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SCIENTIFIC TEMPER AMONG SECONDARY SCHOOL STUDENTS - A COMPARATIVE STUDY

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Abstract

This study compared the scientific temper of 50 male and 50 female secondary school students in Budgam district using a scale measuring curiosity, open-mindedness, objectivity, rationality, and aversion to superstition. The results indicated similar levels of curiosity and open-mindedness between genders, with both showing a desire to understand new situations and revise opinions based on evidence. However, female students displayed better objectivity in observing and recording facts without influence, greater rationality in identifying cause-and-effect relationships, and a stronger aversion to superstitious beliefs compared to their male counterparts. Overall, the female students exhibited a more pronounced scientific temper across the measured dimensions.

Keywords: Scientific temper, secondary school Students, Kashmir.

INTRODUCTION

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.

Scientific advances over the last fifty years have led to revolutionary changes in health, nutrition and communication and generally enhancing socio-economic development and the quality of ourlives. The role of science promises to be greater in the future because of the ever more rapid scientific progress. Our society is becoming dependent on science and technology. A mind that is curious to understand 'whys' and 'how's' of life while accepting that all questions may not be fully answerable. The concept of scientific temper was articulated first by pandit Jawaharlal Nehru in 1946 in his book 'Discovery of India' referring to it as a way of life, a process of thinking, a method of acting and associating with our fellowmen. Nehru was instrumental in laying the foundations for building the infrastructure for science and

technology in India- the universities, the IITs, the CSIR labs, etc. these became the hardware of science and technology in India , while scientific temper among the people of India was to be the software. 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)). Ramachandran (2020) rightly pointed out that scientific temper and outlook are essential for solving problems related to resources, energy and natural disasters in our country. Fostering scientific temper will help in dealing with several social issues objectively and with open mindedness (Sharma, Akther, & Mir, 2019). Thus it is necessary to give due importance to the discussion on scientific temper in the context of developing India.

Significance of the Study

This study holds significant importance in understanding the current state of scientific temper among secondary school students in private and government-run institutions. A scientific temper is a crucial mindset that promotes rational thinking, questioning, and a willingness to revise beliefs based on empirical evidence. Fostering a scientific temper from an early age is vital for nurturing a generation capable of critical thinking, problem-solving, and contributing to scientific and technological advancements.

By comparing the scientific temper of students from private and government schools, this research aims to identify potential discrepancies or similarities in the promotion of scientific attitudes across different educational settings. The findings could provide valuable insights for policymakers, educators, and curriculum developers to address any gaps and tailor educational strategies to promote a stronger scientific temper among students, regardless of their school type.

Furthermore, the study can shed light on the factors influencing the development of a scientific temper, such as teaching methodologies, exposure to scientific activities, availability of resources, and the overall educational environment. This understanding can guide the implementation of effective interventions and reforms to enhance science education and cultivate a culture of scientific inquiry across all educational institutions.

Ultimately, fostering a scientific temper in young minds is crucial for driving innovation, addressing societal challenges, and promoting evidence-based decision-making. This study contributes to the larger goal of producing scientifically literate and critically thinking individuals who can positively impact their communities and shape a more rational and progressive society.

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OBJECTIVES OF THE STUDY

Following objectives were formulated for the purpose of present study:-

1. To study the scientific temper of male and female secondary school students in district Budgam.
2. To compare male and female secondary school students on scientific temper.

HYPOTHESES

1. Male and female secondary school students differ significantly on scientific temper.

OPERATIONAL DEFINITION OF TERMS AND VARIABLES

a) Scientific Temper: For the purpose of present study, scientific temper has been operationally defined a the score which the investigator got by administering Nadeem's and Showkat's Scientific Temper Scale.

SAMPLE

The sample for the study consisted 100 students (50 male students and 50 female students) of District Budgam. The sample were selected randomly from different secondary schools of district Budgam.

The breakup of the sample was as under:

Group	N	Total
Male	50	100
Female	50	

Tools Used and Description of the Tool:

The data for the present study was collected with the help of scale constructed by Prof. Nadeem and Showkat Rashid Wani which assesses five dimensions of scientific temper i.e. curiosity, open mindedness, objectivity, Rationality and Aversion to Superstitions.

STATISTICAL ANALYSIS

The data collected was subjected to the following statistical treatment;

Percentage statistics

Mean

S.D.

t- test

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ANALYSIS AND INTERPRETATION

Table 1: Significance of the mean difference between male and female secondary school students on "Curiosity" dimension of Scientific Temper

Group	Mean	S.D	t-value	Significance
Male students	5.96	1.61	0.54	Not Significant
Female students	6.14	1.47		

The above table shows the mean difference between male and female secondary school students on Curiosity dimension of Scientific Temper Scale. The above table reveals that there is no significant difference between male and female secondary school students, which indicate that the both groups displayed somewhat similar curiosity, though the mean difference favoured female students but the difference failed to arrive at any level of confidence.

Table 2: Significance of the Mean difference between male and female secondary school students on "Open Mindedness" dimension of Scientific Temper.

Group	Mean	S.D	t-value	Significance
Male students	6.01	1.68	1.69	Not Significant
Female students	7.04	1.41		

The above table reveals that there are no significant mean differences between male and female secondary school students on open mindedness, dimension of Scientific Temper. The table shows that female students have high mean score as compared to the mean score of male students but the difference failed to arrive at any level of confidence.

Table 3: Significance of the mean difference between male and female secondary school students on "objectivity" dimension of Scientific Temper

Group	Mean	S.D	t-value	Significance
Male students	5.25	1.28	2.17	Significant at 0.05 level
Female students	6.41	1.26		

The above table shows the mean difference between male and female secondary school students on objectivity dimension of scientific temper scale. The table reveals that there is significant between male and female secondary school students on scientific temper. The calculated t-value of 2.17 exceeds the t-value at 0.05 level of significance. This justifies that the

difference between two groups is statistically significant at 0.05. The mean of female students (6.41) is decidedly better than the mean of first generation learners. (5.25).

Table 4: Significance of the mean difference between male and female secondary school students on "Rationality" dimension of Scientific Temper.

Group	Mean	S.D	t-value	Significance
Male students	5.47	1.36	2.87	Significant at 0.01 level
Female students	6.22	1.30		

The above table shows that the mean difference between the male and female secondary school students on Rationality dimension of Scientific Temper Scale. The calculated t-value of 2.87 exceeds the t-value at 0.01 level of significance. This justifies that the difference between two groups is statistically significant at 0.01 level. The mean score of female students (6.22) is decidedly better than the mean of male students (5.47). This indicated that the female students displayed rationality dimension more than their counterpart.

Table 5: Significance of the mean difference between male and female secondary school students on "Aversion to Superstition" dimension of Scientific Temper

Group	Mean	S.D	t-value	Significance
Male students	4.21	1.80	3.96	Significant at 0.01 level
Female students	4.87	1. 92		

The above table shows that the mean difference between the male and female secondary school students on Aversion dimension of Scientific Temper Scale. The calculated t-value of 3.96 exceeds the t-value at 0.01 level of significance. This justifies that the difference between two groups is statistically significant at 0.01 level. The mean score of female students (4.87) is decidedly better than the mean of male students (4.21). This indicated that the female students displayed aversion dimension more than their counterpart.

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Table 6: Showing mean significance difference (Overall dimensions) of scientific temper between male and female secondary school students (composite score).

Group	Mean	S.D	t-value	Significance
Male students	30.26	4.69	4.32	Significant at 0.01 level
Female students	34.45	5.21		

The above table shows that the mean difference between the male and female secondary school students on composite score of Scientific Temper Scale. The calculated t-value of 4.32 exceeds the t-value at 0.01 level of significance. This justifies that the difference between two groups is statistically significant at 0.01 level. The mean score of female students (34.45) is decidedly better than the mean of male students (30.26). This indicated that the female students displayed better scientific temper than their counterparts.

CONCLUSION

On the basis of the data analysis the following conclusions have been drawn out from the present study:

- It has found that both the groups displayed somewhat similar type of curiosity while measuring on scientific temper scale. Both the groups of male students and female students showed desire for understanding new situation.
- It was further found that both male students and female students showed same type of open mindedness while measuring on scientific temper scale. Both male students and female students showed willingness to revise opinions and conclusions in the light of new evidences and facts.
- It has also been found that female students showed better objectivity than first generation learners. Both the groups have ability to observing and recording facts without any influence.
- It has been found that female students showed more rationality than their counter parts while measuring on scientific tramper scale. Both male students and female students have taste for the identification of cause and effect relationship.
- It was further found that while comparing male students and female students on scientific temper, female students showed better aversion to superstition dimension of scientific temper. Both the groups have ability to rejection of false beliefs.
- It has been found that female students displayed better scientific temper than their counterparts.

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EDUCATIONAL IMPLICATIONS

- It is well known that our modem societies have come to depend more on scientific and technical advances than earlier times. The interest in basic sciences is diminishing at all levels in developed as well as developing countries. There is a paradigm shift in the thinking of an average person towards scientific research which needs collective attention. The science policy makers, scientific managers, have to devise innovative methods which can creates scientific temper among the younger generation and attract talents to take up science and scientific research as a career.
- The scientific spending in India is very small. We must realize that the scientific manpower is precious asset. Scientists must be given opportunities, responsibilities for the scientific and technological developments in the country and introduce methods by which the brain-drain can be stopped and reversed. Even the existing the scientific manpower in the country should be better utilized by providing attractive incentives.
- Studying the scientific lives of successful scientists and highlighting their achievements will certainly have a lasting impression on the minds of the younger generation. Such studies may help in motivating the younger generation and scientists towards higher productivity and creativity to make the nation strong and self-reliant.

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