge with understanding and wisdom. We get experiences with our senses of sight, touch, taste, hearing and smell. These experiences are to be related to life by learning, understanding and use. In life and environment, changes occur frequently. The person who is intellectually developed, is able to make a choice of what and when for appropriate action. J.S. Bruner (1964) defines: "Intellectual development is the capacity to deal with several choices, at the same time."

### 3.5 ASPECTS OF INTELLECTUAL DEVELOPMENT

#### 3.5.1 Intelligence

Intelligence is the ability to learn and apply knowledge. Intelligence tests reveal that intellectual growth is rapid in infancy, moderate in childhood and slow in youth.

#### 3.5.2 Sensation to Perception

Sensation refers to the process of sensing our environment through touch, taste, sight, sound, and smell. This information is sent to our brains in raw form where perception comes into play. Perception is the way we interpret these sensations and therefore make sense of everything around us. Sensation becomes a perception when meaning is attached to it. Senses mature by the age of five. Children usually misrepresent sensation. Perception organizes and refines in adolescence. We can sense everything in the environment, light, colors, shapes, smells etc. and all this information is sent to our brain. If we would become conscious of every little detail that surrounds us, our brain would be overwhelmed. Perception makes the selection and chooses the relevant sensations to be processed and turned into perceptions. For example, if you see an aeroplane in the sky, it may look like a bird but our perception makes us realize that it is a big object and it is an aero plane with two wings and hence resembles a big bird.

#### 3.5.3 Concept-Formation

Concept Formation is another important aspect of intellectual development. It is the highest level of thinking and is the re-organizing aspect of a perception. Concepts are learned through experience. Children's first concepts are concrete, identified by sensory qualities. As we grow, we acquire more abstract or theoretical concepts by building on our earlier concrete ideas. For example a young child may understand the concept of a cow. Broadening on this concept, he/she may acquire the concepts of 'farm' and 'farm animals'. A more abstract concept is 'farming' and ultimately an older child will understand the concept of "agriculture", a completely abstract concept. A concept is a generalization that helps to organize information into categories. For example, the concept "square" is used to describe those things that have four equal sides and four right angles. Thus the concept categorizes things whose properties meet the set requirements. Children acquire concepts similar to the way they acquire language. They apply labels and name things imitatively, like pointing and saying "dog". Through conditioning, children will generalize concepts (e.g. saying 'dog' for other small four-legged animals like cats and pigs) as well as discriminate between them (e.g. saying 'dog' for animals that play with them, but saying 'horse' for animals that people ride on). Development of concepts is from vague to clear or from concrete to abstract. Child has poor
concept of 'time' but by learning to discriminate, the child's concepts becomes clear, definite and specific.

3.5.4 Language Development

Language development contributes to mental development. Language according to Jean Piaget (1896-1980), develops between two to seven years of age. Language development reflects child's cognitive abilities and limitations. From eighteen months to five years of age, a child's vocabulary quickly expands from about fifty words to several thousand words. Children can begin to name and actively ask about objects and events. By the time the child is two years he begins to put words together in short phrases, progressing to form simple sentences. Mothers and fathers play a huge part in forming the child's language. Mothers typically adjust their speech to fit the child's level. This is called motherese. It is found in practically every culture on the planet and it has certain common characteristics: The "sentences" are very short, there is a lot of repetition and redundancy, there is a sing-song quality to it, and it contains many special "baby words." It also is embedded in the context of the immediate surroundings, with constant reference to things nearby and activities that are going on here-and-now.

The speech and language development of a child would normally be as follows:

<table>
<thead>
<tr>
<th>Age</th>
<th>Language Development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth</td>
<td>Sounds</td>
</tr>
<tr>
<td>0-3 Months</td>
<td>Differentiating cries- baby uses s different cry for different situations</td>
</tr>
<tr>
<td>4-6 Months</td>
<td>Vocal Play- gurgling, Babbling</td>
</tr>
<tr>
<td>7-12 Months</td>
<td>Speech like babbling including the use of consonants and vowels. First words- &quot;mama&quot;, &quot;doggie&quot;</td>
</tr>
<tr>
<td>1-2 Years</td>
<td>Use of two word questions- &quot;No doggie&quot;?, &quot;Where ball?&quot;</td>
</tr>
<tr>
<td>2-3 Years</td>
<td>Two/three word utterances. Use of attributes- &quot;Big&quot;, &quot;Furry&quot;</td>
</tr>
<tr>
<td>3-4 Years</td>
<td>Combination of four or more words in sentences form</td>
</tr>
<tr>
<td>4-5 Years</td>
<td>Use of long and detailed sentences. Use of &quot;adult like&quot; grammar</td>
</tr>
</tbody>
</table>

Source: (http://www.adders.org/info105.htm-retrieved on 21.4.11)

3.5.5 Memory Development

Memory is the store-house of our earlier experience. Brain-cells memorize experiences. Brain-cells are called neurons. Hurlock and Schwartz analyze (1932) that memory impressions form in the first six months. True remembrance begins by the first year. Memory is strong for persons and objects in the first two years. The child recounts a story by three years. Rote memory is strong up to early childhood and logical memory develops towards late childhood and adolescence. Traditionally, the construct of memory has been divided into a number of different types, defined largely in terms of the length of time over which information is retained or stored. For instance memory is divided into short-term or working memory, in which information can be stored and manipulated for about twenty
seconds and long-term memory, in which information can be stored permanently. Long-term memory can be further divided into storage of procedures or skills, such as how to tie a shoe, and storage of explicit or declarative memories, such as memories of personal events or of general knowledge about the world. The study of the development of each of these systems can aid in understanding the cognitive abilities of both children and adults.

### 3.5.6 Creativity

It refers to the ability to think in novel ways. It is at the root of human progress and can be developed at young age. When we think of creativity, we think of Mozart, Picasso, Einstein—people with a seemingly fated convergence of talent and opportunity. All sorts of people, possessing various levels of intelligence and natural ability, are capable of engaging in fulfilling creative processes. As for example, Shailesh Kumar Sethiya played the harmonica for 12 hours and 20 minutes continuously to break the existing Limca record of 12 hours. With this feat, Shailesh says that he has made it to the Limca Book of Records and is all set to enter the Guinness Book of World Records on May 1, 2010.

(http://www.worldamazingrecords.com/2010/05/music-non-stop-30-hours-world-recod-set.html)

### 3.5.7 Problem-Solving

Thinking and reasoning powers grow around two and a half to three year onwards. Problem solving skills require a person to understand the problem, create a plan to solve the problem, see the plan through and review the plan to ensure that the problem is solved and is not repeated.

### 3.5.8 Positive Thinking

Positive thinking is a mental attitude that admits into the mind thoughts, words and images that are conducive to growth, expansion and success. It is a mental attitude that expects favorable results. Mothering affects thinking. Hormones (Chemical signals from living cells) pass on messages whether of pain or pleasure from the mother to the fetus by the umbilical channel. A positive mind anticipates happiness, joy, health and a successful outcome of every situation and action.

Holistic and healthy personality is based on 'positive thinking'. Thoughts of confidence give strength to face difficulties. Thus Positive thinking results in success.

### Check Your Progress 1

1. a) How does 'sensation' become a 'perception'?  
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   ........................................................................................................

   b) How do we develop a 'perception' into a 'concept'?  
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   ........................................................................................................
   ........................................................................................................
2. What is concept formation?

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3. Briefly describe memory-development?

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3.6 FACTORS AFFECTING INTELLECTUAL DEVELOPMENT

The following factors affect intellectual development. Briefly they are as follows:

i) Heredity: Every child gets some level of intelligence by birth. It can be sharpened or improved by providing experiences.

ii) Physical growth: this helps in the growth of a healthy body and healthy mind.

iii) Natural environment: like fresh air, proper light, large space and greenery around, help in cognitive development.

iv) Family development: involving quality of family-discussions; books and magazines available, experience-enriching opportunities provided, sharpen mental achievements.

v) Socio-economic status: The rich parents provide better opportunities whereas reverse is the case of the poor parents.

vi) School environment: An ideal school having a garden, good library books, well-equipped laboratories, good guidance from teachers; educative co-curricular programmes and formative discipline affect mental development.

3.7 STAGES OF INTELLECTUAL DEVELOPMENT

Jean Piaget (1896-1980) worked on child developmental psychology for fifty years. He divides intellectual development in four stages for the logical and cognitive development of children.

3.7.1 Sensori-motor Stage

The first stage, from birth to two years, is the sensori-Motor stage: the infant's coordination of reflexes and sensory-motor repetition, leading up to basic recall of absent objects and to an experimental search for new means to achieve
pleasurable ends. During the Sensory Motor Stage (1), the baby can activate his basic reflexes such as sucking, grasping, turning his head and it is the origin of mental development. The sensorimotor schemes of infancy permit interactions with the environment that eventually lead to the development of object permanence. Once the children acquire object permanence, however they understand that objects have an existence independent of their perception of them. For instance if a toy is hidden under the blanket then the children who have object permanence will lift up the blanket and start searching for the toy. Through the acquisition of information about self and the world, the baby begins to understand how one thing can cause or affect another, and begins to develop simple ideas about time and space.

3.7.2 Pre-Operational Stage (2-7 years)

During this stage, children's thought processes are in a developing stage, although they are still considered to be far from 'logical thought'. Children in this stage develop cognitive structures called symbolic schemes that allow them to represent objects or events by means of symbols such as language, mental images and gestures. To a child capable of symbolic representation a cloud may resemble a cone ice-cream, a broken handle can be a pistol or an empty box can resemble a castle. This is a period of 'magical thinking' in the sense that the child easily confuses apparent or imagined events with real events. He would, if allowed, jump out of a window expecting to fly, because he has seen birds fly. It is something of a 'dream world'; a toy car is very much the real thing to a toddler. In the preoperational stage children view situations from their perspective and are unable to understand a situation from another person's point of view. For example she is not able to understand the relationship her mother has with her grandmother. The vocabulary of a child is also expanded and developed during this stage, as they change from babies and toddlers into 'little people'. The predominant mode of representation of the world becomes auditory, with memories featuring received commands. Animism is also a characteristic of the Re-operational stage. This is when a person has the belief that everything that exists has some kind of consciousness. A reason for this characteristic of the stage is that the Pre-operational child often assumes that everyone and everything is like him. Since the child can feel pain, and has emotions so must everything else. Re-operational children are usually 'ego centric', meaning that they are only able to consider things from their own point of view, and imagine that everyone shares this view, because it is the only one possible.

3.7.3 Concrete Operational Stage (7-11 years)

The third stage, between 6-12, is the concrete operational stage, when the child can symbolize (i.e. can make a concrete mental image of) operations without having to do them physically. During this stage, the thought process becomes more rational, mature and operational. Concrete Operations permit children to serializing or grouping items. For example they can order objects on some dimension/shape such as shortest to tallest or lightest to heaviest. This process often continues well into the teenage years. The child develops realistic internal imaging of the world around him and by seven or eight years of age a concrete visual mode of representation becomes the predominant way of thinking. He learns to classify and relate, to measure distances and quantities, and thereby performs constructive thinking.
3.7.4 Formal Operational Stage (11-15 years)

The fourth stage, between 12 years to adulthood, is called formal operations stage. This is the beginning of early adolescence where the children learn handling more complex problems that involve more factors. For example they can solve the jigsaw puzzles, correctly arrange things on the basis of color, height and size. In this there is a more objective way of perceiving the world with ability to focus simultaneously on several aspects of a problem - Piaget called this tendency 'decentration'. This permits adolescents to reason beyond a world of concrete reality and evaluate their logical validity without making reference to real-world circumstances. In contrast, concrete operational children can evaluate the logic of statements by considering them against concrete evidence only. For Piaget, intelligence is defined as the ability to adapt to the environment, an ability that depends upon physical and psychological (cognitive) organization. The adaptation process has two complementary components, assimilation and accommodation. Assimilation refers to the tendency to process new information with distortion, in terms of existing cognitive structures. Accommodation refers to the opposite process, that is, the modification of existing cognitive structures in response to new information. An individual strives for equilibrium between assimilation and accommodation, without being neither unrealistic (excessive assimilation) nor excessively realistic and hence disorganized (excessive accommodation).

Thus the above stages conceived by Piaget build upon one another, with each one a requisite for the next. Some children move through the stages more rapidly than others and some do not make it all the way to formal operations. In brief the four agents that encourage the passage from one stage to another are: maturation, experience, social transmission and equilibrium.

<table>
<thead>
<tr>
<th>Age</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>One month</td>
<td>Watches person when spoken to.</td>
</tr>
<tr>
<td>Two months</td>
<td>Smiles at familiar person talking. Begins to follow moving person with eyes.</td>
</tr>
<tr>
<td>Four months</td>
<td>Shows interest in bottle, breast, familiar toy, or new surroundings.</td>
</tr>
<tr>
<td>Five months</td>
<td>Smiles at own image in mirror. Looks for fallen objects.</td>
</tr>
<tr>
<td>Six months</td>
<td>May stick out tongue in imitation. Vocalizes at mirror image. May act shy around strangers.</td>
</tr>
<tr>
<td>Seven months</td>
<td>Responds to own name. Tries to establish contact with a person by cough or other noise.</td>
</tr>
<tr>
<td>Eight months</td>
<td>Reaches for toys out of reach. Responds to &quot;no.&quot;</td>
</tr>
<tr>
<td>Nine months</td>
<td>Shows likes and dislikes. May try to prevent face-washing or other activity that is disliked. Shows excitement and interest in foods or toys that are well-liked.</td>
</tr>
<tr>
<td>Ten months</td>
<td>Starts to understand some words. Waves <strong>bye-bye</strong>. Holds out arm or leg for dressing.</td>
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<td>---------------------</td>
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<tr>
<td>Eleven months</td>
<td>Repeats performance that is laughed at. Likes <strong>repetitive</strong> play. Shows interest in books.</td>
</tr>
<tr>
<td>Twelve months</td>
<td>May understand some &quot;where is...?&quot; questions. May kiss on request.</td>
</tr>
<tr>
<td>Fifteen months</td>
<td>Asks for objects by pointing. Starting to feed self. Negativism begins.</td>
</tr>
<tr>
<td>Eighteen months</td>
<td>Points to familiar objects when asked &quot;where is...?&quot; Mimics familiar adult activities. Know some body parts. Obeys two or three simple orders.</td>
</tr>
<tr>
<td><strong>Two</strong> years</td>
<td>Names a few familiar objects. Draws with crayons. Obeys found simple orders. Participates in parallel play.</td>
</tr>
<tr>
<td><strong>Two-and-a-half years</strong></td>
<td>Names several common objects. Begins to take interest in sex organs. Gives full names. Helps to put things away. Peak of negativism.</td>
</tr>
<tr>
<td>Three years</td>
<td>Constantly asks questions. May count to 10. Begins to draw specific objects. Dresses and undresses doll. Participates in cooperative play. Talks about things that have happened.</td>
</tr>
<tr>
<td>Four years</td>
<td>May make up silly words and stories. Beginning to draw pictures that represent familiar things. Pretends to read and write. May recognize a few common words, such as own name.</td>
</tr>
<tr>
<td>Five years</td>
<td>Can recognize and reproduce many shapes, letters, and numbers. Tells long stories. Begins to understand the difference between real events and make-believe ones. Asks meaning of words.</td>
</tr>
</tbody>
</table>

Source: *Miller-Keane Encyclopedia and Dictionary of Medicine, Nursing, and Allied Health, 5th ed.* and Child Development Institute.
(http://www.childdevelopmentinfo.com.)

### 3.8 ROLE OF TEACHERS AND PARENTS

In Intellectual Development both teachers and parents have significant roles to play. They provide the following: The teacher can help the learner acquire new content in terms of a **familiar** structure. The best method is to help the learner and teach him on a level he can easily understand and the learner can assimilate new content to old structures. It is the teacher's job to promote assimilation and accommodation in the learner.

a) Teachers should allow child to learn through their self efforts. **They** provide opportunities to motivate Infants and children to explore.
How Parents Can Help?

While kids are certainly influenced by peers and popular media, parents impact the development of their children more than any other source. Continuing to read to and with children, playing games and planning outings that are both fun and intellectually stimulating, and encouraging kids' natural desire to make decisions for themselves are all things that parents can do to help their pre-teen children's intellectual development. Parents often feel a bit torn as their kids approach adolescence, fearing the natural separation that can exist between kids as they mature and become increasingly independent. Encouraging and nurturing that independent streak can be a good thing, especially if parents stay involved, even if it is just from the sidelines.

Piaget also stresses the importance of learning from interaction with one's peers. In a group of learners those who are at the lower levels can profit from examples of performance exhibited by other children who are at an advanced stage. This situation also benefits more advanced learners to consolidate their own process of thinking. The loss of egocentrism results in social interaction. Thus Piaget assumes that a child is an active than a passive participant in his own development by providing for interaction among learners the loss of egocentrism is secured with ease and efficiency.

3.9 SUGGESTED ACTIVITIES FOR INTELLECTUAL DEVELOPMENT

The following activities for Intellectual Development of the child can be practiced by the teacher.

1. Story (-making), (-telling), (-writing) and (-listening)
2. Picture (-completion) and (-coloring)
3. Jigsaw puzzles
4. Role-playing: to clarify concept of team games, dowry etc.
5. Seed-germination by real experimentation
6. Paper cut-work and pasting
7. Quiz-questioning & Word-building games
8. Imaginary Compositions story-completion, essay-writing
9. Debates and brain-storming (ideas as a word or sentence on any topic)
10. Problem-solving opportunities
11. Rhymes and simple songs
Check Your Progress 2

1. Name the four stages of Jean Piaget's intellectual development?

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2. Suggest three activities for intellectual development of 3 to 5 years old children

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3. Describe how parents and teacher can contribute to intellectual development?

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3.10 LET US SUM UP

In this unit, we come to know that Intellectual Development deals with primary aspect of behaviour. Our five sense organs collect information and with understanding this information turns into knowledge. Application of knowledge for solving problems is called wisdom.

Through intellectual development you develop many skills like observation, memory, thinking and reasoning etc. Your behavior depends on learning-enrichment. Home, school and society provide such learning-experiences.

The child bravely adjusts to all knowing, feeling and doing aspects of human behaviour and with intellectual development, the child learns to face several situations. Heredity and environment (family and natural) affect intellectual development. Organization of sensory experiences and adaptation are the main processes for intellectual development. Thus Parents and teachers can provide opportunities for the intellectual development of children.

3.11 ANSWERS TO CHECK YOUR PROGRESS

Answers to Check Your Progress 1

1. (a) Sensation becomes a perception when meaning is attached to it.
   (b) The reorganizing aspect of perception is called the concept.

2. Concept formation is the highest level of learning when the child learns to differentiate and discriminate various perceptions.
3. Memory-Development refers to the development of memory impressions, which start from the first six months. Memory is strong for persons and objects in the first 2 years.

Answers to Check Your Progress 2

1. The four stages of Piaget's intellectual development are:
   - Sensory-motor stage
   - Pre-operational Stage
   - Concrete Operational Stage
   - Formal Operational Stage

2. The three activities for intellectual development are: jigsaw puzzle, rhymes and simple songs, paper-cut-work & pasting.

3. Parents and teachers can allow children to learn through their self-efforts. They should provide materials for discovering things on their own and provide motivation to grow their curiosity.

3.12 REFERENCES


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