

SCIENTIFIC APTITUDE OF HIGHER SECONDARY STUDENTS OF SABARKANTHA DISTRICT

SHVETA A. JOSHI

Research Scholar, IITE Gandhinagar

INTRODUCTION:

Aptitude is the special skills of a person in a certain activity or area. Aptitude is "a combination of characteristics indicative of an individual's capacity to acquire (with training) some specific knowledge skill, or a set of organized responses, such as the ability to speak a language, to become a musician, to do a mechanical work." The person's ability to pick up new knowledge or skills following training is determined by a mixture of traits and environment. Hence, aptitude is neither entirely genetic nor environmental. Certain aspects may be inborn, like playing musical instruments or precision in watchmaking, or other such skill sets can be improved through practice and training. People with the same intelligence may differ in their aptitude for different aspects.

Scientific aptitude is complex of interacting hereditary and environmental determinants producing pre-dispositions or abilities. Scientific Aptitude is another example of talent present in the gifted group so far greater extent than its probable realization in adult achievement. We can identify to an extent, certain, not all, characteristics possessed by individuals who succeed later in scientific endeavor. Scientific Aptitude Test (SAT) is intended to measure the potential ability of a person to pursue a course of training in the field of science and to seek special help who are found to be weak in the field of science related subjects. Scientific Aptitude Test (SAT) is intended to measure the potential ability of a person to pursue a course of training in the field of Science related subjects. Scientific Aptitude testing combined with the other relevant information received, would help to a greater extent in avoiding considerable wastage of human as well as material resources by placement of individuals in places and lines of work in which they are most likely to be Productive. Dimensions of Scientific Aptitude Test: The dimensions of the Scientific Aptitude Test are Experimental bent, Ability to reason, Logical conclusion, Ability to draw conclusion, Ability to interpret, Scientific interest, Ability to solve general problems and Accuracy of observation.

Mishra (2020), the concept of achievement comprises the interaction of three elements, including aptitude, readiness, and learning opportunities. The study's goal was to establish whether there was a substantial difference in the level of scientific aptitude depending on factors like gender and location. The Normative Study type's descriptive methodology was used. For the study, 100 pupils were chosen as a sample from West Bengal's Senior Secondary schools. Scientific Aptitude Test (SAT) instrument created by Shahapur and Rao is the tool used for the study (2006). The study found that boys had higher levels of scientific aptitude than girls do, and pupils in urban areas have higher levels of scientific aptitude than students in rural areas.

Heller (2007) went into more depth about the Munich Dynamic Ability Achievement Model (MDAAM), which is an expanded version of the Munich Model of Giftedness (MMG). Additionally, the theoretical background of the empirical data from the author's research of scientific aptitude and technical creativity will be discussed. Finally, several approaches are presented, with sex-related issues being touched upon, for developing scientifically and creatively gifted adolescents and adults. The fictitious concept of "scientific aptitude" might be described as the capacity for scientific thought or as a unique gift for achievement in the (natural) sciences. Like this notion, "scientific creativity" or "technical creativity" can be thought of as personal and social abilities for coming up with creative solutions to challenging technical and scientific challenges. A definition must include both descriptive and explicative terms in order to be both theoretically and practically useful. This calls for various research approaches, which will be illustrated with reference to a number of study instances.

Paulmathi L. (2016). A Study of Scientific Attitude and Academic Achievement in Science of Secondary School Students in Thane City. The major objectives of the study were: a) To find out the scientific attitude of secondary school students in Thane city. b) To ascertain the scores of academic achievements in science of secondary school students in Thane city. c) To find out the relation between scientific attitude and academic achievement in science of secondary school students in Thane city. The major findings were: The following conclusion can be drawn by testing of hypothesis. 1. There is no significant difference between the scientific attitude of boys and girls of secondary school students in Thane city. 2. There is no significant difference in mean value of a achievement scores of boys and girls of secondary schools in Thane city.

Amit Ahuja (2017). Study of Scientific Attitude in relation to Science Achievement Scores among Secondary School Students. The major objectives of the study were: To study gender differences among boys and girls at

secondary school level with respect to scientific attitude. 2. To study gender differences among boys and girls at secondary school level with respect to science achievement scores. The major findings were: 1. secondary school students differ significantly in science achievement. This also shows that the significance of mean-square of gender as variable indicates that the means for A1 (Boys) and A2 (Girls) averaged over the levels of scientific attitude differ significantly. 2. science achievement of secondary school students belonging to different levels of scientific attitude, that is very high, average and very low, differs significantly.

STATEMENT OF PROBLEMS:

In present research researcher has tried to study the scientific aptitude of higher school students of sabarkantha district with regards to gender and area of residence. The problem of the present research is “Scientific aptitude of higher secondary students of sabarkantha district”.

Objectives:

1. To study the scientific aptitude of Male and Female higher secondary school student of sabarkantha district.
2. To study the scientific aptitude of Urban and Rural higher secondary school student of sabarkantha district.
3. To study the scientific aptitude of Male Urban and Male Rural higher secondary school student of sabarkantha district.
4. To study the scientific aptitude of Female Urban and Female Rural higher secondary school student of sabarkantha district.

HYPHOTHESIS:

1. There is no significant difference between Male and Female students of higher secondary school students of sabarkantha district in relation to their scientific aptitude.
2. There is no significant difference between Urban and Rural students of higher secondary school students of sabarkantha district in relation to their scientific aptitude.
3. There is no significant difference between Male Urban and Male Rural students of higher secondary school students of sabarkantha district in relation to their scientific aptitude.
4. There is no significant difference between Female Urban and Female Rural students of higher secondary school students of sabarkantha district in relation to their scientific aptitude

SAMPLE:

In present research stratified random sampling technique was used. Total Sample is categorized as under.

	Male	Female	Total
Urban	30	30	60
Rural	30	30	60
Total	60	60	120

VARIABLES:

In present research gender and area of residence of higher secondary schools of sabarkantha district were taken as independent variables and scores of scientific aptitude test was taken as dependant variable.

TOOL:

1 Scientific Aptitude Test Battery (SATB) by Dr. K.K Agarwal and Saroj Arora

This is a battery of containing 210 items divided into four sub-tests-(i) Reasoning ability, (ii) numerical ability, (iii) science information, and (iv) science vocabulary and time required for each subtest is 25, 30, 20 and 15 minutes respectively

Reliability

Two methods have been used for computing the reliabilities of each test constituting the battery, viz., (i) test-retest, and (ii) split- half method. Below are given the reliabilities of each test:

**JOURNAL OF INFORMATION, KNOWLEDGE AND RESEARCH IN
HUMANITIES AND SOCIAL SCIENCE**

Sr. No.	Type of Test	Test retest	Split-half
1	Reasoning Test	.90	.91
2	Numerical Ability Test	.91	.91
3	Science Information Test	.84	.84
4	Science Vocabulary Test	.93	.84
	Entire Battery	.94	.93

VALIDITY

The items of the test battery have been found to discriminate well between high and low scores. Further most of the items reveal positive high correlations with total scores. All the tests consist of homogenous items and can discriminate between poor and bright children.

The battery of the tests has been validated against high school examination marks in science, mathematics and total. The validity co-efficient being .59,.57 and .58 respectively which are quite satisfactory.

SCORING

The responses are scored conveniently with the help of scoring key in this manual. The wrong and left out questions are crossed out and then the number of correct answers is counted, which is a raw score. Here one score is allotted for one correct answer and no marks are deducted for wrong answer. There are 210 maximum marks on the full battery.

Response	Mark
Correct	1
Wrong	0

PROCEDURE:

After establishing the rapport with selected students of higher secondary school of sabarkantha district. Scientific Aptitude Test was administered in small manageable group of Higher School students of Sabarkantha District. Instructions were strictly followed which have been shown in the manual of scientific aptitude test. Responses of students of higher secondary school on scientific aptitude test were scored by scoring key of manual of scientific aptitude test.

Statistical Analysis:

To analyse the data t test was used. Each Hypotheses was tested at 0.01 and 0.05 level of significant.

Table No-1

Mean, SD, and t Value of Scientific aptitude of Male and Female Students of Higher secondary school of Sabarkantha District

Group	N	Mean	SD	T	Level of Significance
Male	60	49.23	7.22	2.74	0.01
Female	60	52.83	7.10		

The result of table no 1 shows that the t value of scientific aptitude of Male and Female Students of Higher secondary school of Sabarkantha District is 2.74. Mean scores of Male students of Higher secondary school of Sabarkantha District with SD 49.23 and 7.22 respectively and Mean scores of Female students of Higher secondary school of Sabarkantha District with SD 52.83 and 7.10 respectively. The results indicate that the Mean scores of Scientific aptitude of Male and female students higher secondary school students is found significant at 0.01 level it means that the null hypothesis, "There is no significant difference between Male and Female students of higher secondary school students of sabarkantha district in relation totheir scientific aptitude" is rejected. It implies that significant difference was found between Male and Female students of higher secondary school students of sabarkantha district in relation to their scientific aptitude. Here Female higher secondary students have found better scientific aptitude than Male higher secondary students.

Table No-2

Mean, SD, and t Value of Scientific aptitude of Urban and Rural Students of Higher secondary school of Sabarkantha District

Group	N	Mean	SD	T	Level of Significance
Urban	60	57.26	7.86	3.26	0.01
Rural	60	52.82	7.10		
Group	N	Mean	SD	T	Level of Significance
Female Urban	30	59.32	7.01	2.97	0.01
Female Rural	30	55.90	5.61		

The result of table no 2 shows that the t value of scientific aptitude of Urban and Rural Students of Higher secondary school of Sabarkantha District is 3.26. Mean scores of Urban students of Higher secondary school of Sabarkantha District with SD 57.26 and 7.86 respectively and Mean scores of Rural students of Higher secondary school of Sabarkantha District with SD 52.82 and 7.10 respectively. The results indicate that the Mean scores of Scientific aptitude of Urban and Rural students higher secondary school students is found significant at 0.01 level it means that the null hypothesis, “There is no significant difference between Urban and Rural students of higher secondary school students of sabarkantha district in relation to their scientific aptitude” is rejected. It implies that significant difference was found between Urban and Rural students of higher secondary school students of sabarkantha district in relation to their scientific aptitude. Here Urban higher secondary students have found better scientific aptitude than Rural higher secondary students.

Table No-3

Mean, SD, and t Value of Scientific aptitude of Male Urban and Male Rural Students of Higher secondary school of Sabarkantha District

The result of table no 3 shows that the t value of scientific aptitude of Male Urban and Male Rural Studentsof Higher secondary school of Sabarkantha District is 3.03. Mean scores of Male Urban students of Higher secondary school of Sabarkantha District with SD 55.19 and 8.22 respectively and Mean scores of Male Rural students of Higher secondary school of Sabarkantha District with SD 50.74 and 7.89 respectively. The results indicate that the Mean scores of Scientific aptitudeof Male Urban and Male Rural students higher secondary school students is found significant at 0.01 level it means that the null hypothesis, “There is no significant difference between Male Urban and Male Rural students of higher secondary school students of sabarkantha district in relation to their scientific aptitude” is rejected. It implies that significant difference was found between Male Urban and Male Rural students of higher secondary school students of sabarkantha district in relation to their scientific aptitude. Here Male Urban higher secondary students have found better scientific aptitude than Male Rural higher secondary students.

Table No-4

Mean, SD, and t Value of Scientific aptitude of Female Urban and Female Rural Students of Higher secondary school of Sabarkantha District

Group	N	Mean	SD	T	Level of Significance
Male Urban	30	55.19	8.22	3.03	0.01
Male Rural	30	50.74	7.89		

The result of table no 4 shows that the t value of scientific aptitude of Female Urban and Female Rural Students of Higher secondary school of Sabarkantha District is 2.97. Mean scores of Female Urban students of Higher secondary school of Sabarkantha District with SD 59.32 and 7.01 respectively and Mean scores of Female Rural students of Higher secondary school of Sabarkantha District with SD 55.90 and 5.61 respectively. The results indicate that the Mean scores of Scientific aptitude of Female Urban and Female Rural students higher secondary school students is found significant at 0.01 level it means that the null hypothesis, “There is no significant difference between Female Urban and Female Rural students of higher secondary school students of sabarkantha district in relation to their scientific aptitude” is rejected. It implies that significant difference was found between Female Urban and Female Rural students of higher secondary school students of sabarkantha district in relation to their scientific aptitude. Here Female Urban higher secondary students have found better scientific aptitude than Female Rural higher secondary students.

CONCLUSIONS:

1. Significant difference was found between Male and Female students of higher secondary school students of sabarkantha district in relation to their scientific aptitude. Here Female higher secondary students have found better scientific aptitude than Male higher secondary students.
2. Significant difference was found between Urban and Rural students of higher secondary school students of sabarkantha district in relation to their scientific aptitude. Here Urban higher secondary students have found better scientific aptitude than Rural higher secondary students.
3. Significant difference was found between Male Urban and Male Rural students of higher secondary school students of sabarkantha district in relation to their scientific aptitude. Here Male Urban higher secondary students have found better scientific aptitude than Male Rural higher secondary students.
4. Significant difference was found between Female Urban and Female Rural students of higher secondary school students of sabarkantha district in relation to their scientific aptitude. Here Female Urban higher secondary students have found better scientific aptitude than Female Rural higher secondary students.

REFERENCES:

- 1 **Mishra, S. (2020).** Scientific Aptitude and Academic Achievement of Students in Mathematics. *International Refereed/Peer Reviewed Journal of Education*, 6.
- 2 **Heller, K. A. (2007).** Scientific ability and creativity. *High Ability Studies*, 18(2), 209-234.
- 3 **Paulmathi L. (2016).** A Study of Scientific Attitude and Academic Achievement in Science of Secondary School Students in Thane City. *Anveshana's International Journal of Research in Education, Literature, Psychology and Library Sciences* Volume 1, Issue 1.
- 4 **Amit Ahuja (2017).** Study of Scientific Attitude in relation to Science Achievement Scores among Secondary School Students. *Educational Quest: An Int. J. of Education and Applied Social Science: Vol. 8, No. 1, pp. 9-16.*