

SCIENTIFIC TEMPER AND ACHIEVEMENT IN PHYSICS

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ABSTRACT

The present study intended to find out the level of Scientific Temper and Achievement in Physics among the Higher Secondary School Students. The present study belongs to the Normative Survey Method and the size of the sample was 300 Students who were selected through Stratified Random Sampling Technique. The Statistical techniques used in this study were Mean, Standard Deviation, 't'-test and Correlation to analyze the data. The salient findings of the study were i. The Scientific Temper was found to be high whereas the Achievement in Physics was found to be average. ii. The female students were having significantly higher level of Scientific Temper than the male students. iii. The Rural Students were having significantly higher level of Achievement in Physics than the Urban Students.

INTRODUCTION

Scientific Temper is a personality dimension of a person associated with one's basic drives to think in a systematic and scientific way. Scientific Temper is not really the knowledge of a particular subject that defines such a temper. A Scientific Temper refers to an open, question seeking mind. A mind seeks truth and accepts it when proved. A mind that is curious to understand 'whys' and 'hows' of life while accepting that all questions may not be fully answerable.

Scientific Temper is an attitude, a way of living which should be applicable to all aspects of our life. The essence of scientific method in his outlook and uses it in his everyday life as possessing "Scientific Temper". One may not necessarily be a scientist, not even a science student and yet have Scientific Temper. This Scientific Temper is characterized by some traits such as; Healthy, Universalism, Freedom from prejudice or bias, Objectivity, Open mindedness and humility, Willingness to suspend judgement without sufficient evidence, positive approach to failure etc. Universalism is an important characteristic of Scientific Temper. The attributes of Scientific Temper like, honesty, truthfulness, perseverance, positive approach to failure are essentially some of universal human values which are important for happiness of an individual and the society.

NEED FOR THE STUDY

In the era of this scientific knowledge, science education has no longer confined to a few seriously devoted persons. Since life in the present world invariably warrants, to variable degrees, knowledge of scientific facts and laws, science has now become a necessity for everyone. Teaching of science for everybody has become an unavoidable part of general education. They have to be imbibed and not merely imparted. But our anxiety is not to invest our best brains outside the country, but to impart Scientific Temper in our education curriculum and not inculcating this spirit in our young minds. The explosion of scientific knowledge has been so rapid in our age, that with the passing of every decade, our stock of knowledge on any subject has tended to become double or more. For advancement of culture and civilization in the adequate direction, the development of Scientific Temper among younger generation is now considered as a vital task in our New Education Policy. Hence the investigators wanted to know the connection between Scientific Temper and Achievement in Physics among the Higher Secondary School Students. Hence the topic has been coined as "*Scientific Temper and Achievement in Physics*".

OBJECTIVES OF THE STUDY

The objectives of the study are as follow.

- i. To find out the level of Scientific Temper and Achievement in Physics among the Higher Secondary School Students.
- ii. To find out the level of significant difference in Scientific Temper and Achievement in Physics among the Higher Secondary School Students with respect to their background variables such as Gender and Locality.
- iii. To find out the level of significant relationship between Scientific Temper and Achievement in Physics among the Higher Secondary School Students.

HYPOTHESES OF THE STUDY

The Null Hypotheses have been framed and they are as follow.

- i. The level of Scientific Temper and Achievement in Physics among the Higher Secondary School Students are low.
- ii. There is no significant difference in Scientific Temper and Achievement in Physics among the Higher Secondary School Students with respect to their background variables such as Gender and Locality.
- iii. There is no significant relationship between Scientific Temper and Achievement in Physics among the Higher Secondary School Students.

METHODOLOGY OF THE STUDY

The present study belongs to Normative Survey Method, as the study was intended to measure the present status of Scientific Temper and Achievement in physics among the Higher Secondary School Students

Tools Used:

Two types of tools were used in the present study. One was the Scientific Temper Scale (STS) and it was standardized by Krishna, K and Bhuvaneswari, H (1989). The other tool, Achievement Test in Physics (ATP) was developed by the investigators. The multiple choice questions with 4 alternatives were framed from the 2 units of the 11th standard physics text book. The drafted multiple choice items were given to two experts, one was 11th standard teacher who handles physics portion and the other was teacher educator. By following the split half method, correlation co-efficient was found out. As the r value was found to be 0.82, the tool was considered to be good an administering for measuring Achievement in Physics (ATP) among the Higher Secondary School Students.

i) Selection and Size of the Sample

Through the Stratified Random Sampling technique, the investigators have selected a sample of 300 Higher Secondary School Students from various Higher Secondary School Students in Vellore District.

ii) Data analysis

The Statistical Techniques used to analyze the collected data were Mean, Standard Deviation, 't'-test and Correlation.

Table-1

Scientific Temper and Achievement in Physics among the Higher Secondary School Students in Total

S.No	Category	Size of the sample	Mean	SD	Remark
1	Scientific Temper	300	81.48	5.21	High
2	Achievement in Physics	300	56.36	16.11	Average

The above table-1 shows that the level of Scientific Temper is found to be high. At the same time, the level of Achievement in Physics is average.

Table-2

't' value between the Mean Scores of the Scientific Temper among the Higher Secondary School Students with respect to their Gender

Category	N	Mean	SD	't' value
Male	160	80.97	5.17	2.39*
Female	140	82.07	5.26	

***Significant at 0.05 Level**

The above table-2 shows that the 't' value, 2.39 is significant at 0.05 level. The female students are having significantly higher level of Scientific Temper than the male students. Hence, the framed null hypothesis is found to be rejected.

Table-3

't' value between the Mean Scores of the Scientific Temper among the Higher Secondary School Students with respect to their Locality

Category	N	Mean	SD	't' value
Rural	148	82.03	5.21	1.24**
Urban	152	80.95	5.17	

****Not Significant at 0.05 Level**

The above table-3 shows that the 't' value, 1.24 is not significant at 0.05 level. The result reveals that there is no significant difference between the level of Scientific Temper among Rural and Urban Students. Both the Rural and Urban Students are having similar level of Scientific Temper. Hence, the framed null hypothesis is found to be accepted.

Table-4

‘t’ value between the Mean Scores of the Achievement in Physics among the Higher Secondary School Students with respect to their Gender

Category	N	Mean	SD	‘t’ value
Male	160	56.31	18.27	1.24**
Female	140	58.57	13.19	

****Not Significant at 0.05 Level**

The above table-4 reveals that the ‘t’ value, 1.24 is not Significant at 0.05 level. The result reveals that there is no significant difference between the level of Achievement in Physics among the male and female Higher Secondary School Students. It may also be stated that both the male and female students are having similar level of Achievement in Physics. Hence, the framed null hypothesis is found to be accepted.

Table-5

‘t’ value between the Mean Scores of the Achievement in Physics among the Higher Secondary School Students with respect to their Locality

Category	N	Mean	SD	‘t’ value
Rural	148	64.74	14.64	8.77*
Urban	152	50.18	14.14	

***Significant at 0.05 Level**

The above table-5 shows that the ‘t’ value, 8.77 is Significant at 0.05 level. It reveals that the Rural Students are having significantly higher level of Achievement in Physics than the Urban Students. Hence, the framed null hypothesis is found to be rejected.

Table-6

Significant relationship between Scientific Temper and Achievement in Physics among the Higher Secondary School Students

Classification	N	‘r’
Scientific Temper and Academic Achievement in Physics	300	0.11*

***Significant at the level of 0.05**

The above table-6 shows that the ‘r’ value, 0.11 is significant at 0.05 level. It implies that there is significant relationship between Scientific Temper and Achievement in Physics among Higher Secondary School Students. Hence, the framed null hypothesis is found to be rejected.

FINDINGS OF THE STUDY

The findings of the study are briefly given below.

- i. It is found that the Scientific Temper is found to be high whereas the Achievement in physics is found to be average.
- ii. The female students are having significantly higher level of Scientific Temper than the male students.
- iii. Both the Rural and Urban Students are having similar level of Scientific Temper.
- iv. Both the male and female students are having similar level of Achievement in Physics.
- v. The Rural Students are having significantly higher level of Achievement in Physics than the Urban Students.
- vi. There is significant relationship between Scientific Temper and Achievement in Physics among the Higher Secondary School Students.

EDUCATIONAL IMPLICATIONS OF THE STUDY

The study found that the students are having higher level of Scientific Temper and it has reflected on the Achievement in Physics. As the students are having higher level of Scientific Temper, if they are properly motivated and logically explained the concepts by the teachers in a systematic manner, the students may achieve good Achievement in Physics. Workshops and internship training may be conducted to the teachers and this will definitely bring good impact on the achievement of the students. Male students may be given some extra coaching on learning process so that they may also raise the level of Achievement in Physics.

Use of teaching-learning materials, ICT and emphasis on learning by doing may be useful in fostering Scientific Temper among science students. Science is the product of creative thinking. The development of creative genius of our youth should be of prime importance in our education system.

Scientific Temper is a refined human nature and a major outcome of this must be on the systematic irrespective of subjects. It will be better to organize various co-curricular activities such as science fair, science exhibitions, scientific debate; science club etc. and use of inductive inquiry training model, concept attainment

model, project method, problem solving method, Brain storming and programme instruction in teaching rather than conventional method of teachings.

CONCLUSION

The present study measured the influence of Scientific Temper towards the Achievement in physics among the Higher Secondary School Students. From the perusal of the above findings, it is understood that the Higher Secondary School Students have high Scientific Temper irrespective of their scores in physics and the variables. The study revealed the gender difference on the Scientific Temper and its influence on Achievement in physics with respect to gender and locality.

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