International Journal of Law, Education, Social and Sports Studies (IJLESS)
*A Peer Reviewed (Refereed) International Research Journal*
Homepage:www.ijless.kypublications.com

RESEARCH ARTICLE

ISSN:2394-9724

# A STUDY ON MEASUREMENT OF SCIENTIFIC APTITUDE AMONG XI STANDARD STUDENTS IN ERODE DISTRICT, TAMIL NADU

**SUDHA. S*[1], ARTHY POORNIMA. T, VASUKI. R**
[1]Assistant Professor in Physical Science, Oxford College of Education, Trichy.
[2]Assistant Professor in Commerce, Oxford College of Education, Trichy.
[3]Assistant Professor in History, Oxford College of Education, Trichy

**SUDHA. S**

Scan The Above QR Code For Article Details

**ABSTRACT**

Scientific aptitude is the application of general intellectual capacity to scientific materials and problems. A test of scientific aptitude, therefore, should be regarded as a device intended to estimate the probability of success in scientific and engineering occupations. Scientific Aptitude Test is a test meant for the assessment of the ability of an individual's performance in science. The study is to measure the "scientific aptitude among XI standards students in Erode District" and to determine the significant difference between the scientific aptitude of XI standard students based on Gender, locality, medium of instruction and types of schools. The study is limited to XI standard science students in and around of Erode district of Tamil Nadu. XI students sample of 388 students are selected from 6 higher secondary schools in Erode. The Normative survey method was used to find out scientific aptitude among XI standard students in Erode District. A standardized tool developed by C.R. Rao and Nagappa P. Shahapur(2006) was used to measure the scientific aptitude of XI standard students in Erode District. The study reveals that there is a significant difference in scientific aptitude based on different types of schools, gender, locality (rural & urban) and medium of instruction. The study also reveals that the scientific aptitude of XI standard students of Erode district is high. It is also recommended to give assignments and simple project works to science students in order to further improve the scientific aptitude of students.

**Keywords:** Science, Scientific aptitude, SAT, aptitude in Science.

©KY Publications

## INTRODUCTION

Teaching of everyday science for everybody has become an unavoidable part of general education. It includes a school's curriculum for the same reasons as any other subject, but in addition, science inculcates certain special values peculiar to it and which no other subject can provide. But besides satisfying the usual needs for its inclusion as a subject in the curriculum such as intellectual, cultural, moral, aesthetic, utilitarian as well as vocational values—science learning provides training in scientific method and also helps to develop a scientific attitude of mind in the learner. The qualities imbibed by the learner through learning science are of great value to a citizen living in the society. Hence, science is a compulsory subject in every system of school education right from the elementary stage. Like-wise, without good scientific aptitude an individual does not perform much in science. The phrase **'Scientific aptitude'** involves a complex of interacting hereditary and environmental determines which produce the pre-dispositions or abilities spoken as scientific aptitude. The scientific aptitude implies that persons possessing certain characteristics can be identified and that many

individuals can succeed in Scientific endeavour. These characteristics include mental activity, creative abilities, and capacity for critical thinking, ability to see relationships, suspended judgements, and open-mindedness. The scientific aptitude predicts achievement of pupils in science and also in allied subject.

**NEED AND SIGNIFICANCE OF THE STUDY:**

**Scientific Aptitude Test** would help to identify the potentialities for science courses as well as to improve the academic achievement in sciences at various levels. Hence, there is a need to measure the **scientific aptitude of XI standard** students.

**OBJECTIVES OF THE STUDY:**

- To study about scientific aptitude among higher secondary students in Erode district.
- To determine the significant difference between the scientific aptitudes of XI standard students based on Gender (boys & girls).
- To determine the significant difference between the scientific aptitudes of XI standard students based on locality (rural and urban).
- To determine the significant difference between the scientific aptitudes of XI standard students based on medium of instruction (English and Tamil medium).
- To determine the significant difference between the scientific aptitudes of XI standard students based on different type of schools (Government, Private and Aided schools).

**LIMITATIONS OF THE STUDY:**

The present investigator has the following delimitations:

- Within the limited time, it is not possible to carry out the research study to a large area. So, the area of investigation is around Erode District.
- The study is meant for science students only.

**METHOD OF STUDY AND SAMPLES USED**

388 students from XI standard are selected from 6 higher secondary schools in Erode.

Out of 388 students, 239 were boys and 149 were girls. Among urban schools 101 girls and 133 are boys. 106 boys and 48 girls are selected from rural schools. The Normative survey method is used to find out scientific aptitude among XI standard students in Erode District.

**TOOLS USED IN THE STUDY**

In the present study, standardized tool developed by C.R. Rao and Nagappa P. Shahapur (2006) is used to measure the scientific aptitude of XI standard students in Erode District. The reliability co-efficient for the whole test is **0.8518**. Predictive value of the test is calculated by correlating the scores in the test with school achievement as an extend criterion. The validity co-efficient is **0.9229.**

**COLLECTION OF DATA**

On a fixed date, the investigator has visited the first school. The stipulated number of students according to the sample design is selected from the first school. The students are asked to sit in a separate class-room leaving enough space between them. The final study tool is distributed to them and necessary instructions are given. No time limit is given but the students took only 60 minutes to complete the test. The same procedure is followed in the rest of the schools.

**SCORING SCHEME**

The scoring of the tool has been done according to the instructions given in the manual. The maximum score that a pupil can get is **80** and the minimum is **0**.

**ANALYSIS AND INTERPRETATION OF DATA**

The data collected were analysed with the help of a package called **Scientific Aptitude Test (SAT).** Thus, the levels of significance are useful in the acceptance or rejection of a hypothesis. If big samples (N>30) are tested, then critical values for

0.05 level of significance = 1.96 and

0.01 level of significance = 2.58

As the 'sample distributions' follow the normal curve pattern. If small samples (N<30) are tested then the't' table, we require the size of the sample N and degrees of freedom 'df'.

**Mean, S.D., and 't'- value of boys & girls:**

**Hypothesis 1:**There is no significant difference between the scientific aptitude of higher secondary students based on Gender (boys and girls).

**Table 1:**Significance of difference in scientific aptitude of XI standard boys and girls.

| Sl. No. | Variable | N | Mean | Standard Deviation | Calculated t-Value | Table value | Remarks |
|---|---|---|---|---|---|---|---|
| 1 | Boys | 239 | 29.81 | 7.10 | 10.60 | 1.96 | S |
| 2 | Girls | 149 | 37.48 | 6.83 | | | |

***** Significant level at 0.05 level.

From the above table, the calculated't' value **10.60** is greater than the table value of 1.96 at 0.05 level. Hence, the above hypothesis is rejected. There is significant difference between the mean scientific aptitude scores of boys and girls is significant.

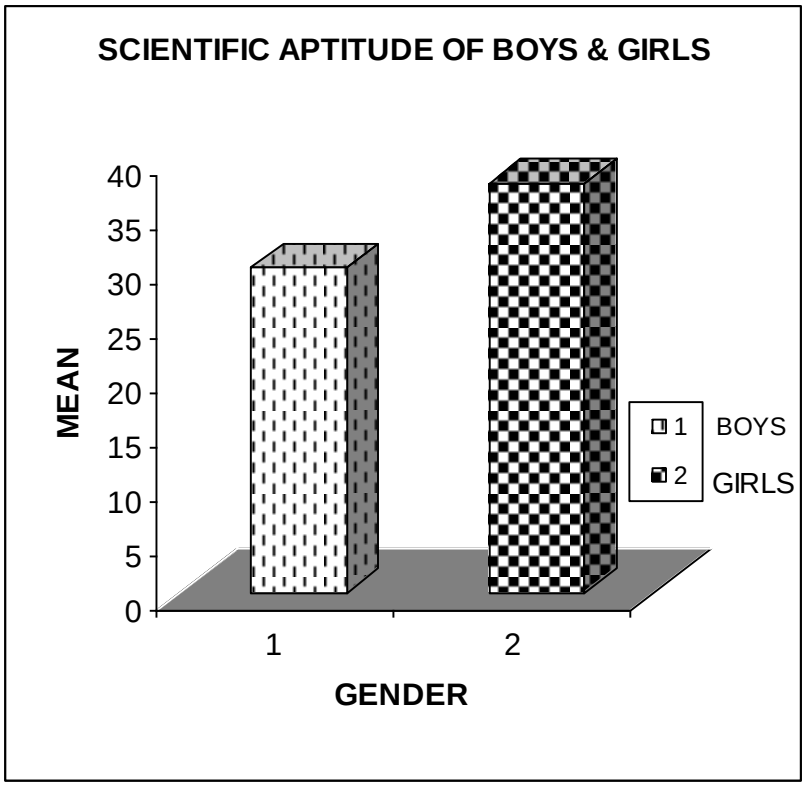


**FIG.1 SHOWING MEAN & S.D. VALUE OF SCIENTIFIC APTITUDE AMONG XI STANDARD STUDENTS BASED ON GENDER (BOYS & GIRLS).**

**Mean, S.D., and 't'- value of rural and urban students:**

**Hypothesis 2:**There is no significant difference between the scientific aptitude of higher secondary students based on Locality (Rural and Urban).

**Table 2:** Significance of difference in scientific aptitude of XI standard rural & urban.

| Sl. No. | Variable | N | Mean | Standard Deviation | Calculated t-Value | Table value | Remarks |
|---|---|---|---|---|---|---|---|
| 1 | Rural | 154 | 29.6 | 7.72 | 6.40 | 1.96 | S |
| 2 | Urban | 234 | 34.7 | 7.49 | | | |

* Significant level at 0.05 level.

From the above table, the calculated't' value **6.40** is greater than the table value of 1.96 at 0.05 level. Hence, the above hypothesis is rejected.There is difference between the mean scientific aptitude scores of rural and urban school students are significant.

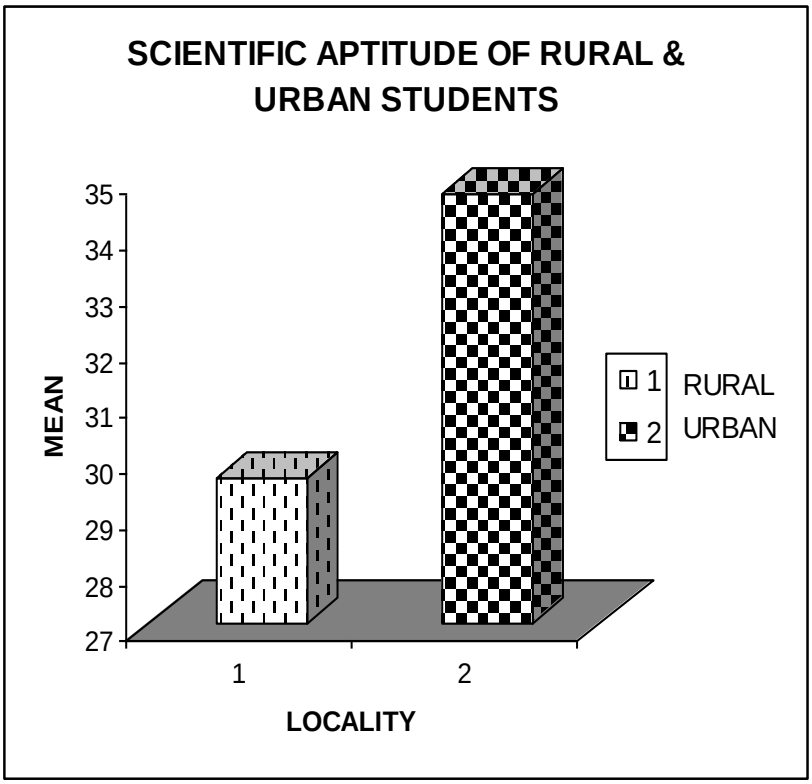


**FIG.2 SHOWING MEAN & S.D. VALUE OF SCIENTIFIC APTITUDE AMONG XI STANDARD STUDENTS BASED ON LOCALITY (RURAL & URBAN).**

**Mean, S.D., and't'- value of Tamil & English medium:**

**Hypothesis 3:**There is no significant difference between the scientific aptitude of higher secondary students based on Medium of instruction (English and Tamil).

**Table 3**: Significance of difference in scientific aptitude of XI standard Tamil & English medium.

| Sl. No. | Variable | N | Mean | Standard Deviation | Calculated t-Value | Table value | Remarks |
|---|---|---|---|---|---|---|---|
| 1 | Tamil | 219 | 30.8 | 7.38 | 5.21 | 1.96 | S |
| 2 | English | 169 | 35.1 | 8.13 | | | |

* Significant level at 0.05 levels.

From the above table, the calculated 't' value **5.21** is greater than the table value of 1.96 at 0.05 level. Hence, the above hypothesis is rejected. There is significant difference between the mean scientific aptitude scores of Tamil and English medium students is significant.

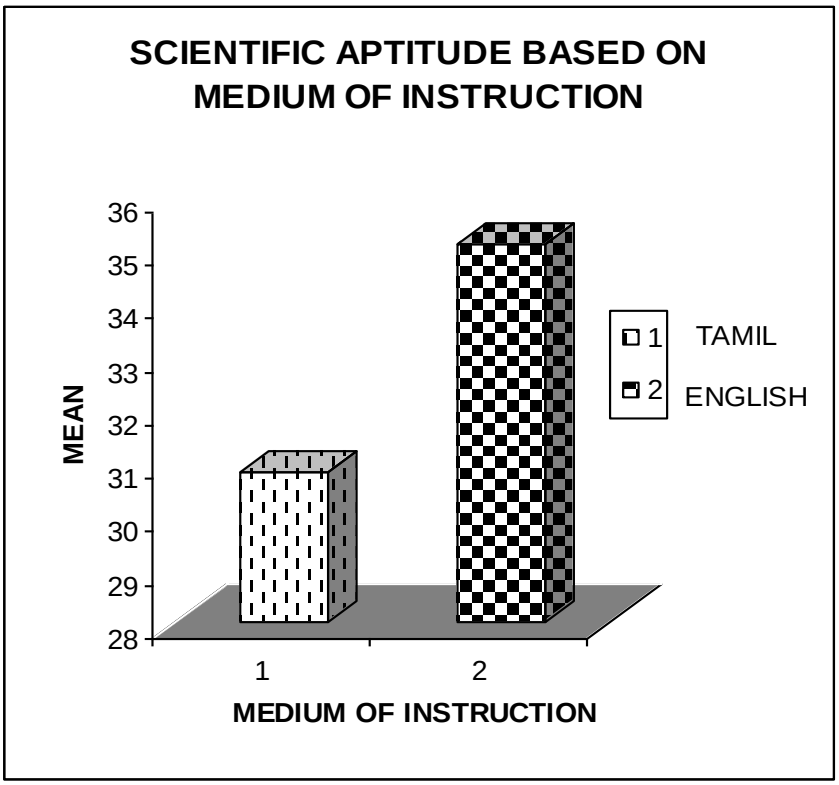


**FIG.3 SHOWING MEAN & S.D. VALUE OF SCIENTIFIC APTITUDE AMONG XI STANDARD STUDENTS BASED ON MEDIUM (TAMIL & ENGLISH).**

**Mean, S.D., and 't'- value of different type of schools:**

**Hypothesis 4:** There is no significant difference between the scientific aptitude of higher secondary students based on Type of school (Matriculation, Government and Government-aided).

**Table 4:** Significance of difference in scientific aptitude of XI standard students belonging to different type of schools.

| Sources of variation | df | Sum of squares(SS) | Mean Sum of squares(MSS) | f ratio | Table value |
|---|---|---|---|---|---|
| Between groups | 2 | 2278.996 | 1139.498 | 20.89 | 2.99 |
| Within groups | 385 | 20994.964 | 54.53 | | |
| Total | 387 | 23273.96 | | | |

From the above table, the calculated-ratio **20.89** is less than the table value of 2.99 at 0.05 levels. Hence, the above hypothesis is accepted. There is significant difference between the mean scientific aptitude scores of different types of schools.

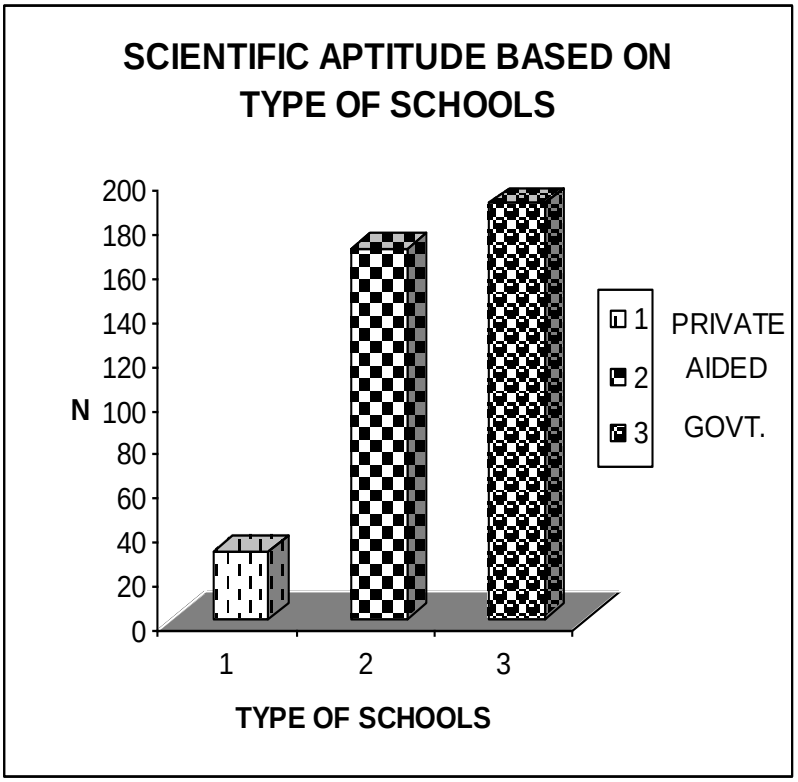


**FIG.4 SHOWING MEAN VALUES OF SCIENTIFIC APTITUDE AMONG XI STANDARD STUDENTS BASED ON DIFFERENT TYPES OF SCHOOL.**

**MAJOR FINDINGS AND CONCLUSIONS OF THE STUDY**

The Scientific aptitude of higher secondary students in Erode district is high. There is a significant difference in scientific aptitude among gender, locality, medium of instruction and type of schools. The investigator recommends conducting the study for higher level science students (for college students) for further research.

**REFERENCES**

Aggarwal, K.K.(1986), Manual for Scientific Aptitude Test Battery. Agra: National Psychological Corporation.

Best John W., (1982) Research in Education, 4th ed., New Delhi : Prentice Hall of India Pvt. Ltd.

Bhandula, N., P.C. Chandha, S. Sharma and M.P. Bhasin., (1985) Teaching of Science, Ludhiana: Prakash Brothers.

Bhaskara Rao, D. (1994). Scientific Aptitude, New Delhi: Ashish Publishing House.

Brown, S.B. and Brown, L.B. 1972. A semantic differential approach to the delineation of scientific values by professor of science and humanities; Journal of research in Science Teaching, 4, 345-351.

Das, R.C. Science Teaching in Schools. New Delhi: Sterling Publishers Pvt. Ltd., 1985.

Digumarti Bhaskara Rao (2004). Scientific attitude, Scientific aptitude and achievement, Discovery of Publishing House New Delhi -110 002, 77-80.

Dressel, (2004), Scientific Aptitude-vis-à-vis Scientific aptitude, Marlow Ediger and Rao D.B. page 41-42.

Ediger Marlow(2006), "Developing a Philosophy of Science Instruction", Experiments in Edcuation, June 2006, vol-34, no-6, page 5-8.

English, H.B. and A.C. English.(1958) A comprehensive Dictionary of Psychoanalytical Terms. London: Longmans.

Freeman, Franks. (1965) Theory and Practice of Psychological Testing, 3rd ed. Calcutta: Oxford & IBH Publishing Co.,

Garrett, Henry E. (1979). Statistics in Psychology and Education. Bombay: Peffer and Simons Pvt. Ltd.

Good C.V. (Ed.) (1973). Dictionary of Education, New York: McGraw Hill Publications.

Guilford, J.P. (1956) Psychometric Methods, New Delhi: McGraw-Hill Publishing Co. Ltd.

Gupta, Arun Kumar, (1985) "Differential Scientific Aptitude abilities and Scholastic Achievement". Indian Educational Review XX 151-157.

Heiss, Eldwood D., Ellsworth S. Obourn and Charles W. Hoffman (1950). Modern Science Teaching. New York: The MacMillan Co.

Hurd, P.H., (1954), "The Educational Concepts of the Secondary Science Teaching". School Science and Mathematics 89-96.

Jose. K.M (1987), A Comparative study of the Biology Achievement of High Average: And Low Science Aptitude of Secondary School pupils Unpublished Master of Education Thesis, University of Calicut, Calicut.

Kelly T.L., "Attitude Development" The International Encyclopedia of Education Research and Studies, page 346-352.

Kumar, U.S., (1991) In M.B. Buch(Ed), 5th Survey of Research in Education, New Delhi: National Council of Educational Training.

Nagappa P. Shahpur and Rao C.R.(2006) Manual for Scientific Aptitude Test(SAT) National psychological Corporation, Agra, page 2-19.

Nagappa P. Shahpur and Rao C.R.(2006) Manual for Scientific Aptitude Test(SAT) National psychological Corporation, Agra, page 2-19.

Nair, A.S. andJoseph.S.1978)An Experimental Study of the overlap of Intelligence and Science attitude with Educational outcomes in Biology measured using Host's Taxonomy. Department of education, University of Kerala, Trivandrum.

National Policy on Education, (1986) Department of Education, Ministry of Human Resource Development. Government of India, New Delhi, page 23.