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SCIENTIFIC TEMPER OF URBAN AND RURAL ADOLESCENTS OF UT LADAKH.

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ABSTRACT

Scientific temper the disposition to think logically, question sensibly, and seek evidence is highlighted in India's National Education Policy 2020 as a core twenty-first-century competency. This study explored scientific temper among adolescents in Ladakh, contrasting rural and urban settings. A purposive sample of 100 students (50 urban, 50 rural) was assessed with the Scientific Temper Scale (STS-2010). Descriptive statistics (percentages, means, standard deviations) and an independent samples t-test were used for analysis. The results revealed that on levels of scientific temper both Rural and Urban adolescents differ significantly. Further, when comparing urban and rural somewhat displayed similar results. Nevertheless, overall composite mean scores for urban adolescents was 34.16 and 30.44 for rural adolescents, t- value is 0.00 which was not significant at level of 0.01 or 0.05, despite insignificant results overall mean scores favours the urban adolescents on scientific temper.

KEYWORDS: Scientific Temper, Urban Adolescents, Rural Adolescents, Ladakh.

INTRODUCTION:

The National Education Policy 2020 visualizes an education system that shapes individuals into not just knowledgeable, but truly good human beings those who can think rationally and act wisely. It emphasizes nurturing qualities such as courage, compassion, empathy, resilience, creative imagination and scientific temper, all rooted in strong ethical values. The ultimate goal is to cultivate engaged and productive citizens who actively contribute to building a just, inclusive, and diverse society, in line with the ideals of our Constitution. The policy in its recommendation vividly mentioned that specific capacities and skills, such as scientific temper,

fitness and wellness, creativity, communication, teamwork, digital literacy, problem-solving, ethics, and so on, will be emphasized in school (National Education Policy, 2020).

The term "scientific temper" was introduced first in India by Pandit Jawaharlal Nehru in 1946. Post becoming the first PM of independent India in 1947, Nehru passionately championed the idea, consistently promoting it as a vital national value. He worked tirelessly to inspire both political and scientific communities to foster a spirit of inquiry, rational thinking, and a scientific outlook among the people of India (Mahanti, 2013). A person's ideals, worldview, and method of viewing their own universe of actions and deeds are all considered to be part of their scientific temperament. According to humanism, scientific temper is both a value and a means of realizing human rights, making it the only ideal worth striving for in difficult situations at all scales, from the local to the global. According to the National Curriculum Framework (NCF) 2005, which is now considered the holy book of educational institutions, sciences, like mathematical frameworks, have their own distinct ideas that are often connected through theories and hypotheses and are attempts to represent and explain the natural world. Accepting hypotheses or ideas supported by experiments and controls requires scientific study, which involves observation and experiment. The "Showing of Science" National Focus Groups recommend that measures be taken to optimize experiment-based learning in science subjects.

Narlikar 2003 opined, "We are living in a free India that is gradually moving towards financial success. However, Nehru believed that a scientific outlook was crucial for our future well-being, and we're still a long way from reaching it". Bhargava and Chakrabarti 2010, the deficient of scientific temper would be one of the top three or four reasons for the nation's failure or backwardness in many domains. Despite a notable advancement in science and technology, Mohanti (2013) states that Nehru's vision of the country becoming a scientific temper has remained mostly unfulfilled.

In today's world, where knowledge is immensely multiplying, science education will be unable to justify itself by focusing solely on the goal of conveying a specific quantum of scientific information, however vast that quantum may be, because science information is rapidly becoming obsolete, it is critical that the focus of science education be first on the development of abilities and mental dispositions rather than solely the transmission of dead subject matter. The problem of establishing a scientific temper in the educand should be promptly addressed through

research in science education. The scientific temperament and mindset are, or ought to be, a way of thinking, doing, and relating to our peers. A P J Abdul Kalam stresses the value of bringing the beauty of science into the classroom and promotes the questioning of scientific thinkers to foster a scientific mindset.

According to Article 51A of our constitution, it is the duty of every citizen to develop a scientific temperament. Our constitution's Article 51A further states that it is the duty of every citizen to advance humanism and a culture of inquiry and reform. Our scientific approach repeats the same considerations. The government and a few non-governmental organisations are launching a number of initiatives to help pupils develop a scientific attitude.

With a strong scientific and technical foundation, we have now reached the 21st century. Human civilization underwent major upheavals during the twentieth century. Following the agricultural revolutions, which enabled humans to become self-sufficient in food, came the Industrial revolution. We are now on the verge of an information technology revolution. But science knowledge, which is so important for everyone in the current world, has been at the heart of it all. The pursuit of truth and new knowledge, the inability to accept anything without trial and error, the ability to change prior conclusions in light of new information, the dependence on observed facts rather than preconceived theories, and mental discipline are all qualities necessary for both scientific and human application to life and its challenges.

OBJECTIVES OF THE STUDY:

The objectives of the present study are framed as under:-

1. To study the scientific temper of urban and rural adolescents on the following areas of scientific temper.
   a) Curiosity
   b) Open Mindedness
   c) Objectivity
   d) Rationality
   e) Aversion to Superstitions.
2. To compare the scientific temper of urban and rural adolescents on the following areas of scientific temper.
   a) Curiosity

b) Open Mindedness
c) Objectivity
d) Rationality
e) Aversion to Superstitions
f) Overall Scientific temper.

HYPOTHESES

1. There is significant difference between urban and rural adolescents on levels of scientific temper.
2. There is significant difference between urban and rural adolescents on Curiosity, Open Mindedness, Objectivity, Rationality, and Aversion to Superstitions dimensions of scientific temper.
3. There is significant difference between urban and rural adolescents on Overall dimensions of scientific temper.

SAMPLE

The research study was conducted on a carefully selected sample of 100 adolescents residing in both urban and rural areas of Leh, located in the Union Territory of Ladakh. The objective was to ensure a balanced representation from both demographic segments to facilitate meaningful comparisons and insights. The sample was equally divided between the two groups, as detailed below in table 1.1

Table 1.1: Sample of the Study

Group	N	Total
Urban adolescent	50	100
Rural adolescent	50	

RESEARCH TOOL

The data for the present study was collected with the help of Scientific temper scale (STS-2010) developed by "Prof. Nadeem and Showkat Rashid Wani" which assesses the 5 dimensions of scientific temper i.e. "Curiosity, Open mindedness, Objectivity, Rationality and Aversion to Superstitions". To interpret the results meaningfully, the obtained scores on the Scientific Temper Scale were classified into distinct categories based on defined score ranges. These

categories reflect varying levels of scientific temper among adolescents and help in understanding their inclination towards logical thinking, inquiry, and evidence-based reasoning. The norms and scoring of the Scientific temper scale (STS-2010) in given in table 1.2

Table 1.2: Norms and Scoring

Range of Scores	Classification
40 & above	"High Scientific Temper"
30-39	"Above Average Scientific Temper"
20-29	"Average Scientific Temper"
10-19	"Below Average Scientific Temper"
0-9	"Poor Scientific Temper"

DELIMITATION

The present research was delimited to urban and rural adolescents of Leh UT Ladakh.

DATA ANALYSIS AND INTERPRETATION:

Objective 1: Percentage-Level Distribution of Urban and Rural Adolescents Based on Levels of Scientific Temper

The present study aimed to explore the distribution of scientific temper among adolescents belonging to urban and rural areas of Leh, UT Ladakh. The Scientific Temper Scale scores were categorized into five distinct levels: High, Above Average, Average, Below Average, and Poor. The percentage distribution and corresponding frequencies for each group are presented in the table 1.3.

With regard to percentages distribution, table reveals that 20% of urban adolescents' responses and 2% rural adolescents' responses fall under high scientific temper. Further, 60% of urban adolescents and 50% of rural adolescents' responses fall under above average scientific temper. Additionally, 20% of urban adolescents and 48% of rural adolescents' responses fall under average scientific temper. None of urban and rural adolescents' responses fall under below average scientific temper and poor scientific temper. Outcomes confirm that there exist some differences for urban and rural adolescents with regard to percentage distributions of scientific

temper. Hence, the hypothesis which states that there is a significant difference between urban and rural adolescents on levels of scientific temper stands retained.

Table 1.3: Percentage level distribution of Urban and Rural adolescents

Scientific Temper					
Levels	**Range**	**Urban**	**N**	**Rural**	**N**
"High Scientific Temper"	40 & above	20%	10	2%	1
"Above Average Scientific Temper"	30-39	60%	30	50%	25
"Average Scientific Temper"	20-29	20%	10	48%	24
"Below Average Scientific Temper"	10-19	0	0	0	0
"Poor Scientific Temper"	0-9	0	0	0	0

Objective 2: To compare the scientific temper of urban and rural adolescents on Curiosity, Open Mindedness, Objectivity, Rationality, and Aversion to Superstitions.

To gain deeper insights into the scientific temper of adolescents, the study aimed to compare urban and rural students across five core dimensions of scientific temper Curiosity, Open-Mindedness, Objectivity, Rationality, and Aversion to Superstitions. Each of these traits reflects a crucial component of a scientific mindset, and their comparison sheds light on the nuanced differences in thinking patterns and attitudes among adolescents from distinct socio-geographical backgrounds.

The mean scores, standard deviations (SD), and t-values for each dimension are presented below:

Scientific Temper					
Dimensions	**Urban**		**Rural**		
	$\bar{X}$	**SD**	**$\bar{X}$**	**SD**	**t-value**
Curiosity	7.42	1.485	6.2	1.969	0.00
Open-Mindedness	6.92	1.736	6.14	1.293	0.01
Objectivity	7.88	1.573	6.26	1.946	1.44
Rationality	6.92	1.736	6.42	1.773	0.15
Aversion to Superstitions	5.02	2.245	5.42	1.386	0.28

Above table depicts that on dimension of curiosity for urban and rural adolescents t-value is 0.00, for open-mindedness t- value is 0.01, for objectivity t-value is 1.44, for rationality t-value is 0.15 and for aversion to superstitions for both urban and rural adolescents' t-value is 0.28. Table moreover reveals that there exists no significant difference between urban and rural adolescents on dimensions of scientific temper. So the hypothesis there is significant difference between urban and rural adolescents on Curiosity, Open Mindedness, Objectivity, Rationality, and Aversion to Superstitions dimensions of scientific temper stands rejected.

1. To compare the scientific temper of urban and rural adolescents on overall score of Scientific Temper.

Scientific Temper					
Overall dimensions	Urban		Rural		
	$\bar{X}$	SD	$\bar{X}$	SD	t-value
Composite scores	34.16	5.75	30.44	4.953	0.00

Table reveals that on composite scores for urban and rural adolescents t- value is 0.00, which is not significant at 0.01 or 0.05 level of significance. Henceforth, hypothesis which states that there is significant difference between urban and rural adolescents on overall scores stands rejected.

DISCUSSION

Scientific temper refers to an attitude of logical thinking, reasoning, and a willingness to question and explore the world with curiosity and evidence. Among adolescents, the development of scientific temper is crucial as it shapes their outlook towards education, society, and problem-solving in daily life. In the context of UT Ladakh, with its unique geographical, cultural, and educational environment, studying the scientific temper of urban and rural adolescents becomes particularly important. Such a study can help us understand how differences in access to resources, exposure, and socio-cultural influences impact young minds in building rational and scientific attitudes. The percentage level distribution of Urban and Rural adolescents based on levels of Scientific Temper was analyzed. It was revealed that 20% of urban adolescents' responses and 2% rural adolescents' responses fall under high scientific temper. Further, 60% of urban adolescents and 50% of rural adolescents' responses fall under above average scientific temper. Additionally, 20% of urban adolescents and 48% of rural adolescents' responses fall under average scientific temper. None of urban and rural adolescents' responses fall under below average scientific temper and poor scientific temper. Results confirm that there exist some differences for urban and rural adolescents with regard to percentage distributions of scientific temper. The study aimed to compare urban and rural students across five core dimensions of scientific temper and it was revealed that there exists no significant difference between urban and rural adolescents on dimensions of scientific temper. The finding is supported by Ramaraj et at., (2018).

CONCLUSIONS:

Based on the analysis and interpretation of data, it was discovered that teenagers living in urban and rural areas enjoy discussing topics with their peers, watching shows on Discovery Channel, National Geographic Channel, Animal Planet, and radio, and taking educational tours and field trips where they can observe nature. They also show an interest in going to science fairs, science exhibitions, and science clubs. Furthermore, teenagers claimed that using information and communication technology is essential to expanding one's horizons mentally and that constructive criticism advances understanding. They also advocated dialogue, discussion and other interactive methodology should be encouraged in their schools. Teenagers believed that in order to be objective, they needed critically examine the what, how, and why questions and get to their conclusions by observation, experimentation, discussion, consultation, and reasoning. Teenagers from both urban and rural areas stated that in order to spark public interest in science, scientific-related articles have to be published in newspapers, journals, and magazines. In science, evaluation needs to be thorough and ongoing. Adolescents who subscribed to rationality held that ideas shouldn't be accepted at face value and that instead, one should be directed by logic and reason rather than emotions. Instead, tests for empirical verification ought to be conducted. Moreover, Adolescents think that the secret to success is perseverance, hard effort, and a sincere goal. Teenagers in urban and rural areas who are anti-superstitions do not consider that natural disasters like storms and earthquakes are the result of divine wrath, nor do they accept the notion that terrible omens, such as the need to cancel a trip if a cat crosses the route or someone sneezes, are real. Nonetheless, teenagers from rural areas think that life is mostly dependent on luck.

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