International Journal of Advance Research in Science and Engineering
Volume No.07, Special Issue No.04, March 2018
www.ijarse.com
IJARSE
ISSN: 2319-8354

STUDY ON SCIENTIFIC TEMPER AMONG SECONDARY SCHOOL LEARNERS

Ridwana Mehraj

Research scholar, School of education
Central University of Kashmir, Nowgam (India)

ABSTRACT

Today is the age of science and technological development. Science has radically changed man's material and non material development. It has become an integral part of human life without which no individual can live comfortably. Scientifically literate individual makes informed decisions within the science and technological context by drawing their rich knowledge, such as understanding of concepts and principles, theories and processes of science. Science and technology, therefore has fostered a new intellectual temper known as scientific temper. After independence, it got conscious support through the first Prime Minister Pt. Jawaharlal Nehru, who emphasized on science and technology for cultural and economic growth of nation. In 1976, India became the first country to include in its constitution "Scientific Temper with Humanism" as a fundamental duty of all citizens of the country ***(Article 51-A (H)).*** *On 10th July 2015,* ***DR A. P.J Abdul Kalam Azad,*** *former President of India launched* ***'Rashtriya Avishkar Abhiyan (RAA)'*** *for developing scientific temper among school students. The main aim of this mission, which is under Ministry of Human Resource Development, is to develop curiosity, rationality, creativity and love for science and mathematics among school children. This research paper attempts to study the scientific temper of rural and urban secondary school students in district Budgam and Srinagar. The sample consists of 300 (150 rural and 150 urban) secondary school students, selected randomly. The data were collected by using N.A. Nadeem and Showkat Rashid Wani's Scale of scientific temper. The findings showed that there is significant difference between rural and urban secondary school students on various dimensions of scientific temper.*

Key words; scientific temper, Rural, and Urban Secondary school students.

I.INTRODUCTION

Education is the process, which helps in shaping and molding of human behavior in desirable way. Any modification brought about in the behavior of an individual, as a result of his interaction with the environment, constitutes learning. The history of the world proves that education has been the root cause for any change which takes place in the social, cultural, spiritual, political and economic aspects of human life. We can say that education is the process of learning and teaching the young the knowledge and skills necessary for adult life.

II.SECONDARY EDUCATION

Education which the student receives after the completion of elementary education is considered as 'Secondary Education'. It includes classes IX and X i-e ninth and tenth standard. The students in Class IX shall be called 'Primers' while those at class X shall be called 'sophomores'. Secondary education is considered as the most important phase , which is actually responsible for harmonious development- physical, mental, social and emotional development of an individual during adolescence period

III.OBJECTIVES OF SECONDARY EDUCATION

1. To make the students aware about the Rights and Duties as a citizens of nation.
2. To develop basic skills among the students in the field of information and communication technology (ICT).
3. Develop scientific knowledge as an integrated knowledge as well as understanding of various methods for identifying problems in different fields of knowledge.
4. To develop all aspects of personality of student-physically, mentally, emotionally and spiritually.
5. To develop logical mind among student through proper teaching of mathematics. Students should be able to solve their everyday problems logically.
6. Secondary school education should develop scientific temper among students. They should be able to enquire things and have courage to question.

Science education plays an important role in all round cultural and social development of human resources and helps in evolving a civilized society today. It enables an individual to think rationally and act resourcefully. Science and technology has given an important place in the Indian constitution. After independence, it got conscious support through the first Prime Minister Pt. Jawaharlal Nehru, who emphasized on science and technology for cultural and economic growth of nation. In 1976, India became the first country to include in its constitution "Scientific Temper with Humanism" as a fundamental duty of all citizens of the country **(Article 51-A (H)).** Science is the way of understanding the world, a perspective and a pattern of thinking that begins early in one's life. The role of science promises to be greater in the future because of the ever more rapid scientific progress. **Article 51 (A),** which deals with Fundamental Rights in our constitution makes it an obligation for every citizen of India to develop a scientific temper. Our first Prime Minister, **Pt. Jawaharlal Nehru** was very fond of using it. He emphasized on developing and fostering scientific temper among the Indian citizens so as to make them better citizens and competent of taking rational decisions and actions in a scientific manner. Scientific temper is not actually the knowledge of science and technology, theorems, principles or any scientific laws, but it is the critical thinking and evaluation.

Government of India enunciated a **New Science and Technology Policy in January (2003)**.The focus of this policy is to ensure that the message of science reaches to every citizen of India so that we advance in scientific temper, understand science and create a progressive and enlightened society, but, in India, scientific temper of science education has remained somewhat unexplored. Only negligible number of studies has been attempted in

this direction, many linked questions and issues remained unanswered while a lot of research studies need to be attempted to solve them. **National Science Day** is celebrated every year on 28th February in India, for spreading the importance of science in the life of people. In 2014, Govt. of India dedicated National Science Day to "Fostering Scientific Temper". The main aim was to make people aware about the need of scientific temper and how it changes the narrow attitude of people.

The **National Policy on Education NPE (1986)** has reiterated the significance of teaching of mathematics and science education as well as inculcation of scientific temper in the core curriculum in schools. The committee set up under the chairmanship of Prof. Yash Pal for implementation of programme for improvement of science education. The programme also emphasized the need for proper motivation among the teachers towards the inculcation of scientific temper. The uttermost need and importance of fostering scientific temper and scientific creativity among the students of our nation is stressed by our Honorable Prime Minister **Dr Manmohan Singh**, in the inaugural session of **92ND Indian Science Congress** "I sincerely hope your deliberations will contribute to the fostering of scientific temper among our people. Science is not merely an instrument of economic and technological progress; it is also a means to acquiring a more rational approach to life. The National Common Minimum Programme of our Government underlines the importance of integrating science with society and fostering scientific temper among the people so that we are able to deal with challenges at hand in a rational and reasonable manner.

IV.OBJECTIVES

1. To study the rural and urban secondary school students on various dimensions of scientific temper.
2. To compare rural and urban secondary school students on scientific temper.

Hypothesis

"There is no significant difference between rural and urban secondary school students on Scientific Temper".

V.METHODOLOGY

Operational Definition of Variable scientific temper:

For the purpose of present study, scientific temper has been operationally defined as the score which the investigator got by administering N.A Nadeem and Showkat Rashid Wani's scale of scientific temper.

Sample

The present study was conducted on a sample of 300 secondary school students (150 rural and 150 urban) selected randomly from ten secondary schools of district Budgam and Srinagar.

Tool

The scientific temper scale of Prof. N.A Nadeem and Showkat wani has been administered on the sample. The scale measures five dimensions of scientific temper—(i) Curiosity, (ii) Objectivity, (iii) Open-mindness (iv) Rationality (v) Aversion to superstition.

Statistical analysis and interpretation

The raw data was subjected to percentage, mean, S.D. and t-test for statistical treatment. The following table shows the statistical analysis of the data.

SECTION 'A'-DESCRIPTIVE ANALYSIS

Percentage computation of rural and urban secondary school students on Scientific temper.

Table 1.1: Showing the overall Percentage of Scientific Temper among Secondary School Students

Levels	**N**	**percentage**
High scientific Temper	148	49.3
Above Average Scientific Temper	113	37.7
Average Scientific Temper	36	12.0
Below average Scientific temper	3	1.0
Poor Scientific Temper	0	0.0
Total	**300**	**100.0**

The above table shows the overall levels of scientific temper among secondary school students. The results of the table depict that 49.3% secondary school students have high level of scientific temper, 37.7% secondary school students have above average level of scientific temper, 12.0% have average level of scientific temper, only 1.0% have below average level of scientific temper and none were having poor level of scientific temper.

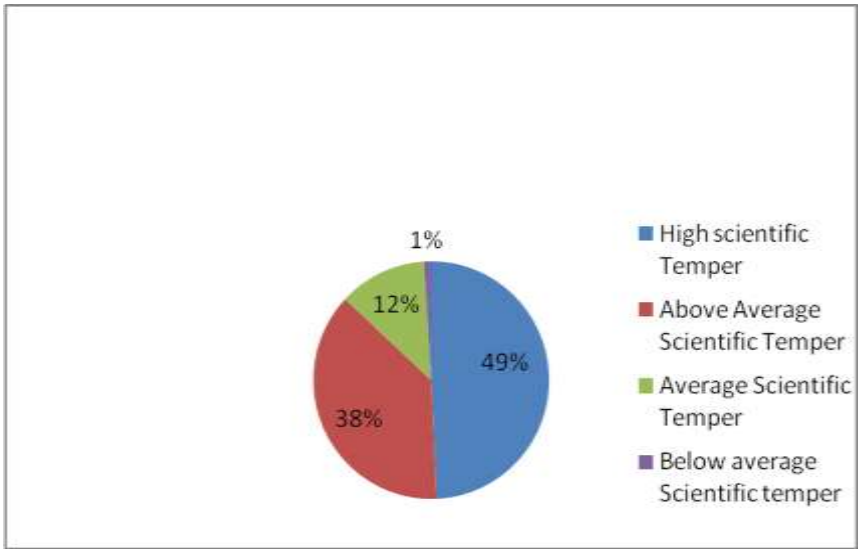

Fig. 1.1: Showing the overall Percentage of Scientific Temper among Secondary School Students.

Table1.2: Showing the percentage comparison between Rural and Urban Secondary School Students on levels of Scientific Temper

Levels	Rural Students		Urban Students	
	N	percentage	N	percentage
High Scientific Temper	113	75.3	35	23.3
Above Average Scientific Temper	34	22.7	79	52.7
Average Scientific Temper	3	2.0	33	22.0
Below Average Scientific temper	0	0.0	3	2.0
Poor Scientific Temper	0	0.0	0	0.0
Total	**150**	**100.0**	**150**	**100.0**

The above table shows the comparison between Rural and Urban Secondary School Students on levels of Scientific Temper. The table reveals that rural secondary school students show more level of 'High scientific temper' (75.3%) as compared to urban secondary school students (23.3%). It further depicts that about 52.7 percent of urban secondary school student shows 'Above average scientific temper' while 22.7 percent of rural secondary students fall at this level. Further, 22 percent of urban secondary students fall at 'Average scientific temper' while only 2 percent of rural student shows 'Average scientific temper'. In rural secondary school, none of the student shows 'Below average scientific temper' while in urban area, 2 percent of the secondary school student shows 'Below average scientific temper'.

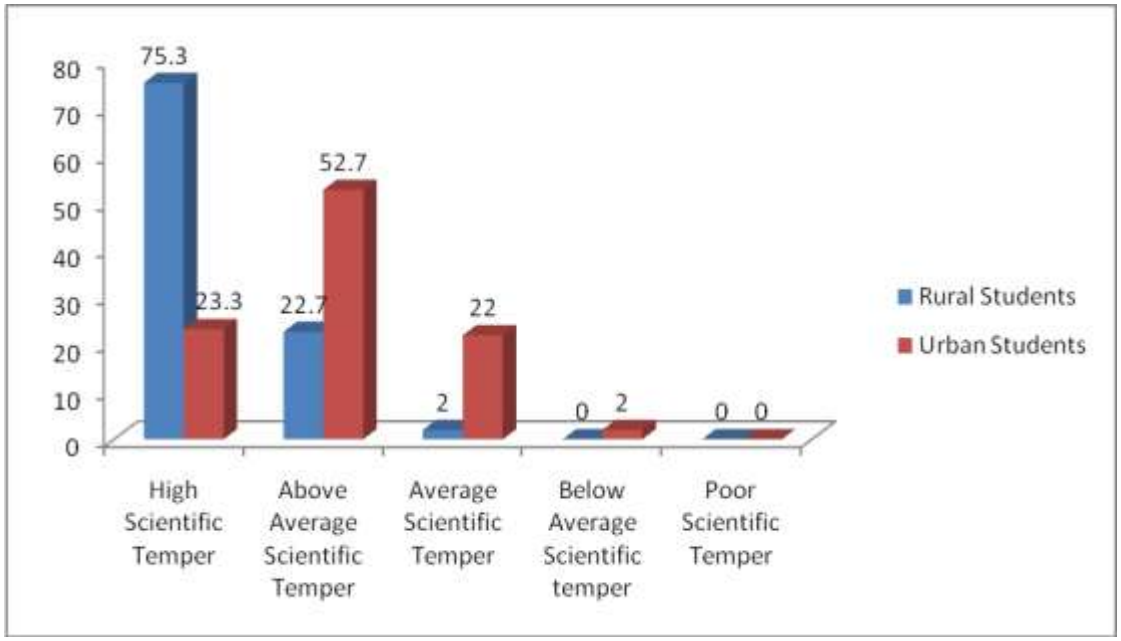

Fig. 1.2: Showing the percentage comparison between Rural and Urban Secondary School Students on levels of Scientific Temper.

SECTION 'B'-COMPARTIVE ANALYSIS

Comparative analysis of rural and urban secondary school students on various dimensions of scientific temper.

Table 1.3: Showing the mean comparison between Rural and Urban Secondary School Students on 'Curiosity' dimension of Scientific Temper (N=150 each)

Dimension	Group	Mean	Std. Deviation	t-value	Level of Significance
Curiosity	Rural	8.47	1.197	7.527	**
	Urban	7.10	1.874		

**=significant at 0.01

The above table shows the mean difference between Rural and Urban secondary school students on 'Curiosity' dimension of scientific temper scale. The table reveals that there is significant difference between rural and urban secondary school students on curiosity dimension. The calculated t-value 7.52 exceeds the tabulation value at 0.01 level of significance. This justifies that the difference between two groups is statistically

significant at 0.01level. Further the mean score of rural (8.47) secondary school students is decidedly better than the mean score of urban (7.10) secondary school students

Table 1.4: Showing mean difference between Rural and Urban Secondary School students on 'Open-mindness' dimension of Scientific temper (N=150 each).

Dimension	Group	Mean	Std. Deviation	t-value	Level of Significance
Open-mindness	Rural	7.37	1.582	7.816	**
	Urban	5.74	2.011		

**=significant at 0.01

The above table shows the mean difference between Rural and Urban secondary school students on 'Open-mindness' dimension of scientific temper. The table reveals that there is significant difference between the rural and urban secondary school students on open-mindness dimension of scientific temper. The calculated t-value of 7.81 exceeds the tabulation value at 0.01level of significance. Further, the mean score of rural (7.37) secondary school students is higher than the mean of urban(5.74) secondary school students.

Table 1.5: Showing mean difference between Rural and Urban Secondary School students on 'Objectivity' dimension of Scientific temper (N=150 each).

Dimension	Group	Mean	Std. Deviation	t-value	Level of Significance
Objectivity	Rural	8.96	1.092	8.320	**
	Urban	7.40	2.020		

**=significant at 0.01

The above table shows the mean difference between Rural and Urban secondary school students on 'Objectivity' dimension of scientific temper. The table reveals that there is significant difference between the rural and urban secondary school students on Objectivity dimension of scientific temper. The calculated t-value of 8.32 exceeds the tabulation value at 0.01level of significance. Further, the mean favours rural (8.96) secondary school student, which implies that rural students are more open to new things than urban secondary school students.

Table 1.6: Showing mean difference between Rural and Urban Secondary School students on 'Rationality' dimension of Scientific Temper (N=150 each).

Dimension	Group	Mean	Std. Deviation	t-value	Level of Significance
Rationality	Rural	8.05	1.387	10.514	**
	Urban	5.98	1.968		

**=significant at 0.01

The above table reveals that there is significant difference between Rural and Urban secondary school students on 'Rationality' dimension of scientific temper scale. The calculated t-value of 10.51 exceeds the tabulation value at 0.01level of significance. This justifies that the difference between the two groups (Rural& Urban) is statistically significant at 0.01. The mean of rural (8.05) secondary school students is decidedly more than urban (5.98) secondary school students, which indicates that rural students are more rational, reasonable, and highbrowed than urban.

Table 1.7: Showing mean difference between Rural and Urban Secondary School students on 'Aversion to Superstition' dimension of Scientific temper (N=150 each).

Dimension	Group	Mean	Std. Deviation	t-value	Level of Significance
Aversion to superstition	Rural	5.39	1.634	5.272	**
	Urban	4.31	1.904		

**=significant at 0.01

The above table shows the mean difference between Rural and Urban secondary school students on 'Aversion to superstition' dimension of scientific temper. The table reveals that there is significant difference between the rural and urban secondary school students on this dimension of scientific temper at 0.01level. Further, the mean score favours the rural (5.39) secondary school students, which implies that rural secondary school students do not follow any belief blindly

Table 1.8: Showing mean difference between Rural and Urban Secondary School students on 'Overall dimensions' of Scientific temper (N=150 each).

Dimension	Group	Mean	Std. Deviation	t-value	Level of Significance
Scientific temper	Rural	38.24	4.267	11.233	**
	Urban	30.53	7.239		

**=significant at 0.01

The above table reveals that rural and urban secondary school students differ significantly on composite score of scientific temper scale. The calculated t-value of 11.23 exceeds the tabulation value at 0.01level of significance. This justifies that the difference is statistically significant at 0.01. Further, the mean of rural(38.24) secondary school students is better than the mean score of urban (30.53), which indicates that rural secondary school students displayed better scientific temper than urban secondary school students. So the hypothesis no.2, which is stated as "there is no significant difference between rural and urban secondary school students on scientific temper", stands rejected.

VI.DISSCUSSION

The two groups, rural and urban secondary school students, were compared on various dimensions of scientific temper. The findings of the study shows that among secondary school students(rural and urban), about 49.3% fall in High scientific temper, 37.7% fall in Above average scientific temper, 12.0% fall in Average scientific temper and only 1.0% fall in Below average scientific temper. Further it has been found that in case of rural secondary school students, 75.3% fall in High scientific temper, 22.7% fall in above average scientific temper, 2.0% fall in Average scientific temper and none of the students were found to have Below average and Poor scientific temper. While in case of urban secondary school students, 23.3% fall in High scientific temper, 52.7% fall in Above average scientific temper, 22.0% fall in Average scientific temper and 2.0% of the students found to have Below average scientific temper. None of the students fall in Poor scientific temper. The same results were found by **Nadeem N.A and Sabahat (2015)** in their study, where they found 0% of rural and urban secondary school students fall in Below average and Poor scientific temper.

Findings revealed that there is significant difference between rural and urban secondary school students on curiosity. Rural students are found to be more curious to learn new things and are always ready to go for any adventure trips. Further, the findings depicted that rural and urban secondary school students differ significantly on open-mindness, objectivity, and rationality dimension of scientific temper. Findings shown that rural secondary school students are open to new things. They do not reject any knowledge which conflict with their own idea. Their mind is free from any prejudice and is unbiased. Rural students are inclined to interpret the data prior to the actual observations and experimentation that was made as well as verifies the observation's consistency.

This study shows that rural secondary school students are high on 'aversion to superstition' dimension of scientific temper than their counterparts. They reject the false beliefs and accept scientific facts and explanations. Research conducted by **Nadeem N.A & Sabahat (2015)** supported this finding, in which they found that rural students to be more averted to superstition than urban secondary school students.

When both the groups, rural and urban secondary school students, were compared on overall dimension of scientific temper, both the groups found to be significantly different at 0.01 level. Rural students are found to be high on scientific temper. There is no such study, which supports this finding. The reason for this result could be the more exposure to new technologies like they are now connected to the world through internet. They understand the things in real sense.

The findings of **Aezum A.T & Wani N.A(2013), Sekar P& Mani S(2013), Naseerali M.K(2013)** and **Bhatnagar R.D(2014),** agreed with the present findings that there is significant difference between rural and urban secondary school students on scientific temper.

VII.CONCLUSION

Some of the conclusions drawn from the analysis of data are given below:

1) Among secondary school students(rural and urban) ,about 49.3% fall in High scientific temper, 37.7% fall in Above average scientific temper, 12.0% fall in Average scientific temper and only 1.0% fall in Below average scientific temper.
2) Among rural secondary school students, 75.3% fall in High scientific temper, 22.7% fall in Above average scientific temper, 2.0% fall in Average scientific temper and none of the students were fall in Below average and Poor scientific temper. In case of urban secondary school students, 23.3% fall in High scientific temper, 52.7% fall in Above average scientific temper, 22.0% fall in Average scientific temper while 2.0% of the students fall in Below average scientific temper. None of the students fall in Poor scientific temper.
3) Rural and urban secondary school students differ significantly on curiosity dimension of scientific temper.
4) Rural and urban secondary school students differ significantly on open-mindness, objectivity and rationality dimension of scientific temper. Rural secondary school students are open towards new things.
5) Rural students are high on aversion to superstition dimension of scientific temper than urban secondary school students.
6) Rural and urban secondary school students differ significantly on composite score of scientific temper.

REFERENCES

[1.] Aasia Maqbool & Akbar Sofi (2013). Scientific Temper and Academic Achievement of Science and Social Science Stream Adolescents, *Elite Research Journal of Education and Review Vol. 1(5) pp. 44 -47.*

[2.] Aezum, A.T & Wani, N.A (2013).Comparative Evaluation of scientific temper & academic achievement among Adolescents, *International Journal Of Innovative Research & Development, vol:2, Issue 8.*

[3.] Andrabi , Azad Ahmad (2015). A comparative study of scientific temper among tribal and non tribal adolescents of Kashmir, *An International Peer Reviewed And Referred Scholarly Research Journal For Interdisciplinary Studies.*

[4.] Ishfaq and Ridwana (2016). Scientific temper and creativity among higher secondary school students, *An International Journal of Multidisciplinary Research, vol:2,issue 1.*

[5.] Nadeem N.A. & Sabahat (2015).*Scientific temper, Career preferences and Academic achievement of rural and urban secondary school students*, Department of Education, University of Kashmir, (Unpublished).

[6.] Naseerali M.K (2013).scientific attitude of secondary school students in Maharashtra, *Conflux Journal Of Education, vol: 1, Issue: 2.*

[7.] National Policy on Education (1986): New Delhi, Ministry of Human Resource Development, Government of India.

[8.] P. Sekar & S. Mani(2013).Science attitude of Higher Secondary Students in District Thiruvannamalai, *Indian Journal Of Research, Vol:2, Issue:11.*