

**A STUDY OF HIGHER MENTAL ABILITY IN SCIENCE AMONG JUNIOR
COLLEGE STUDENTS OF JALNA DISTRICT**

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Abstract

Present research Aims to study Higher Mental Ability in Science among Junior College Students of Jalna District. The sample of the study was selected by Proportionate Stratified Random Sampling method which includes 500 junior college students from eight talukas of Jalna District studying in science stream .Tool used for the research was standardized 'Test of higher mental ability in science (THMAS)' by Dr.D.N.Sansanwal. Research finding reveals that the higher mental ability in science of junior college students is average. The Application ability in science of junior college students was found average, whereas the Analysis, Synthesis and Evaluation ability respectively was found to be is low. Result also revealed that there is significant difference between application analysis, synthesis ability of male and female students and no significant difference between evaluation ability of male and female students.

Key Words: *Higher Mental Ability in Science, Application, Analysis, Synthesis and Evaluation.*

Introduction: 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. From path breaking discoveries in atomic science to discovery of new vaccines in life science, to technological advancements in the field of communication, transportation and even weather prediction, science has left no aspect of human's untouched.

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 & 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, Passig, 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's and even less to the needs of tomorrow. Science is taught at lower secondary level as an integrated whole than as a compartmentalized discipline. Discipline-oriented teaching and learning commence at 11th and 12th standards young students, particularly the brighter ones amongst them, are drifting away from science. This is a matter of serious concern. It indicates that students do not opt for science as a first choice but as a last one. Present scenario is that a large number of students corresponding to the age group 16-18 years are unmotivated and uninterested in higher science education. (as cited in science education, p.71-72).

After completing SSC, students enter junior college and select stream of their interest. Present research aims to study higher mental abilities in science it will help in earlier identification and selection of best talents. There is an urgent need to place the child and his mental abilities at the centre of the edifice of education. In today's competitive world education has come to realize that child is not a plastic material and is not so susceptible to be molded and put into a shape as desired and decided upon by parents and educators emphasis has to be laid on the needs, aptitudes, interests, mental abilities of child and accordingly choose his own courses and career.

Objectives of the study:

1. To study the higher mental ability in science of junior college science students.
2. To study the higher mental ability in science of junior college science students with respect to application, analysis, synthesis, and evaluation.
3. To compare higher mental ability in science with reference to application, analysis, synthesis, and evaluation) of male and female junior college science students.

Hypotheses of the study:

1. Higher mental ability in science of junior college science students is average.
2. The higher mental ability in science of junior college science students with respect to application, analysis, synthesis, and evaluation is average.
3. There is no significant difference between higher mental ability science (viz application, analysis, synthesis, and evaluation) of male and female junior college students.

Methodology:

Method: Survey method of research was employed to study Higher Mental Ability in Science among Junior College science stream Students of Jalna District.

Sample: A sample comprises of 500 (261male and 239 female) junior college students of Jalna District selected by Proportionate Stratified Random Sampling method.

Tools: Tool used for the research was ‘Test of higher mental ability in science (THMAS)’ by Dr.D.N.Sansanwal.

Statistical Analysis: Mean, SD, and t-test were used to analyze the data.

Analysis and interpretation of result

Hypotheses 1: Higher mental ability in science of junior college science students is average.

Table 1- Showing Higher Mental Ability in Science of junior college students

Higher mental ability in science	N	Mean	S.D	Interpretation
	500	11.17	4.62	Average.

It is inferred from the table 1 that the obtained mean value 11.17 which indicates average Higher mental ability in science of junior college students of Jalna District.

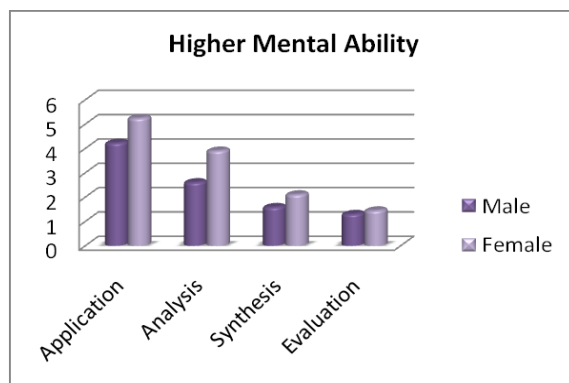
Hypotheses 2: The higher mental ability in science of junior college science students with respect to application, analysis, synthesis, and evaluation is average.

Table 2:- Showing the higher mental ability in science of junior college science students

Higher Mental Abilities	N	Mean	Std. Deviation	Interpretation
Application	500	4.72	1.916	Average
Analysis	500	3.23	2.104	Low
Synthesis	500	1.84	1.160	Low
Evaluation	500	1.37	1.135	Low

It is inferred from table 2 that the obtained mean value 4.72 indicates that Application ability of junior college students is average. Whereas the obtained mean value 3.23, 1.84, and 1.37 indicates that Analysis, Synthesis and Evaluation ability respectively is low.

Graph 1-Showing the higher mental ability in science of junior college science students



Hypotheses 3: There is no significant difference between higher mental ability in science (viz application, analysis, synthesis, and evaluation) of male and female junior college students.

Table 3:- Showing significant difference between higher mental ability in science of male and female junior college students.

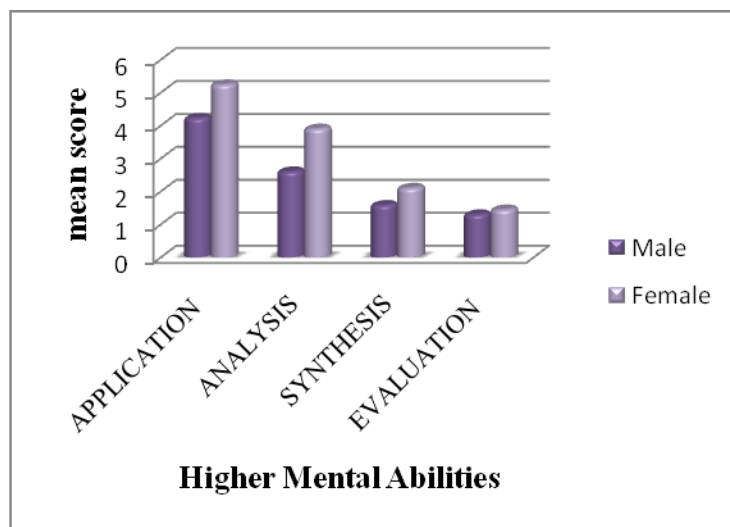
HMA	Gender	Mean	S.D	t value	Interpretation
Application	M	4.23	1.87	6.119	Significant
	F	5.25	1.82		
Analysis	M	2.61	2.08	7.242	Significant
	F	3.91	1.91		
Synthesis	M	1.59	1.19	5.202	Significant
	F	2.11	1.06		
Evaluation	M	1.30	1.05	1.432	Insignificant
	F	1.45	1.21		
<i>F-Female, M- Male</i>				<i>df = 498</i>	

Table 3 reveals that the obtained 't' value is 6.119, 7.242, 5.202 with respect to application, analysis and synthesis ability of male and female junior college students respectively is greater than the tabled 't' value (1.96) at 0.05 level which indicates that there is significant difference in application, analysis and synthesis ability between male and female junior college students.

Further the mean score of female students is greater than that of male students. Hence, it is concluded that application, analysis and synthesis ability of female students is more than male students.

The obtained 't' value 1.432 with respect to evaluation ability of male and female junior college students is less than the tabled 't' value (1.96) at 0.05 level which indicates that there is no significant difference in application ability between male and female junior college students

Graph 2:- Showing significant difference between higher mental ability in science of male and Female junior college students.



Findings: Research finding reveals that the higher mental ability in science of junior college students is average. The Application ability in science of junior college students is average, whereas the Analysis, Synthesis and Evaluation ability respectively was found to be is low. Results also revealed that there is significant difference between application analysis, synthesis ability of male and female students and no significant difference between evaluation ability of male and female students. Further it is found that application; analysis and synthesis ability of female students is more than male students.

Conclusion: In the ideal educational environment for science stream students it is essential identify students' individual differences, with regards to higher mental ability and thus can provide them with learning material individually selected and structured. Teacher should provide learners the ability to use different instructional modes in order to accommodate their individual needs and to improve their performance. The findings of present research revealed that the students of junior college possess low analysis, synthesis and evaluation ability which are higher mental abilities required for science learning. It is very essential obtain strategies which will enhance students mental abilities. It is most important to give them proper guidance and adopt strategies which will improve their problem solving ability. Moreover science education requires

higher mental abilities hence screening out students who possess these abilities is necessary so that they can get success through their abilities this will save their future. It is important for teachers to be aware of mental abilities. Such insight could inspire teachers to adapt their instruction to help students. Finally it can be concluded that the results can be helpful to design education and work, teachers need to respect different users learning modes and utilize proper ways to gain better learning effect. It is important to teach students how to think and use higher order thinking skills, such as analysis, evaluation, and synthesis.

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