



MENTAL ABILITY AND EDUCATION

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CONCEPT OF MENTAL ABILITY:

One cannot underestimate the scope of science in today's world. Science is the backbone of human existence. The practical effects of science can be seen in motion everywhere. Science learning requires scientific thinking power and skills which help to understand interrelationships of the natural world, analyze problems, evaluate situations, and synthesize interdisciplinary information to come up with a greater understanding of our world. These skills are collectively known as higher mental abilities or higher order thinking skills. "Thinking



skills are the mental capacities used to investigate the world, to solve problems and to make judgments" (Fisher, 2007, p. 72) Individual needs to apply use his mental abilities and to think creatively so that he is able to develop a fundamental scientific understanding. Higher mental abilities refer to the highest levels of Blooms taxonomy, which Bloom (1956) describes as a generalized way of thinking and solving problems that could be applied to a wide variety of subjects (Boone, Boone & A. Gartin 2005). Bloom identified a hierarchy for classifying instructional objectives in the cognitive domain (Boone et al., 2005). The levels of Blooms Taxonomy are knowledge, the ability to recall information, comprehension, understanding the meaning of the material, application, the ability to use information in new ways, analysis, breaking information into parts, synthesis, putting together different pieces of information, and evaluation, the ability to judge or evaluate information (Bloom, 1956; Boone et al., 2005, Fisher, 2007, Passige, 2007, Zohar, 2004). The levels of application, analysis, synthesis, and evaluation are all considered to be higher order thinking skills, which require the levels of knowledge and comprehension, but are used to solve problems. (as cited in Laura A. Weis, 2008). People exhibit significant individual difference in the cognitive processing and do not approach scientific task in same manner cognition or higher mental process play a very important role in science learning. These higher mental abilities play a vital role in individual person's capacity to complex science learning. Differences in mental abilities have a hierarchical structure, from narrow specific abilities to general ability. Differences in mental ability have some modest predictive validity for real life outcomes. Cognitive and biological bases of differences in mental ability are being explored but are not yet understood.

Good (1973) defines higher mental process as one of the most complex form of mental activities involving highly organized processes. Usually with an element of conscious control as in reasoning, memory, imagination, aspiration, or voluntary attention, it refers to the cognitive domain. It is very essential to understand the role of higher mental abilities of students in science learning as teaching science and cultivating them to be scientifically literate citizen is the goal around the world.

Teaching learning process aims at acquiring and understanding knowledge. Higher mental abilities are neither tested nor accelerated. It is very essential to know the mental activities and the abilities and students should be identified at proper time and channelized properly to give fruitful result. According to D.S Kothari "one thing is certain; yesterday's educational system will not meet

today and even less to the needs of tomorrow.

GENERAL MENTAL ABILITY:

General mental ability (GMA) is a term used to describe the level at which an individual learns, understands instructions, and solves problems. Tests of general mental ability include scales that measure specific constructs such as verbal, mechanical, numerical, social, and spatial ability. The overall score is considered the most important factor, explaining more variation in individual performance than specific abilities. Green (1989) showed that mental techniques are the most common ones in improving the performance of athletes in competitive situations. Mental practice is the cognitive rehearsal of a physical skill in the absence of overt physical movement. This imagination leads to creation of nerve impulses similar to those generated during real performance. Along with learning skills and achieving a higher level of performance, creating coordination between the mind and the body gains importance.

Elements of General Mental ability

General Mental ability is complex in nature and comprise of number of aspects which varies individual to individual. The elements of general mental ability as determined by various psychologists are as follows:

1) Figural relations: It is a capacity to understand and ability to manipulate objects. Human beings used to deal with machine parts, tools, puzzle completions, graphs, etc. or they are working fast with their hands, to get expertization on them. This is also called 'concrete intelligence' and 'performance IQ' by psychologists.

2) Numerical ability: It deals with symbols means basically a mental exercise. It is a capacity to think effectively with words as symbols as well a 'numbers' as symbols is included. Hence, it is also known as 'verbal ability' and 'numerical ability'. On one hand experienced teachers, writers, journalists and linguists are likely to excel in verbal ability whereas, on the other hand, mathematicians, statisticians, scientists etc. are likely to excel in 'numerical ability'. The best combination of verbal and 'numerical ability' is called 'abstract intelligence' by psychologists.

3) Semantic ability: It is the aptitude to deal with 'meanings' or to read between the lines. It also incorporates originality, flexibility, foresight and shifting of meaning from the material at hand towards brevity and conciseness. Semantic ability also called 'insight into written material with originality'.

4) Behavioural ability: It is the ability to deal effectively with other people, to assess and critic the behaviour of Individuals or group of individuals. It includes the capacity to understand emotions, actions, interactions and outcomes of relations of persons to each other. Behavioural ability is also known as 'Social Intelligence'.

All the above mentioned elements are absolutely essential in the life of every human being. Coordination between the relationship of parent and child, teacher and taught as well as employee and employer, superior and subordinates-all are depend upon the capacity to understand as well as to evaluate human behaviour.

Applications of General Mental ability

Individuals differ in their styles of application of intellect. Some excel in one while others excel in other styles. The various applications of intellect are:

a) Comprehension: It deals with the grasp as well as the understanding level of given material; it also deals with the knowledge level of an individual. Hence, comprehension is also called cognitive style.

b) Retention: It is followed by comprehension, some persons are able to transfer the material into 'retention' and are able to recall it quickly. The key to success is recalling the right matter at the right time, with accuracy as well as speed. Retention is also known as 'memory ability'.

c) Reasoning: It deals with the logical application of comprehended and retained material. It is the ability to understand objects relation, relations of ideas, ability of analysis and synthesis, and convergent and divergent thinking. Reasoning considered to be a style of higher order complex

mental ability.

d) Evaluation: It deals with the reaching at final decision, at an outcome, conclusion and implication, after reasoning, analysis and logical thinking have been applied. The evaluation style improves the individual's problem solving ability, and insight and foresight regarding problems. This is most helpful usually while dealing with other persons and social situations like group conflicts and communal tensions.

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