

A COMPARATIVE STUDY OF SCIENTIFIC ATTITUDE AMONG CLASS XII STUDENTS OF GOVERNMENT AND NON – GOVERNMENT SCHOOLS IN DEHRADUN CITY

Anita Verma

Assistant Professor

Education Department

Drona's College of Management and Technical Education

ABSTRACT:

In the present study the researcher has focused on the comparative Study of Scientific attitude amongst Class XII boys and girls of Government and Non - Government Schools in Dehradun City. The objectives of the study are: 1. To find out the scientific attitude of Class XII boys and girls of Government school in Dehradun city. 2. To find out the scientific attitude of class XII boys and girls of Non - Government Schools in Dehradun city. Hypothesis are: Ho1: There is no significant difference of scientific attitude between Class XII boys and girls of Government Schools in Dehradun city. and Ho2: There is no significant difference of scientific attitude between Class XII boys and girls of Non - Government Schools in Dehradun city. The study is confined to class XII boys and girls of government and Non-government schools of Dehradun city.

The researcher adopted a Descriptive Research Method to conduct the present study.

All the boys and girls who are studying in the class XII in Government and Non-Government Schools of Dehradun city, are taken as the population. The researcher used the simple random sampling techniques for the selection of class XII boys and girls of 2 Government and 2 Non-Government Schools of Dehradun city. Standardized tool TOSRA developed by Barry J. Fraser is used for the purpose of this study. The data was analysed using statistical techniques - mean, standard deviation and "t" test. On the basis of present study it can be concluded that scientific attitude is normally and universally distributed among the students. Each and every child has some degree of scientific attitude.

KEY WORDS: Scientific Attitudes, questionnaire, rationally, curiosity, identification, Objectivity, Persistence.

INTRODUCTION

An attitude is a general and enduring positive or negative feeling about some person, object or issue. Scientific attitudes are attributes of an individual who not only behaves outwardly in desirable way towards any scientific endeavour but also understands why they act as they do so.

Scientific attitude is the most important outcome of science teaching and which enables us to think rationally. It is the combination of many qualities and virtues which is reflected through the behaviour and action of the person. It can be defined as a way of viewing things, a curiosity to know how and why things happen in this universe with an open mind.

Rao (1996) stated that the most useful scientific attitudes are 1) open mindedness

ii) critical mindedness, iii) respect for evidence, iv) intellectual honesty, v) willingness to change opinion, vi) search for truth vii) curiosity and viii) rational thinking.

Scientific attitudes are important since they lead to identification of facts i.e., facts are fundamental for the formation of concepts, principles and theories. Scientific attitude is an important aspect for a person who wants to be successful in the field of science and it is the most useful outcome of science teaching.

The Scientific Attitude Scale consists of following dimensions:

Objectivity- In philosophy, objectivity is the concept of truth independent from individual subjectivity. Scientific objectivity refers to the ability to judge without partiality or external influence. Scientific objectivity is a property of various aspects of science. It expresses the idea that scientific claims, methods, results and scientists themselves are not, or should not be, influenced by particular perspectives, value judgments, community bias or personal interests, to name a few relevant factors.

Curiosity-Curiosity is defined here as the desire to seek information to address knowledge gaps resulting from uncertainty or ambiguity. Curiosity is often seen as ubiquitous within early childhood. Science curiosity is a desire to seek out and consume scientific information just for the pleasure of doing so People who are science-curious do this because they take satisfaction in seeing what science does to resolve mysteries.

Open Mindedness- One of the traits of scientific attitudes as described by Haney (1964) is open-mindedness or the ability to receive opinions and conclusions based on new evidence, i.e., to suspend final judgment. It is the quality of being willing to consider ideas and opinions that are new or different from your own. Open-mindedness gives students the ability to embrace different points of view, listen to and consider the perspectives of others before making a decision, understand new ideas and experiences broaden their mind and challenge their thinking.

Persistence- It is the extent to which an attitude is stable over time and remains constant in the absence of a direct challenge. Someone who is persistent continues doing something or tries to do something in a determined but often unreasonable way. Here are some of the things that persistent people have in common that keeps them going long after most people have given up:

- An All-Consuming Vision
- A Burning Desire
- Inner Confidence
- Highly Developed Habits
- Ability To Adjust And Adapt
- Commitment To Lifelong Learning
- Role Models That Act As Guides And Mentors

Knowledge ability- It is the wisdom as evidenced by the possession of knowledge. It is observed as Aversion to superstitions i.e. Rejection of superstitions and false beliefs, Acceptance of scientific facts and explanation.

Creativity- Creativity is a phenomenon whereby something new and valuable is formed. Creativity is one of the ways through which innovations are made. In general, creativity is considered as a scientific attitude since through creativity; scientist can come up with different experiments which lead to significant innovations

Flexibility- Scientists must avoid being rigid on a single idea. Good scientists alter their hypothesis to fit with new evidence. Flexibility is a personality trait used when stressors or unexpected events occur, requiring a person to change their stance, outlook, or commitment. Flexible personality should not be confused with cognitive flexibility, which is the ability to switch between two concepts, as well as simultaneously think about multiple concepts.

NEED OF THE STUDY

Student's attitudes towards a subject deeply affect their learning of that subject. So it is needed to know their attitudes, which will be helpful for the teachers, curriculum designer and head of the school.

STATEMENT OF THE PROBLEM

"A Comparative Study of Scientific Attitude amongst Class XII students of Government and Non - Government Schools in Dehradun City."

OBJECTIVES OF THE STUDY

1. To find out the scientific attitude of Class XII boys and girls of Government school in Dehradun city.
2. To find out the scientific attitude of class XII boys and girls of Non - Government Schools in Dehradun city."

HYPOTHESES OF THE STUDY

Ho1: There is no significant difference of scientific attitude between Class XII boys and girls of Government Schools in Dehradun city.

Ho2: There is no significant difference of scientific attitude between Class XII boys and girls of Non - Government Schools in Dehradun city.

DELIMITATIONS OF THE STUDY

The study is confined to class XII boys and girls of government and Non-government schools of Dehradun city.

METHODOLOGY

The researcher adopted a Descriptive Research Method to conduct the present study. In a descriptive research, a researcher is solely interested in describing the situation or case under their research study.

POPULATION OF THE STUDY

In the present study, all the boys and girls who are studying in the class XII in Government and Non-Government Schools of Dehradun city, are taken as the population.

SAMPLE OF THE STUDY

Sampling is the process of selecting a sample from the population, In this study researcher use the simple random sampling techniques for the selection of class XII boys and girls of 2 Government and 2 Non-Government Schools of Dehradun city,

TOOL USED IN THE STUDY

Standardized tool **TOSRA** developed by Barry J. Fraser is used for the purpose of this study.

Test of Science-Related Attitudes (TOSRA) is designed to measure seven distinct science related attitudes among secondary school students. These scales are called:

- Social Implications of Science
- Normality of Scientists
- Attitude to Scientific Inquiry
- Adoption of Scientific Attitudes
- Enjoyment of Science Lessons
- Leisure Interest in Science
- Career Interest in Science

The seven scales are suitable for group administration and all can be administered within the duration of a normal class lesson.

RELIABILITY AND VALIDITY OF THE TOOL

The scale has test-retest reliability of 0.78 and validity of 0.40 which is properly explained in the questionnaire manual.

DATA COLLECTION

The primary data for the present study were gathered by collecting the responses of class XII boys and girls.

SCORING OF DATA

TOSRA items involve a response format, first described by Likert (1932), which requires students to express their degree of agreement with each statement on a five-point scale consisting of the responses.

Strongly agree (SA), Agree (A), Not Sure (N), Disagree (D), and Strongly disagree (SD) Scoring involves allotting 5,4,3,2,1 for the responses SA, A, N, D, SD respectively, for items designated as positive (+) and allotting 1,2,3,4,5 for the responses SA, A, N, D, SD respectively for items designated as the negative (-)

STATISTICAL METHODS

The data obtained was analysed using statistical techniques - mean, standard deviation and independent sample "t" test.

DATA ANALYSIS AND INTERPRETATION

Analysis has also been made on the overall scores obtained by the students in the questionnaire. The mean, standard deviation, and 't' value were calculated and are shown in the respective tables. Mean difference has been shown in respective figures.

The results obtained in the present study have been presented below with the help of Tables, Figures and their interpretations, whenever necessary.

Ho1: There is no significant difference of scientific attitude between Class XII boys and girls of Government Schools in Dehradun city.

Table: 1

| Gender | N | Mean | Standard Deviation | Degree of freedom | 't' value | Significance |
|--------|----|--------|--------------------|-------------------|-----------|------------------------|
| Boys | 25 | 252.12 | 20.06 | 48 | 0.78 | Significance No |
| Girls | 25 | 253.63 | 18.61 | | | |

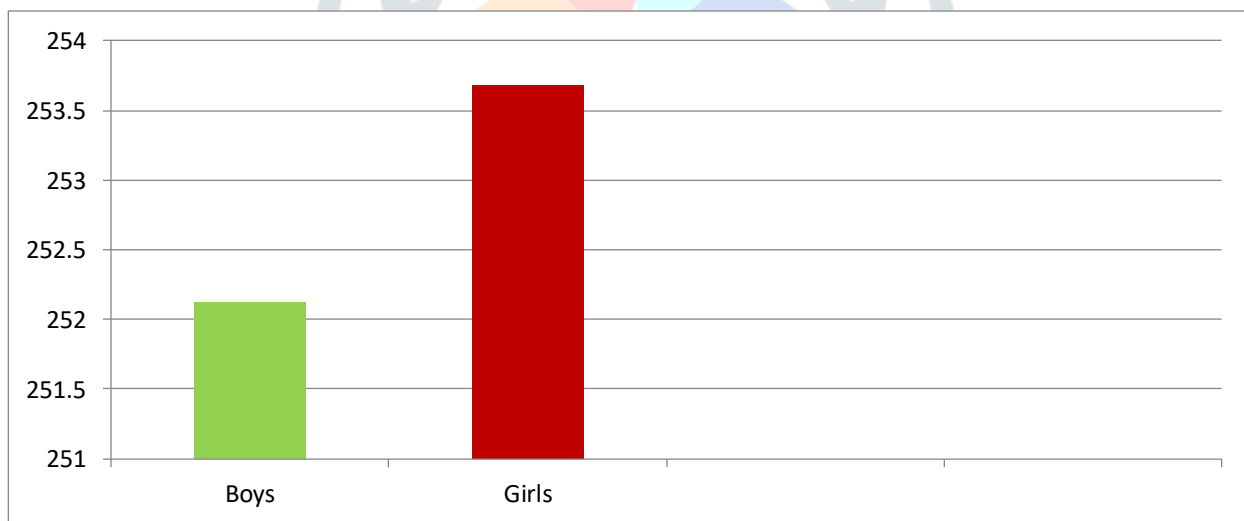


Figure 1: shows the mean difference between the scientific attitude of boys and girls of government school.

The values of mean obtained are 252.12 and 253.68 and standard deviation are 20.06 and 18.61 respectively. The obtained 't' value is 0.78 which is less than table value 2.009 and 0.05 and 2.678 at 0.01 level of significance. Thus, it can be concluded that there is no significant difference in the scientific attitude of class XII boys and girls of government schools of Dehradun city. So hypothesis is accepted.

Ho2: There is no significant difference of scientific attitude between Class XII boys and girls of Non - Government Schools in Dehradun city.

Table: 2

| Gender | N | Mean | Standard Deviation | Degree of freedom | 't' value | Significance |
|--------|----|--------|--------------------|-------------------|-----------|-----------------|
| Boys | 25 | 250.68 | 19.2 | 48 | 0.71 | No Significance |
| Girls | 25 | 252.68 | 18.87 | | | |

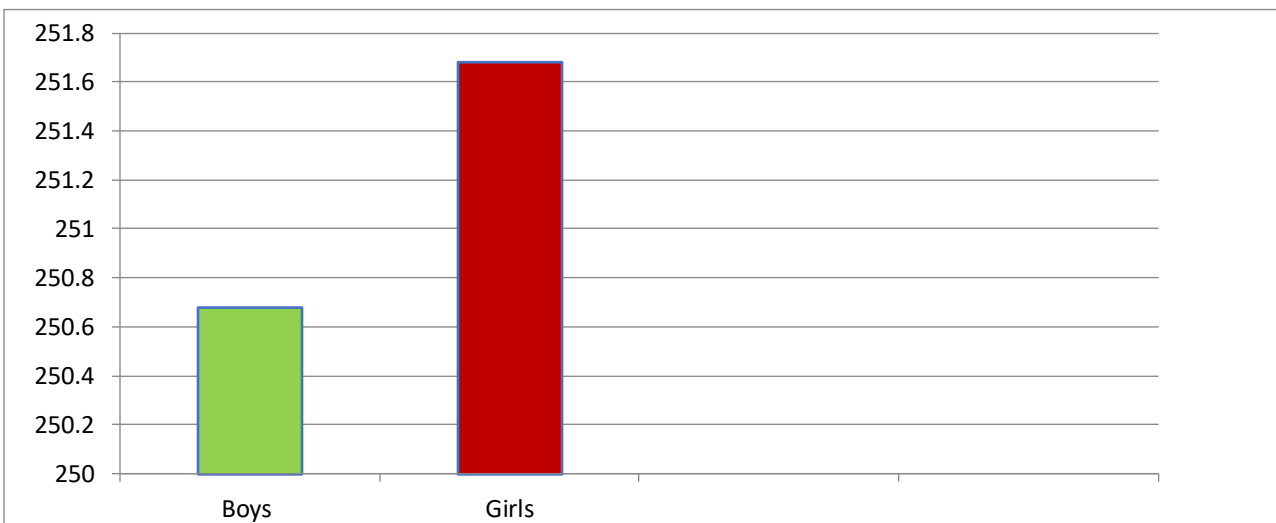


Figure 2: shows the mean difference between the scientific attitude of boys and girls of non-government school.

The values of mean obtained are 250.68 and 252.68 and standard deviation are 19.20 and 18.87 respectively. The obtained 't' value is 0.71 which is less than table value 2.009 at 0.05 and 2.678 at 0.01 level of significance. Thus, it can be concluded that there is no significant difference in the scientific attitude of class XII boys and girls of Non-government schools of Dehradun city. So hypothesis is accepted.

RESULTS AND DISCUSSION

Analysis of scientific attitude has also been made on the overall scores obtained by the students in the questionnaire. For comparison, the mean difference is used as the basis and has been expressed in terms of 't' value. On the basis of statistical values obtained, the following results can be concluded.

Ho1: There is no significant difference of scientific attitude between Class XII boys and girls of Government Schools in Dehradun city.

With respect to the above hypothesis, scientific attitude was compared between the boys and girls of government schools at different scales and on the basis of statistical data obtained following results can be drawn:

The obtained 't' value is 0.78 and is less than table value 2.009 at 0.05 and 2.678 at 0.01 level of significance for all the different scales as well as the overall value. Thus, it can be concluded that there is no significant difference in the scientific attitude of class XII boys and girls of government schools in Dehradun city.

Hence, the null hypothesis is accepted. It is thus stated that there is no significant difference in the scientific attitude of class XII boys and girls of government schools of Dehradun city.

Ho2: There is no significant difference of scientific attitude between Class XII boys and girls of Non - Government Schools in Dehradun city.

With respect to the above hypothesis, scientific attitude was compared between the boys and girls of Non - Government Schools in Dehradun city at different scales and on the basis of statistical data obtained following results can be drawn: The obtained 't' value is 0.71 and is less than the value 2.009 at 0.05 and 2.678 at 0.01 level of significance for all the different scales as well as the overall value. Thus, it can be concluded that there is no significant difference in the scientific attitude of boys and girls of Non - Government Schools in Dehradun city.

Hence, the null hypothesis is accepted. It is thus stated that there is no significant difference in the scientific attitude of boys and girls of Non - Government Schools in Dehradun city.

CONCLUSION

The present study is the moderate attempt to explore the scientific attitude of class XII students of Government and Non- Government schools. On the basis of finding, interpretation and discussion following conclusion may be drawn: There is no significant difference between the scientific attitude of class XII boys and girls of Government Schools in Dehradun city.

There is no significant difference between the scientific attitude of class XII boys and girls of non-government schools in Dehradun city.

On the basis of present study it can be concluded that scientific attitude is normally and universally distributed among the students. Each and every child has some degree of scientific attitude.

EDUCATIONAL IMPLICATIONS

- The study will help the teacher to teach the students according to their scientific attitude.
- The study will help the curriculum framers to make provisions for developing scientific attitude and logical thinking.
- The study will help the evaluators to put such objective questions in the examination so that scientific attitudes can be judged.
- Knowledge about the level of scientific attitude and creativity would help the students to build up their career.
- The study will help the students to select a course of their own interest.
- Knowledge about the level of scientific attitude would help the teacher to give essential guide lines to their student to develop fluency, flexibility, originality, rationality, curiosity, open mindedness, confidence, a version to superstitions.

SUGGESTIONS

- Teacher and parents should provide proper guidance, environment, and encouragement and motivation to the students so they carry out various tasks and experimental part independently.
- The power of self-exploration, innovation, investigation should be developed among students with the help of scientific method.
- Teacher should include activities like seminars, projects, assignments etc., which can enhance the scientific attitude among the students.
- Teachers should motivate the students to take part in science fairs to promote scientific attitude.
- School management should make provisions for students to participate in State, National and International science fairs, field trips, science exhibitions etc.
- Enriching of libraries and laboratories in the school and surroundings.
- Refresher courses for teachers and students should be incorporated.

BIBLIOGRAPHY

- Chakraborty, S. (2015). A study on Scientific Attitude of Secondary School Students of Dilbrugarh District of Assam. <https://shoshganga.infliboet.ac.uy/handle/10603/250121>
- Dani, D.N. (1984). Scientific Attitude and Cognitive Styles of Higher Secondary Students. Fourth Survey of Research in Education (1983-88), Vol 1, New Delhi: NCERT
- Ediger, Marlow. (2006) Scientific attitude and scientific aptitude. In: Progress Publication, Moscow.
- Ediger, et al. (2003). Scientific Attitude Vis-à-vis Scientific Aptitude New Delhi: Discovery Publishing House.
- Gogoi, M., & Munda, B. (2016). Scientific attitude of secondary school students of Sivasagar district in relation to their achievement in science. International Journal of Innovation Science and Research, 5(02), 637-641
- Gokul, Raj, R., & Malliga, T. (2015). A study on scientific attitude among pre service teachers. Research Journal of Recent Science, 4, 196-198.
- Grant, Edward. (2007). Ancient Egypt to Plato. A History of Natural Philosophy From the Ancient World to the Nineteenth Century (1st ed., pp. 1-26) New York: Cambridge University Press.
- Jancirani, R., Dhevkrishnan, R., and Devi, S. (2012) A Study on Scientific Attitude of Adolescence Students in Namakkal District. International Educational E-Journal, (Quarterly), 1(4), 1-8. <http://www.ourj.org/cjournal/july-augsept2012/01.pdf>