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Review Of Research

# IMPACT OF LOCALITY, GENDER AND SES ON SCIENTIFIC ATTITUDE

Ramesh Sandhu
CR College of Education Hisar.

**ABSTRACT**

Development of scientific attitude is the core matter and is the need of the hour along with gaining of knowledge. Science has uplifted our lives and society. It has transformed health, communication, transportation and power. The aim of science education is not merely to acquire knowledge but emphasise on developing scientific attitude and training in scientific method etc. Such attitude should be developed which is characterised by willingness to reach the truth and help in understanding, analysing and solving the problems scientifically. Scientific attitude is type of attitude where science becomes a base for attitude development. The aim of the investigator is to find out the impact of locality, sex and socio economic status of senior secondary students on their scientific attitude. A sample of 200 students was selected. A self prepared scale was used to collect the data. Statistical techniques like mean, percentage and three way analysis of variance (ANOVA) were applied for analysis and interpretation of the data. The results of the study indicated that students possess favourable scientific attitude. Locality has significant effect on scientific attitude of students. Urban students were found to have more favourable scientific attitude than rural area students. Scientific attitude is independent of gender and there is no significant difference in scientific attitude between boys and girls. SES have significant effect on scientific attitude and student with high SES have more favourable attitude as compared to middle SES and low SES students. The two factor interactional effects (locality and SES) and (Sex and locality) were also found significant on scientific attitude. Similarly three factor interactions of locality, gender and SES have also significant effect on scientific attitude of the students.

**KEYWORDS:**Locality, gender, SES and scientific attitude.

## IINTRODUCTION

Science has played a vital role in the development of society and have transformed our way of life in several aspects like health, communication, transportation and power generation. Science is an endless human enterprise which is self accumulating, self growing, self pervading and self accelerating. Science has its origin from the collective curiosity of man. Since it strive forward on the wheels of dogmatism, dynamism and discovery simultaneously. The aim of science education is not just to gain scientific knowledge but also to foster scientific attitude, scientific method in the students. The emphasis is on building an attitude that helps the students in understanding, analysing the problem and solving the problem both at local and global levels. So, rational and logical thinking must be developed among the students. National Education Policy (1986) has also considered the importance of science education in general education and suggested that science should be visualised as a vehicle to train a child to think reason, analyse and to articulate logically.

## ATTITUDE

Attitude is the state of mind which is based on previous experience, beliefs and cultural effects. Attitude makes us what we are and constitutes the central part of our thinking and mentality. Allport (1985) have defined it in detail and gave a comprehensive definition as '"An attitude is a mental state of readiness organised through experience exerting a dynamic influence upon the individual response to all objects and situations with which it is related." According to Krech and Crutchfield (1948), "An attitude can be defined as an enduring organisation of motivational, emotional, perceptual and cognitive process with respect to some aspect of the individual's world". Thus attitude can be described as ideas with emotional content, cultural beliefs, prejudices, biases, predispositions and as state of readiness. Such ideas has intellectual, biological, social and emotional components that are derived from experience and have a significant effect upon behaviour. Sometimes attitude can be considered as a habitual way of looking at an object, person or an idea.

## SCIENTIFIC ATTITUDE

Scientific attitude is a kind of attitude where science becomes the foundation stone for building the scientific attitude. Scientific attitude promote to think logically and work in a systematic way. Science requires logic, reasoning and evidence to prove itself. Above all, it gives direction to think in proper way. Scientific attitude is based on proof, logical thinking and problem solving approach. Among the first comprehensive study published of scientific attitude was Noll's (1935) analysis which included such habits as those of intellectual honesty, open mindedness and suspended judgements. A person with scientific attitude have flexible approach to change himself on the basis of proven evidence and ability to act according to its perception, intellectually honest, unbiased, do not believe in superstitions, always search for the truth and have such mental state which accept truth based on facts. According to NSSE, scientific attitude can be defined as open mindedness, a desire for accurate knowledge, confidence in procedure for seeking knowledge and expectation that the solution of the problem will come through the use of verified knowledge. Scientific attitude is just like other acquired personality characteristics. It can also be learned through observation, careful learning and by acquiring correct knowledge. Social factors like home environment, culture, locality etc. are the major determinants of scientific attitude.

## DIFFERENCE BETWEEN SCIENTIFIC ATTITUDE AND ATTITUDE TOWARDS SCIENCE

Attitude towards science is the general and enduring positive or negative feeling about science.

It may have positive or negative impact on academic achievement of that subject, While, scientific attitude has a cognitive aspect that strive to search the truth, fact and knowledge. Scientific attitude develops logical, rational and critical thinking. Attitude towards science is concerned with liking or disliking towards science, whereas, scientific attitude promotes thinking based on knowledge. Conclusively, it can be said that in scientific attitude knowledge for truth is emphasised, whereas, in attitude towards the science, emotional aspect is stressed.

## NEED OF THE STUDY

All the superstitions obstruct the development of an individual, society and a nation. To eradicate this evil, right knowledge along with proof is required so that it can direct one towards proper thinking and systematic planning. Scientific attitude is the key solution of this problem. Science believes in discovering the cause and inventing the remedies thus modifying almost every sphere of life. Developing the scientific attitude will help to meet the demands of (1) daily life (2) further scientific thinking (3) work in related field of science. Having developed a scientific attitude towards life, a student can meet the challenges of explosion of technological development. Scientific attitude helps to come out of various superstitions and promote critical and logical thinking which is necessary for the progress of society. Thus there is need to conduct a research on factors affecting scientific attitude.

## REVIEW OF RELATED LITERATURE

Allport (1935) concluded that attitude is probably the most distinctive and indispensable concept in social psychology. Srivastava (1986) indicated that the four groups i.e. Science teachers, Non science teachers, science students and non-science students have positive scientific attitude. There is significant difference in scientific attitude between boys and girls however there is no significant difference in male and female teachers.

Dani (1989) found that scientific attitude of science students is significantly higher than that of commerce and arts students.. Ghosh(1989) indicated that scientific aptitude is directly correlated to scientific attitude which further depends upon their perception of science teaching and nature of learning experience. Srinivas and Sundarajan (1990) concluded that higher secondary students show positive correlation between scientific attitude and attitude towards sciences. It was also found that high score in the subject is related with high degree of scientific attitude of students. Dubey (1992) concluded that all groups of students showed significant level of scientific temper. It was further observed that attitude towards science is related with scientific attitude. Bagchi (2000) found that students showed more scientific attitude when they studied through practical methods. Guerrero (2001) found that scientific attitude of children was more than scientific attitude of their parents. Panigrahi (2003) concluded a positive correlation between scientific attitude and intelligence, however, there exist low correlation between scientific attitude and SES, Pillai (2012) revealed that male and female students had no significant difference in respect of their scientific attitude. Government and private school students, rural and urban area students showed significant difference in respect of their scientific attitude. Olasehinde and Olatoye (2014) showed that there is significant positive correlation between scientific attitude and attitude towards science. However, there is no significant difference between male and female students in scientific attitude, attitude towards science and science achievement. Singh and Mishra (2014) found that high academic achievers have better scientific attitude than low academic achievers. Arts, science and commerce pupil teachers differ significantly in their scientific attitude.

## OBJECTIVES:-

1. To study the effect of locality, gender and socio- economic status on scientific attitude of senior secondary school students.
2. To study the two factor and three factor interactional effect of locality, gender and socio-economic status on scientific attitude of senior secondary students.

## HYPOTHESIS:-

1. There may exist significant effect of locality, gender and socio-economic status on scientific attitude.
2. There may exist significant two and three factors interactional effect of locality, gender and and socio-economic status on scientific attitude.

## SAMPLE AND DESIGN OF THE STUDY :-

The investigator used stratified random sampling technique to collect data from sample of 200 students of 10+2 class from 10 schools of Hisar district. Out of 200 students, 100 were male and 100 female, 100 were from rural area and 100 from urban area.

## Tools Used

1. Scientific attitude scale: Self prepared
2. Socio-Economic Status Scale: Self prepared.

## 1. SCIENTIFIC ATTITUDE SCALE

Scientific attitude scale is an instrument designed to measure scientific attitude of senior secondary students. This scale was developed on the basis of Likert type scale. This scale consisting of 30 items. The items touched all the dimensions of scientific attitude. Item analysis was done to increase the reliability and validity of the test. Item analysis is primarily concerned with item difficulty and item discrimination. The investigator applied split-half reliability corrected by Spearman Brown Prophecy for calculating reliability. The reliability coefficient was found 0.86. The validity of a test is concerned with what the test measures and how well it does. A test is said to be valid if it actually measures what it purports to measure. First of all, the logical and face validities were established. In the present case, the items in this scale were included on the basis of earlier studies and also on the basis of areas of scientific attitude scale as given by various researchers, educationist and psychologist. Hence, there could be no doubt about its high logical and face validity, The investigator also established its intrinsic validity which was calculated by the square root of the proportion of its true variance i.e. reliability The validity was found 0.92. It has been a common belief that the practical validity of a test, other things being equal, is directly proportional to its reliability. The sufficiently high and significant value of validity coefficient confirm the validity of this scale. Both reliability and validity have high value.

## SCORING:-

Likert method of scoring was used in scientific attitude scale. 5 marks were given to 'strongly agree' response, 4 marks to 'agree' response, 3 marks to 'uncertain' response, 2 marks to 'disagree' response and ‘1 mark' to strongly disagree, response for positive statements. While for negative statements, the order of marking was reversed i.e. I mark for strongly agree, 2 marks for agree, 3 marks for uncertain, 4 marks for disagree and 5 marks for strongly disagree response. All the scores in 30 items were summed up to know the total scientific attitude scoreof a student.

## (II) SOCIO-ECONOMIC STATUS SCALE (SES)

This scale was developed to measure correctly the socio- economic status of the students. This scale was constructed on the basis of education, caste, occupation, economic condition, movable and immovable property of the student' parents. The scoring key summarises the information recorded on the scale. The weightage of each item has been written on the key. The key is transparent and can be used in most convenient manner by putting the key on the scale and adding the marks obtained in various items. The reliability coefficient of the SES scale was found out by test-retest method. The reliability coefficient of SES was found to be 0.95. Validity of this scale was established through (i) "Matching against outside criterion" and (ii) methods of contrast groups. Thus the concurrent validity found by both methods and was found to be high and significant.

## STATISTICAL TECHNIQUES USED

Mean, S.D., t-test, three ways ANOVA

## RESEARCH METHODOLOGY

The investigator used the descriptive method through survey.

## ANALYSIS AND INTERPRETATION

In order to verify the above motioned hypothesise, the data was analysed by using three way ANOVA to find out the individual and interactional effects of locality, gender and SES on the scientific attitude as given in table 1.Percentage of score obtained on scientific attitude scale show that 65.1% students scored 70.0% and more than 70.0% score in their scientific attitude, It indicates that majority of the students possess high level of scientific attitude.

### SUMMARY OF ANOVA ON ATTITUDE SCORE IN RELATION TO LOCALITY, GENDER AND SOCIO-ECONOMIC STATUS (SES).

| Sr. No. | Sources of Variance | SS | df | MS | F-Ratio | Significance Level |
|---|---|---|---|---|---|---|
| 1. | Locality | 296.31 | 1 | 296.31 | 28.67 | significant at 0.01 level |
| 2. | Gender | 3.87 | 1 | 3.87 | 0.39 | Nonsignificant at 0.05 level |
| 3. | SES | 1044.21 | 2 | 522.11 | 51.02 | Significant at 0.01 level |
| 4. | Locality X Gender | 0.54 | 1 | 0.54 | 0.05 | Nonsignificant at 0.05 level |
| 5. | Gender X SES | 163.84 | 2 | 81.92 | 8.02 | Significant at 0.01 level |
| 6. | Locality X SES | 311.62 | 2 | 155.81 | 14.83 | Significant at 0.01 level |
| 7. | Locality X Gender X SES | 185.56 | 2 | 92.78 | 9.98 | Significant at 0.01 level |

1. The calculated F-ratio for main effect of locality is 28.67 which are higher than the table 6.64 against 1/188 df at 0.01 level. Thus locality has a significant effect on scientific attitude of the students. The mean attitude score of urban area students is 105.67 while mean attitude score of rural students in 92.43. Therefore, urban students have higher scientific attitude than rural students. Thus the hypotheses that there is significant effect of locality on scientific attitude is accepted.

2. The calculated value of F-ratio for main effect of gender is 0.39 which is less than the table value 3.84 against 1/188 df at 0.05 level. Therefore, gender has no significant effect on scientific attitude of the students. Thus, the hypothesis that there is significant effect of gender on scientific attitude is rejected.

Thus there is no difference in scientific attitude between male and female students.

3. The calculated value of F-ratio for main effect of variable socio-economic status is 51.02 which is more than the table value 6.64 against 1/188 df at 0.01 level. It shows that SES show significant effect difference in the scientific attitude. Further application of t-ratio shows that students belonging to high SES have more favourable attitude than that of middle SES and low SES students, similarly middle SES students have more favourable attitude than low SES students.

4. The calculated value of F-ratio for interactional effect of locality and gender is 0.05 which is less than the table value 3.84 at 0.05 level. Thus two factor international effect of locality and gender on the scientific attitude is not significant.

5. The calculated value of F-ratio for the interactional effect of gender and SES is 8.02 which is more than the table 6.64 against 1/188 df at 0.01 level. This indicate that these two factors when made to work jointly reveal significant difference in scientific attitude of students. Thus, scientific attitude of students is dependent on socio-economic status in relation with sex or gender.

6. The interactional effect of locality and SES on scientific attitude of students is significant. The result shows that mean score of urban area high socio- economic status students is highest while that of rural area low socio-economic status is lowest.

7. The calculated value of F-ratio for the triple interactional effect of locality, gender and socio-economic status is 9.98 which is more than the required table valve at 0.01 level of significance. It shows that these three factors when made to work jointly revealed significant difference in scientific attitude. Thus the hypothesis of three factor international effect on scientific attitude is accepted.

## RESULT AND DISCUSSION

The result shows that there is no significant differences in the scientific attitude between male and female student which is in consonance with many other research studies mentioned above. However, it has been found that locality and socio-economic status as main variables has significant effect on scientific attitude of the students. Urban area and high socio-economic status (SES) possess greater scientific attitude than rural area and low SES students. Thurs there is need to raise the standard of rural area schools and government schools where low SES students study. There is an urgent need to spread awareness against the prevalent superstitions among the society. The teachers should develop critical, logical and creative thinking among the students and discourage rote memorisation. Such kind of thinking and open-mindedness and rationality in their ideas would help in development of scientific attitude among all the students. It has also been found that effect of these factors gets multiplied when they work jointly. Thus there is an urgent need of training the teachers in development of scientific attitude among the students. The teachers should emphasise on inculcating scientific attitude instead of cramming by the students.

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