

Level of Scientific Attitude among School Students: A Brief Survey

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ABSTRACT

The study was aimed to measure the level of scientific attitude among school students and to find out the significant difference in their level of scientific attitude based on gender as well as age. The scores achieved on the questionnaire give an idea whether the students possess the required scientific attitude to have a bright career in science. It also helped to know whether there is a need to develop this attitude or not? These factors are part of the questionnaire and through the questionnaire the scientific attitude of school students was measured. Survey method was used for the study. A sample of 227 students from a school was used to conduct the survey. Sampling technique used was convenient random sampling. The results showed that there is no significant difference between boys and girls in their level of scientific attitude and also between different age groups.

KEYWORDS: science, attitude, scientific attitude, gender, and age.

INTRODUCTION

The online Cambridge Dictionary defines Science as “(knowledge from) the careful study of the structure and behaviour of the physical world, especially by watching, measuring, and doing experiments, and the development of theories to describe the results of these activities.” (Cambridge Dictionary Online)

The same Cambridge Dictionary gives the meaning of attitude as “a feeling or opinion about something or someone, or a way of behaving that is caused by this”. (Cambridge Dictionary Online)

According to NSSE; “Scientific attitudes 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.” [Krishnamacharyulu, 2011, p.30]

According to another view, scientific attitudes include the following: freedom from bias, prejudice and superstitions, open-mindedness, critical mindedness, intellectual honesty, beliefs when new evidence is available.

Traits of Scientific Attitude:

1. Open-mindedness
 2. Willingness to test and verify conclusions
 3. Faith in cause and effect relationship
 4. Curiosity
 5. Judgement based upon scientific facts alone and
 6. Honest reporting of observation/experiment
- [Krishnamacharyulu, 2011, p.30]

Components of Scientific Attitude: Paul B. Diederich has put forward the following components of scientific attitude.

1. Scepticism
2. Faith in the possibility of solving problem
3. Desire for experimental verification
4. Willingness to change opinion
5. Humility
6. Precision
7. A liking for new things
8. Loyalty to truth
9. Aversion to superstitions
10. Linking for scientific explanation
11. Desire for completeness of knowledge
12. An objective attitude
13. Suspended judgement
14. Awareness of assumptions

15. Distinction between hypothesis and solution,
16. Respect for theoretical statement
17. Respect for qualifications
18. Judgment of what is fundamental and of general significance
19. Acceptance of probabilities and
20. Acceptance of warranted generalisation. [Krishnamacharyulu, 2011, p.30-31]

Scientific attitude scores can be differentiated from the achievement scores in science. While achievement depends on many factors like memory, being healthy, interest, etc., scientific attitude depends on the factors like searching for truth, finding reasons behind each and every process that goes on, inquisitiveness of mind, curiosity, critical thinking, etc.

EARLIER STUDIES ON SCIENTIFIC ATTITUDE

1. In this study (Dr.Rajib Mukhopadhyay, 2014) the researcher has studied some psychometric considerations of scientific attitude. The study explains the terms scientific and attitude in details. Various dimensions of the terms have also been discussed in this study. The study was conducted on secondary school learners. This study also reviewed a tool about its suitability and sound psychometric basis for understanding scientific attitude in much depth.
2. The study presented here is on (Gokul Raj R. and et. al., 2015) on scientific attitude in pre service teachers. A sample of 300 pre service teachers from Erode district of Tamil Nadu was used for the study. The study revealed that there are significant differences in the level of scientific attitude among pre service teachers based on gender and subject group but no significant difference based on locality and age of the students.

NEED FOR THE STUDY

The researcher wanted to study the level of scientific attitude in early adolescents to know about their outlook of the subject science. Their level of attitude towards science as a subject is high or low? The results obtained

will give an idea of their level of scientific attitude and would help teachers, parents or students themselves to either to develop the scientific attitude more or not.

The mobile phone which was earlier available at high cost and very low features is available in affordable amount for all and hence even school children demand their parents for a mobile phone for them. Availability of mobile phones easily distracts the user. Especially children are glued to the games on it. So the researcher wanted to study in amongst all these distractions whether the students are still interested in science? Scientific Attitude in simple terms is attitude towards science subject as a whole. Advancement in technology led to many changes in lifestyle.

Thus the researcher decided to make a research on “A survey on Scientific Attitude among school students of a CBSE School of Mannivakam area of Chennai district, Tamil Nadu”.

OBJECTIVES

1. To measure the level of Scientific Attitude among the school students.
2. To find out the difference in Scientific Attitude based on Gender.
3. To find out the difference in Scientific Attitude based on Age

HYPOTHESES

Ho1: The level of Scientific Attitude is high among the school students.

Ho2: There is no significant difference in the level of Scientific Attitude with respect to gender.

Ho3: There is no significant difference in the level of Scientific Attitude with respect to age.

METHODS AND MATERIALS OF THE STUDY

Sampling Procedure: Convenient Sampling

Sample: A total 227 students from standards VIth , VIIth, VIIIth, IXth of a private CBSE board school were taken for the study.

Method: Survey Method

Tool used for the study: Researcher prepared a questionnaire of 30 statements to measure the

Scientific Attitude among the students. The reliability of the questionnaire was established by test-retest method and validity was established by giving and getting corrections from the field experts. The reliability score for the questionnaire is 0.68.

Scoring and Interpretation of the tool: The response pattern for the tool is of Likert type i.e., two point scale only Yes or No. For positive statements the scoring is Yes=2 and No=1 and reverse in case of negatively worded statements i.e., No=2 and Yes=1.

Data Analysis: 't' test to measure the difference between boys and girls and different ages.

STATISTICAL ANALYSIS

Ho1: The level of Scientific Attitude is high among the school students.

From the table we can conclude that all the students have high level of scientific attitude. Thus, the Null Hypothesis is accepted.

Ho2: There is no significant difference in the level of Scientific Attitude with respect to gender.

The calculated 't' value 1.101 in Table 1 is lesser than table value of 1.96 at 5% level of significance. Thus there is no significant difference between boys and girls in their level of scientific attitude. Null hypothesis is accepted.

Ho3: There is no significant difference in the level of Scientific Attitude with respect to age.

The calculated 't' value 0.103 is lesser than the table value of 1.96 and hence there is no significant difference between the age groups in their level of scientific attitude. Null hypothesis is accepted.

RESULTS AND DISCUSSION

The result from the survey showed that there is a high level of scientific attitude amongst the school children. The survey also brought into the notice that there is no difference between boys and girls in terms of their level of scientific attitude. The other result showed that

there is no difference among the age groups in terms of their level of scientific attitude.

CONCLUSION

It is the attitude which decides the success in a professional or personal life. Scientific Attitude is the attitude which will lay the foundation of science in young learners' minds. When we know that the students have a negative or positive attitude towards a subject as difficult as science in general when compared to other subjects, we can take steps to either promote the positive attitude or curb the negative attitude and convert it into positive so that the future is bright for the students.

RECOMMENDATIONS

- Ways to develop the scientific attitude: the school teachers should be a role model having all the traits discussed above to develop these traits amongst students.
The following ways can be found useful.
- The first way is to make use of wide reading in science, people who read widely in science develop better scientific attitude than others.
- The other is study of superstitions. Indian culture has many beliefs and superstitions. It is an irony for a student of science to believe in science but practising superstitions at home. Hence superstitions should be studied well and found out whether any truth or reality is embedded in them.
- The other ways could be allowing students to question a lot and developing their higher order thinking skills (HOTS). These HOTS questions keep their mind occupied thinking in terms of scientific inquiry. Thus a science teacher can definitely help in developing a right scientific attitude amongst her children. (Krishnamacharyulu, 2011)

LIST OF TABLES

Table 1. The level of scientific attitude among the students.

Level of SA	No. of Students
Low level	-
Average level	1
High level	226
Total	227

Table 2. Difference in the level of SA with respect to gender.

	Gender	N	Mean	Std. Deviation	't' value	Remarks
	BOYS	115	2.0696	.86574	1.101	NS
	GIRLS	112	2.1875	.74170		

Table 3. Difference in the level of SA between age groups.

	AGE	N	Mean	Std. Deviation	't' value	Remarks
	Between 10 and 12yrs	144	2.1319	.76867	0.103	NS
	Between 12 and 14yrs	83	2.1205	.87510		

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