

A Comparative Study of School Going Rural and Urban Adolescents in Relation to their Scientific Attitude

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ABSTRACT

Modern era is an era of science. This is an age where the society is completely drawn in to the scientific environment and the science has become an integral part of living. Science has brought about revolutionary changes in every walk of life. Unlike other subjects, science doesn't simply pray for things to happen; rather it seeks to find out why things happen. The difference between modern world and ancient world is due to science. Now we are living in an age of scientific culture. Now one of the chief objectives of education is the development of desirable scientific attitude in the students. The aim of the study was to study the correlation between scientific attitude and location of the school going adolescents. The sample of the research was consisted of 200 class 10th students of different rural and urban schools of district Shamli (Uttar Pradesh). As a result of the research, it was determined that scientific attitude was dependent on the location of the adolescent i.e. rural or urban. The urban adolescents were found to have better scientific attitude than rural adolescents.

Keywords: *Scientific Attitude, Adolescent, Rural, Urban*

Science has wrested from the nature all the treasures hidden on earth which has made life as we know it today. The impact of science is visible everywhere. It influences every aspect of our life whether it is cultural, social, psychological or vocational. Science trains the mind of people, creates good habits and develops awareness in them about their environment as every event happening around us demands some knowledge of simple scientific facts or principles. Without this knowledge we will be at loss. Learning of scientific principles provides training in scientific method and develops empirical outlook and scientific temperament of the learner. Teaching of science in school not only gives students adequate scientific knowledge and requisite skills to solve their daily life obstacles but also trains them in proper scientific methods enabling them to delve in proper investigation of problems thereby developing a fervent scientific attitude in them. Development of scientific attitude is the most important outcome of teaching science in schools. Some people view the development of scientific attitude in students as the by-product of teaching science, yet a large number of people consider it as equally important for general epistemological reasons. Scientific attitude is linked with "an ardent curiosity, fertile imagination and tone of experimental inquiry". Using controlled methods; scientists collect data in the form of observation, record the observable

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physical evidence of natural phenomenon and analyze this information to construe theoretical explanation.

The report on policies for science education reveals

Science is cumulative and endless series of empirical observations which results in the formations of concepts and theories with both concepts and theories being subject to modification in the light of future empirical observations. Science is both a baby of knowledge and the process of acquiring and refining knowledge.

The Two Faces of Science

Science is a systematic enterprise aimed at constructing and organizing rational knowledge about the natural and human environment. Science is categorized into scientific disciplines, which are each defined as the study of a specific type of phenomena. Each scientific discipline has two faces. An intellectual face, which corresponds to an interest in understanding a specific type of phenomena, and an instrumental face, which corresponds to an interest in using such an understanding in order to predict and/or effect (or manipulate) the environment. These two “faces of science” are intimately related. It is widely accepted that the test of good understanding is its predictive power (which refers to predicting the normal course of the evolution of the environment or its evolution under planned intervention). The other direction is even more obvious: Non-trivial prediction depends on some understanding of the situation.

The two faces of science are reflected in the classical dichotomy between basic research and applied research. In some cases, the dichotomy is institutionalized by the division of a discipline into two corresponding disciplines. But even when such a divide does not exist, one typically characterizes scientific works as theoretical or applied. Nevertheless, works that are labeled theoretical may turn out to have applied implications and vice versa. In summary, the above dichotomy is conceptually useful, although it does not correspond to a clear divide in reality itself. The two faces of science are reflected in two corresponding value-clusters; the intellectual cluster is pivoted at values such as curiosity, study and understanding; and the instrumental cluster is pivoted at values such as applicability, measurable achievements, and technical competence. Indeed, the intellectual and instrumental value-clusters are closely related, and both clusters are pivotal to science. Still, the corresponding values are not identical, and an overemphasis on one cluster at the expense of other clusters is bound to harm the development of a discipline.

Objectives

We intended to inquire into the following points through this research work.

- To study the scientific attitude of school going rural adolescents.
- To study the scientific attitude of school going urban adolescents.
- To study the difference of school going rural and urban adolescents in relation to their scientific attitude.

Hypotheses

- There is no significant difference between school going rural and urban adolescents in relation to their scientific attitudes.
- There is no significant between school going urban and rural boys adolescents in relation to their scientific attitude.
- There is no significant between school going urban and rural girls adolescents in relation to their scientific attitude.

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Limitations

1. The study was limited to rural and urban areas of only district Shamli (U.P.) India.
2. The study was limited to 200 school going adolescents.
3. The students were selected from different rural and urban schools of Shamli district of Uttar Pradesh.
4. The study was restricted to only one variable i.e. scientific attitude.

OPERATIONAL DEFINITIONS

Attitude

Attitude is a cognitive, affective and behavioral response organized on the basis of experience and knowledge that an individual develops from his/her environment.

According to Whittaker (1968), “An attitude is a precise position or readiness to respond in a predetermine manner to relevant stimuli.”

Attitude always involves the relations of individual to specific objects, person, groups, institutions and values and norms related to his environment. They are not innate and inherent in an individual. Attitude represents the direction as well as the magnitude. Attitude is unquestionably an acquired deposition and therefore conditioned by learning or acquisition of experiences. Heredity factor does not play any role in the formation or development of attitude.

Adolescents

Adolescence is a formative stage of life. Adolescents are generally accepted as students in the thirteen to nineteen age club. The term “adolescence” is derived from the Latin verb “adolescere” which means “to grow to maturity”.

According to Rogers (1981), “It is a process rather than a period, a process of achieving the attitudes, the beliefs needed for effective participation in the society”. Adolescence is also known as revolutionary period of human life from which the child develops into a man or a woman.

Jersild (1963) says “Adolescence is the span in the life of an individual during which boys and girls move from childhood to adulthood mentally, emotionally, socially and physically”.

Scientific Attitude

Scientific attitude means a spirit of critical inquiry that demands the freedom to inquire, to question prevailing ideas and to modify or discard them in favour of new ones. In other words, it implies freedom of speech, academic freedom and freedom of the press (a critical attitude that discourage blind submission), rationality and attentiveness of truth, objectivity and humanism.

According to NSSE (1947), scientific attitude can be defined as “Open-mindedness, a desire for accurate knowledge, confidence in procedures for seeking knowledge and the expectation that the solution of the problem will come through the use of verified knowledge”. Such qualities once developed will prove very beneficial in the life of the pupil.

Rural

In general, a rural area is a geographic area that is located outside cities and towns. Typical rural areas have a low population density and small settlements. Agricultural areas are commonly rural, as are others such as forests. Different countries have varying definitions of

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“rural” for statistical and administrative purposes. In India, rural areas are also known as ‘countryside’ or ‘village’. These have a very low population density. In rural areas, agriculture is the chief source of livelihood along with fishing, cottage industries, pottery etc.

It is generally said that the rural areas house up to 70% of India’s population. Rural India contributes a big chunk to India’s GDP by way of agriculture, self employment, services and construction etc.

Urban

An urban area is characterized by higher population density and vast human features in comparison to the areas surrounding it. Urbanity is characterized by the existence of cities and towns. Urban areas are created and further developed by the process of urbanization. Measuring the extent of an urban area helps in analyzing population density and urban sprawl, and in determining urban and rural populations.

METHODOLOGY

After preparing the conceptual background, the objectives, the hypothesis and limitations of the study were decided. Broadly, normative survey method was followed. The data pertaining to the scientific attitude of the school going adolescents was determined by using science attitude scale test. Statistical methods like mean, standard deviation and ‘t-test’ were applied to analyze the scores and to find out requisite solutions pertaining to the various objectives delineated for the problem. Finally the data was interpreted and conclusions were drawn.

Population

The school going adolescents of class 10 from different schools of district Shamli of Uttar Pradesh were taken as the population of the study.

Sample Of The Study

Sample is the miniature picture of an entire group from which it has been taken. A sample in other words is a smaller representation of a larger whole. The entire group from which a sample has been taken is known as the population. The sample of the present study comprised of 200 students in all. Out of these, 100 belonged to the rural area. The rural sample consisted of 50 girls and 50 boys. Similarly the urban sample consisted of 50 girls and 50 boys.

From Shamli district, 10 rural schools and 10 urban schools were chosen randomly and a total of ten students were taken from each school. In co-educational schools, 5 boys and 5 girls were taken for administration of the test and from other schools 10 boys or 10 girls were taken as per nature of the schools. The schools selected were affiliated to different boards viz Uttar Pradesh Board of Secondary Education, CBSE and ICSE.

Tools Used

For the present investigation, questionnaire developed by **Dr. Sukhwant Bajwa** and **Monika Mahajan** from Department of Education, Punjab University Chandigarh was used as a tool. A questionnaire is a device consisting of a series of questions dealing with some psychological problems or issues. It contained 49 items. There were 28 negative items and 21 positive items.

Scoring Of The Questionnaire

Scientific Attitude Scale can be scored by hand. A positive item would be weighed 5 for a strongly agree (**SA**), 4 for an agree (**A**), 3 for an undecided (**UD**), 2 for a disagree (**D**) and 1

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for a strongly disagree (SD). Similarly a negative item would be weighed 1 for a strongly agree (SA), 2 for an agree (A), 3 for an undecided (UD), 4 for a disagree (D) and 5 for a strongly disagree (SD).

ANALYSIS AND INTERPRETATION OF DATA

To find out the significant difference between the means, if any, in the scientific attitude of rural and urban school going adolescents, the variables were assessed in terms of their scores at the Scientific Attitude Scale Test and the t-test was employed. The analysis of data is presented below.

Significance of the difference between the mean scores of SAS among urban adolescent and rural adolescent boys:

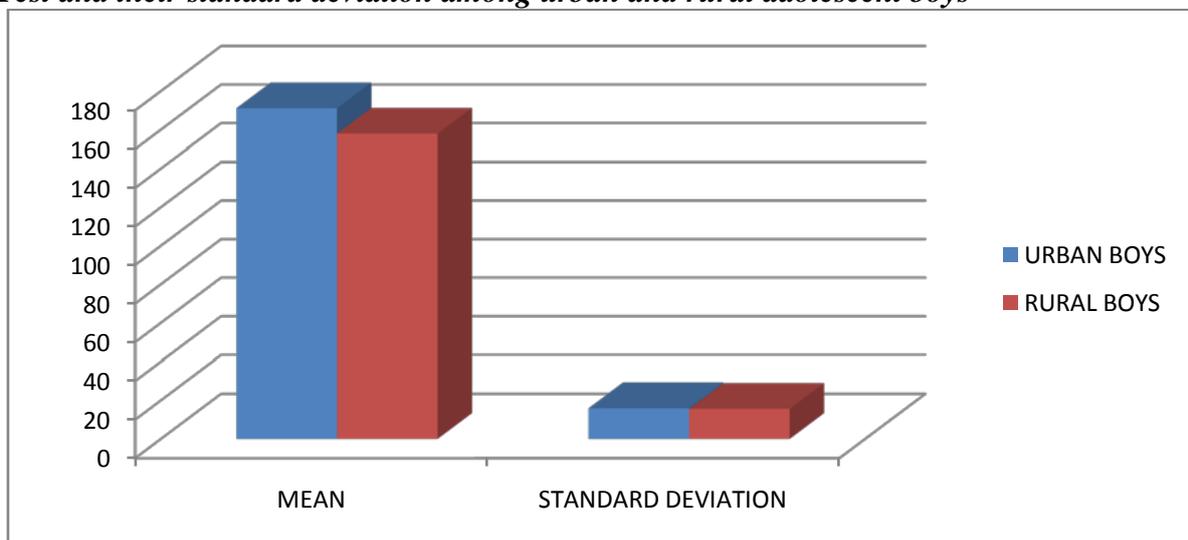
The table showing the Significance of the difference between the mean scores of SAS among urban and rural adolescent boys is given below. Table 1 and figure 1 revealed that the mean scores of Scientific Attitude Scale test among urban adolescent boys and rural adolescent boys are 171.04 and 157.88 and their standard deviation values are 15.86803 and 15.57161 respectively. The calculated value of t-value for the above set of data is 3.710 while the theoretical value for the same data at 0.05 level of significance is 2.010 and 2.680 at 0.01 level of significance.

Table 1: Scientific Attitude between urban and rural boys

Groups	N	M	STD. Deviation	Mean. Difference M1-M2	SED	t-Value
Urban Boys	50	171.0400	15.86803	13.1600	3.54739	3.710
Rural Boys	50	157.8800	15.57161			

This shows that the t-value is significant at 0.05 level of significance as well as at 0.01 level of significance. It revealed that significant difference exists between mean scores of Scientific Attitude Scale Test among urban adolescent boys and rural adolescent boys. Hence the null hypothesis that “There is no significant difference between school going rural and urban adolescents in relation to their scientific attitude” stands rejected.

Figure 1: Bar graph showing the difference of mean scores of Scientific Attitude Scale Test and their standard deviation among urban and rural adolescent boys



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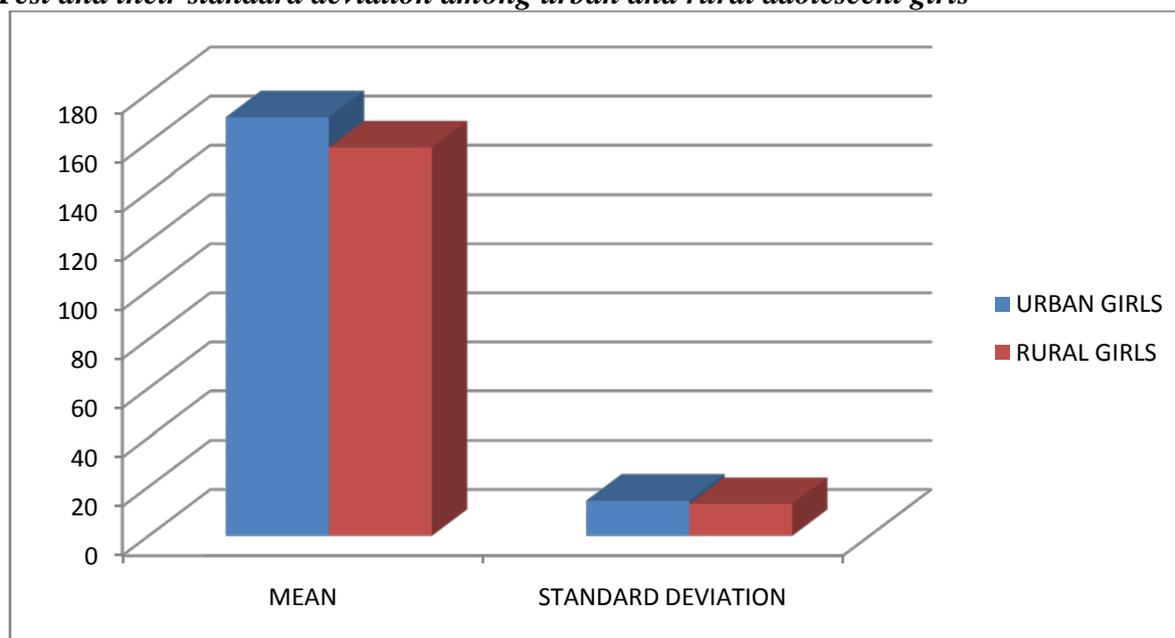
Significance of the difference between the mean scores of SAS among urban and rural adolescent girls: The table showing the Significance of the difference between the mean scores of SAS among urban and rural adolescent girls is given below. Table 2 and figure 2 reveals that the mean scores at Scientific Attitude Scale test among urban and rural adolescent girls are 170.26 and 157.90 respectively and their standard deviation values are 14.33678 and 13.01373 respectively. The calculated t-value for the above

Table 2: Scientific Attitude between urban and rural girls

Groups	N	M	STD. Deviation	Mean. Difference M1-M2	SED	t-Value
Urban Girls	50	170.2600	14.33678	12.36000	2.29173	5.393
Rural Girls	50	157.9000	13.01373			

Set of data is 5.393 while the table value for the same data at 0.05 level of significance is 2.010 and at 0.01 level of significance is 2.680. This shows that the t-value is significant at 0.05 level of significance as well as at 0.01 level of significance. It revealed that significant difference exists between mean scores of Scientific Attitude Scale test among urban and rural adolescent girls. Hence the null hypothesis that “There is no significant difference between school going rural and urban adolescents in relation to their scientific attitude” stands rejected.

Figure 2: Bar graph showing the difference of mean scores of Scientific Attitude Scale Test and their standard deviation among urban and rural adolescent girls



Significance of the difference between the mean scores of SAS among urban and rural adolescent students: The table showing the Significance of the difference between the mean scores of SAS among urban and rural adolescent students is given below. Table 3 and figure 3 reveals that the mean scores at Scientific Attitude Scale Test among urban and rural adolescent students are 170.65 and 157.89 and their standard deviation values are 15.050343 and 14.27712 respectively.

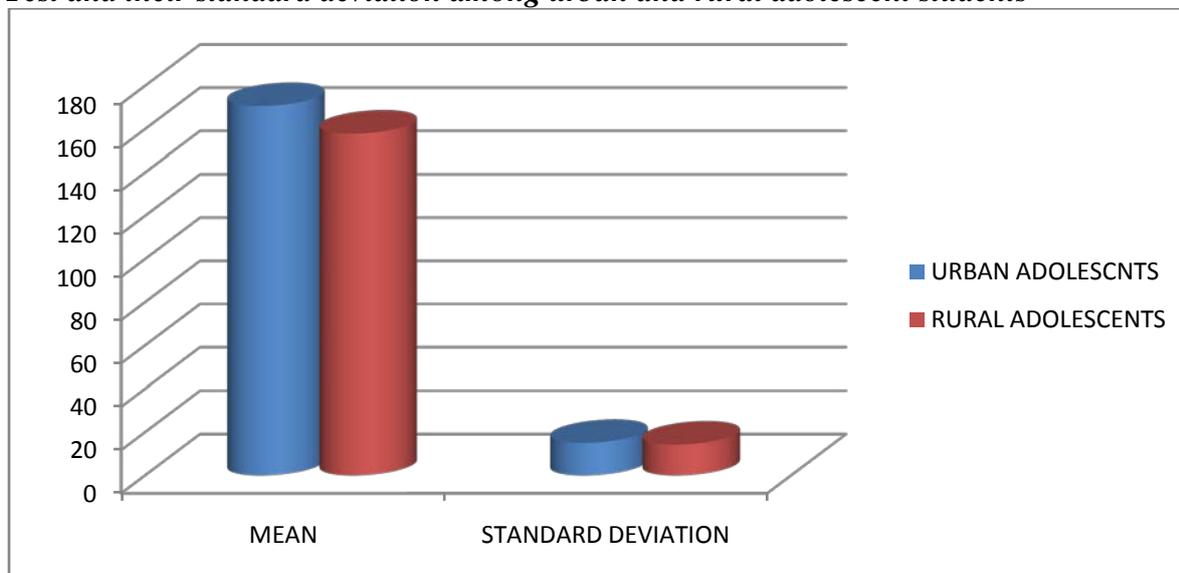
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Table 3: Scientific Attitude between urban and rural students

Groups	N	M	STD. Deviation	Mean. Difference M1-M2	SED	t-Value
Urban Students	100	170.6500	15.05034	12.7600	2.10133	6.072
Rural Students	100	157.8900	14.27712			

The calculated t-value for the above set of data is 6.072 while the table value for the same data at 0.05 level of significance is 1.99 and at 0.01 level of significance is 2.595. This shows that the t-value is significant at 0.05 level of significance as well as at 0.01 level of significance. It revealed that significant difference exists between mean scores of Scientific Attitude Scale test among urban adolescent students and rural adolescent students. Hence the null hypothesis that “There is no significant

Figure 3: Bar graph showing the difference of mean scores of Scientific Attitude Scale Test and their standard deviation among urban and rural adolescent students



Between school going rural and urban adolescents in relation to their scientific attitude” stands rejected. It can be concluded that the attitude of students towards science in general and that of those belonging to the rural areas in particular should be enhanced for betterment of individual and society. Special efforts need be made by the school administrations, teachers, parents, society and especially by government in rural areas in order to enhance the scientific attitude of rural adolescent students so that they would be able compete with urban students.

MAJOR FINDINGS OF THE STUDY

After applying statistical methods on the collected data, the major findings of the study were as under.

1. The rural adolescent boys were found to have less scientific attitude in comparison to their urban participants. Urban adolescent boys were found to have more positive attitude towards science than their rural counterparts.

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2. The rural adolescent girls were found to have less scientific attitude in comparison to their urban counterparts. Urban adolescent girls were found to have more positive attitude towards science than their rural counterparts.
3. The mean scores of urban adolescent student (boys and girls both) were higher than their rural participants. The urban students were found to have a positive scientific attitude when compared to the rural students.

CONCLUSION

The study in hand was conducted to find out the difference in scientific attitude of school going rural and urban adolescents. The present study shows that a significant difference exists between the mean scores of students from the two different backgrounds ie rural and urban. A significant difference also exists between the mean scores of scientific attitude among rural and urban adolescent girls. Overall, a significant difference exists between the mean scores of scientific attitude among rural and urban adolescent students. In order to improve the scientific attitude of rural adolescents, the educational system should take up relevant steps so that the creativity, ability of rational thinking, attitude towards understanding of science and problem solving approach can be improved and the future of student and society can be improved. The results of the study also show that better scientific attitude leads to the better development of educational standards among adolescents.

Thus it can be concluded that scientific attitude and location are closely related. Rural students are less inclined towards science than those belonging to urban area. Also the gender factor has no effect on scientific attitude.

SUGGESTIONS FOR FURTHER RESEARCH

The present investigation like others was limited in both scope and objectives. The analysis of the data of the study has pointed out several gaps which can be filled in many more studies that would be conducted in this field. Some of the suggestions for further research in the area are given below.

1. The same study can be conducted on large sample or population.
2. Several other variables such as motivation, socio-economic status etc. can be analyzed for more meaningful interpretation of the data.
3. A comparative study of the high achievers and the low achievers can be made in different areas of the country.
4. Studies of teachers' behaviour and teaching techniques with regard to lack of scientific attitude of the students can be conducted in different places of the country.
5. A comparative study of perception of rural and urban parents of adolescent students in relation to their scientific attitude can be made.
6. The study may be undertaken for students studying in higher classes.
7. A study may be taken up to find out relationship between scientific attitude and attitude towards other school subjects.
8. Same study may be taken up to find out the attitude towards other school subjects like social studies, languages, math's etc.

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Conflict of Interest

The authors carefully declare this paper to bear not conflict of interests

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