

High School Students' Attitude towards Science

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ABSTRACT

Attitude towards Science indicates feeling of an individual or a group concerning Science like faith in scientific method, opinion about scientists, value of Science, interaction of Science with individual and society, opinion held about Science related social issues. This piece of research work aimed to find the attitude towards Science of Ninth standard students. This investigation is a part of an Experimental Study. The data was collected from 35 English Medium students those who studied under State Board of Education, Tamil Nadu. The tool, attitude towards Science developed by Barmby, Kind and Jones (2008) was used to collect the data. The tool has 37 statements. Out of which 32 items are favourably worded and the remaining 5 items are unfavourably worded. Likert's method of summated ratings was adopted to find the level of attitude. This scale has face validity, content validity and construct validity. The reliability of the tool is 0.86. The result shows that the Ninth standard students have a favourable attitude towards Science.

KEY WORDS: Attitude, Science, High School Students.

INTRODUCTION

Science is not just a body of knowledge; it is knowledge as well as the process of continuous development and refinement. Science is not only a process but also a product. This is an age where the modern life is completely based on the scientific environment as Science has become an integral part of human society. Great advancements of Science and technology and the use of these scientific achievements in promoting the well being of mankind through their application in the field of industry, communication, transport, engineering, agriculture and medicine has made Science more important than ever before.

The whole process of education is to shape and mould the human personality called the student who plays the vital role in the system of education. The secondary education is a significant stage in the educational ladder in which Science is an important step. Therefore, it is essential to study the high school students' attitude towards Science.

REVIEW OF RELATED STUDIES

Jonathan Osborne, et.al., (2003), carried out a study on attitudes towards Science: a review of the literature and its implications. This article offers a review of the major literature about attitudes to Science and its implications over the past 20 years. It argues that the continuing decline in numbers choosing to study Science at the point of choice requires a research focus on students' attitudes towards Science if the nature of the problem is to be understood and remediated.

Rana Zamin Abbas, et.al., (2011) carried out a study on measuring the attitude towards Science in Pakistan a study of secondary school students. The study aimed to assess the attitude of students of secondary classes towards Science. The study revealed that all students of secondary classes had positive attitude towards Science. Attitudes of females are even more positive. Similarly students of Science Group have more positive attitude than those of Humanities Group. The study further revealed that parental attitude and school type also contribute towards development of positive attitude of students towards Science.

Azizollah Arbabi Sarjou, et.al., (2012) carried out a study of Iranian students' attitude towards Science and Technology, School Science and Environment. The researcher has investigated attitudes towards Science and technology, school Science and environmental issues among middle school students. Results indicated that there is a positive attitude towards Science and technology, school Science and environmental issues among students in three components of study. However, there was not a positive attitude towards some items of these components. The results also showed that in three components of the study, only there is a meaningful difference between males and females points of views in attitude towards environmental issues. According to this result, males have higher averages than the females.

Rakhee Chaudhary, et.al., (2013) studied the developmental attitude towards Science among girls of secondary and college-level. The purpose of this study is to investigate whether the girls' interest level and attitude in different Science subjects have changed as they continued their studies beyond secondary school level. The results of the study revealed that the girls' attitude shows that they always remain less interested in performing experiments and some extra efforts have to be done at school level itself.

Arockiya Priscilla, M, (2014), conducted a study on teachers, parents and learners attitude towards Science exhibition at secondary level in Virudhunagar District. The objectives of the study is to find out the attitude of teachers, parents and learners at secondary level towards Science exhibition. The findings of the study revealed that,

- i) The majority of teachers (65%) at secondary level are having positive attitude towards Science exhibition.
- ii) The majority of parents (60%) at secondary level are having positive attitude towards Science exhibition.
- iii) The majority of learners (59%) at secondary level are having positive attitude towards Science exhibition.

Abdul Berek and Ujjwal Kumar Halder, (2016) investigated the Personality and Attitude towards Science of the secondary students: A Gender Analysis. This study was conducted to explore the relation between personality and attitude towards Science of the students of class X of Bengali medium secondary schools affiliated to the West Bengal Board of Secondary Education in Malda District, West Bengal. The findings of the study are,

- i) There is a positive correlation between personality and attitude towards Science of the students.
- ii) There is a significant difference between the relation between personality and attitude towards Science of male and female students.

OBJECTIVES OF THE STUDY

The primary objective is to study the degree to which the students are favourably or unfavourably disposed towards Science of the Ninth standard when they are taught Science through smart classroom. The secondary objectives are:

- i) To find is there any significant difference between the pre -test and post- test scores on attitude towards Science.
- ii) To find is there any significant difference between the pre - test and post - test scores on attitude towards Science with respect to locality.

- iii) To find is there any significant difference between the pre - test and post - test scores on attitude towards Science with respect to type of family.

HYPOTHESES OF THE STUDY

- i) **H₀: 1** There is no significant difference between the pre -test and post- test scores on attitude towards Science.
- ii) **H₀: 2** There is no significant difference between the pre - test and post - test scores on attitude towards Science with respect to locality.
- iii) **H₀: 3** There is no significant difference between the pre - test and post - test scores on attitude towards Science with respect to type of family.

METHOD AND SAMPLE OF THE STUDY

This investigation is a part of an Experimental Study. The researcher aimed to study the high school students' attitude towards Science. Some selected topics in Science were taught to the students in the smart classroom. This is considered as our experimentation. The data was collected two times from the students. The questionnaire was given to the students before the experimentation. This is considered as pre-test. The same questionnaire was given to the students after the experimentation. This is considered as post-test.

This study is possible only where the smart classroom facility is available. Such a facility is available in Sourashtra Boys Higher Secondary School, Madurai. This is a Government aided school governed by Department of School Education, Tamil Nadu. The sample consists of as many as 35 English Medium students of ninth standard. Random sampling method is adopted in the present study.

TOOL USED FOR THE STUDY

The selection of tool is considered as a significant part of the research. The research findings depend upon the data and the data depends upon the accuracy of the tool. The accuracy of the tool plays vital role in the establishment of validity and estimation of reliability. The tool was developed by Barmby, Kind and Jones (2008). This questionnaire was designed to evaluate student's attitude towards Science. The tool has 37 statements, out of which 32 items are favourably worded and the remaining 5 items are unfavourably worded. Likert's method of summated ratings was adopted to find the level of attitude. The

scale has been constructed by making use of Likert's Method of Summation to get five point judgements on each item.

VALIDITY AND RELIABILITY OF THE TOOL:

The tool used for the study was developed and standardized by **Barmby, Kind and Jones (2008)**. This tool was consulted with experts by the investigator to ensure face validity and content validity. In the present study the reliability of the tool was found to be 0.86 by using split-half technique by the use of Spearman-Brown Prophecy formula.

STATISTICAL TECHNIQUES USED

The present study was concerning to the high school students' attitude towards Science. For analysing and computing the result the investigator used descriptive, percentage analysis and differential statistics.

DATA ANALYSIS AND INTERPRETATION

Table - 1

Table showing the distribution of pre - test and post - test scores on attitude towards Science

Measures	Pre - Test	Post - Test
N	35	35
Mean	136.34	151.02
Std. Error of Mean	2.52	2.66
Median	141.00	153.00
Mode	144.00	164.00
Std. Deviation	14.93	15.79
Variance	222.99	249.38
Skewness	-0.41	-0.67
Kurtosis	-1.07	0.003
Minimum	108.00	112.00
Maximum	157.00	177.00

Interpretation of Pre - Test Scores on Attitude Towards Science

The Pre - Test Scores on attitude towards Science are found to form a normal distribution with a mean of 136.34 whose standard error is found to be 2.52 and the standard

deviation is 14.93. The confidence of the mean gain score lies within the limits of 108 to 157. The median and mode are found to be 141 and 144 respectively.

The co-efficients of skewness and kurtosis are found to be -0.41 and -1.07 respectively. The distribution is negatively skewed and platykurtic. Therefore, the Pre - Test scores on attitude towards Science are slightly amassed at the right end of a leptokurtic curve.

Interpretation of Post - Test Scores on Attitude Towards Science

The Post - Test scores on attitude towards Science are found to form a normal distribution with a mean of 151.02 whose standard error is found to be 2.66 and the standard deviation is 15.79. The confidence of the mean gain score lies within the limits of 112 to 177. The median and mode are found to be 153 and 164 respectively.

The co-efficients of skewness and kurtosis are found to be -0.67 and 0.003 respectively. The distribution is negatively skewed and leptokurtic. Therefore, the Post - Test scores on attitude towards Science are slightly amassed at the right end of a platykurtic curve.

Table - 2

Table showing the level of attitude towards Science at pre-test and post-test.

Attitude towards Science	Level of Attitude				
	Highly Unfavourable	Unfavourable	Neutral	Favourable	Highly Favourable
Pre - Test	0 %	2.86 %	2.86 %	65.71 %	28.57 %
Post - Test	0 %	0 %	0 %	48.57 %	51.43 %

Interpretation:

In the pre-test 2.86 % of students have unfavourable attitude, 2.86 % of students have neutral attitude, 65.71 % of students have favourable attitude and 28.57 % of students have highly favourable attitude towards Science. In the post-test 48.57 % of students have favourable attitude and 51.43 % of students have highly favourable attitude towards Science. It is concluded that the degree of favourableness has increased in the post-test when compared to that of pre-test.

Table - 3

Objective - i) To find is there any significant difference between the pre -test and post- test scores on attitude towards Science.

Hypothesis - i) There is no significant difference between the pre -test and post- test scores on attitude towards Science.

Attitude towards Science	N	Mean	SD	r-value	t-value	Remarks (5% level of significance)
Pre - Test	35	136.34	14.93	0.68	7.07	S
Post - Test	35	151.02	15.79			

S-Significant

Interpretation:

In the above table, the calculated value of 't' (7.07) is greater than the table value (2.00) for df 68, at 0.05 level of significance. Hence, the null hypothesis is rejected. It is concluded that there is a significant difference in the pre - test and post - test scores on attitude towards Science. The mean value of post-test is higher than that of pre-test.

Table - 4

Objective - ii) To find is there any significant difference between the pre - test and post - test scores on attitude towards Science with respect to locality.

Hypothesis - ii) There is no significant difference between the pre - test and post - test scores on attitude towards Science with respect to locality.

Attitude towards Science	Locality	N	Mean	SD	t-value	Remarks (5% level of significance)
Pre - Test	Rural	4	139.00	12.70	0.43	NS
	Urban	31	136.00	15.34		
Post - Test	Rural	4	162.75	11.32	2.09	S
	Urban	31	149.51	15.78		

NS- Not Significant S- Significant

Interpretation:

In the above table, the calculated value of 't' (0.43) is lesser than the table value (2.042) for df 33, at 0.05 level of significance. Hence the null hypothesis is accepted. It is concluded that there is no significant difference between the pre - test scores on attitude towards Science with respect to locality.

But, the calculated value of 't' (2.09) is greater than the table value (2.042) for df 33, at 0.05 level of significance. Hence the null hypothesis is rejected. It is concluded that there is a significant difference between the post - test scores on attitude towards Science with respect to locality. The mean value of the rural students is higher than that of urban students.

Table - 5

Objective - iii) To find is there any significant difference between the pre - test and post - test scores on attitude towards Science with respect to type of family.

Hypothesis - iii) There is no significant difference between the pre - test and post - test scores on attitude towards Science with respect to type of family.

Attitude towards Science	Type of family	N	Mean	SD	t-value	Remarks (5% level of significance)
Pre - Test	Nuclear	29	139.55	13.56	3.45	S
	Joint	6	120.83	11.73		
Post - Test	Nuclear	29	153.96	14.62	2.64	S
	Joint	6	136.83	14.38		

S- Significant

Interpretation:

In the above table, the calculated values of 't' (3.45 and 2.64) are greater than the table value (2.042) for df 33, at 0.05 level of significance. Hence, the null hypothesis is rejected. It is concluded that there is a significant difference between the pre - test and post - test scores on attitude towards Science with respect to type of family. The mean value of the students from nuclear family is higher than that of joint family.

FINDINGS OF THE STUDY

- i) There is a significant difference between the pre-test and the post-test scores of attitude towards Science. The mean value of post-test is higher than that of the pre-test.
- ii) There is no significant difference between the scores of attitude towards Science at the pre-test with respect to locality. But there is a significant difference between the scores of attitude towards Science at the post-test with respect to locality. The mean value of rural students is higher than that of urban students.
- iii) There is a significant difference between the scores of attitude towards Science at the pre-test and post-test with respect to type of family. The mean value of students from nuclear family is higher than that of students from joint family.

5.12 CONCLUSIONS OF THE STUDY

In the light of the important research findings of the study, the researcher has arrived at the following conclusions.

There is a significant difference between the scores of attitude towards Science at the pre-test and post-test. The mean value of post-test is greater than that of pre-test. The students show favourable attitude towards Science at the pre-test level. The degree of favourableness is increased at the post-test level. It is concluded that when students are taught Science through smart classroom the degree of favourableness of attitude towards Science is increased.

5.13 EDUCATIONAL IMPLICATIONS OF THE STUDY

The educational implications are given based on findings and conclusions of the study.

The advancements in Science is very rapid and it brings tremendous changes on the earth. The development of Science and Technology yields positive as well as negative impacts in the society. In this situation, it is essential to develop a favourable attitude

towards Science among school students. It will be helpful to meet out the challenges of Science and Technology.

5.14 SUGGESTIONS FOR FUTURE RESEARCH

By virtue of the experience of this study the researcher would like to put forward the following suggestions for the future study.

- i. The sample size can be enlarged.
- ii. The same study can be conducted for girls also.
- iii. The same study can be conducted for Tamil medium students.
- iv. A similar study can be carried at primary and higher secondary level.

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