



A Study on Scientific Attitude among Pre Service Teachers

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Abstract

Scientific attitude is open-mindedness, a desire for accurate knowledge, confidence in procedures; seeking knowledge and expectation that solution of the problem will come out through the use of verified knowledge. The teacher bears the responsibility of developing scientific attitude among students. Without scientific attitude aims of science cannot be attained. Scientific attitude, now days, is found to be lacking even in highly educated persons, teachers and students. This is a hindrance in the path of acquiring knowledge. The teachers and students need to have a scientific outlook. This study investigated the scientific attitude among pre service students. The survey research design was used to carry out the study. A sample of 300 pre service students from Erode district of Tamil Nadu. Samples were selected using stratified random sampling technique. In this study the investigator used by the scientific attitude scale was standardized by Sood, J.K. and Sanadhya, R.P.. The collected data were analyzed using the mean, standard deviation and t-test. It was revealed from the study that there are significant differences in the level of scientific attitude among pre service teachers based on gender and subject group of the students and not significantly influenced by locality and age of the students.

Keywords: Scientific attitude, curiosity, superstitions, exaggeration, rationality.

Introduction

Meaning of Science: Fitz Patrick said, "Science is a cumulative and endless series of empirical observations which result in the formation of concepts and theories, with both concepts and theories being subject to modification in the light of further empirical observations. Science is both a body of knowledge and the process of acquiring and refining knowledge"¹.

Scientific attitude: Definition: Scientific attitude 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"².

Scientific attitude are the most important outcomes of science teaching. Though some people view the scientific attitude as the by-product of teaching science, yet a majority of the people consider them as equally important as the knowledge aspect. Science should be taught directly and systematically because developing scientific attitude has a number of characteristics features which distinguish it from other attitudes³.

The characteristics of scientific attitude: A man with scientific attitude has i. is critical in observation and thought, ii. respects other's point of views and is ready to change his decision on presentation of new and convincing evidence, iii. is curious to know more about the things around him wants to know whys, what's and how's of things he observes, iv. does not believe in superstitions and false beliefs⁴, v. suspends judgments until suitable support is obtained, vi. believes in cause and effect relationship, vii. accepts no conclusions as final

or ultimate, viii. seeks to adopt various techniques and procedures to solve the problem and ix. seeks the facts and avoids exaggeration.

How to develop scientific attitude?: The sole responsibility of developing scientific attitude among the students lies on the teacher who can manipulate all the situations to instill in pupils the characteristic features of scientific attitude and at the same time present himself as an example to the students for his intellectual honesty, respect for the other points of views, unbiased and impartial behavior in his dealings and the like. This will create a favourable and permanent impression on the students to adopt the same attitude which their teacher has.

Scientific attitude: Dimension: There are six dimensions of scientific attitude such as, rationality, open mindedness, curiosity, aversion to superstition, objectivity of intellectual beliefs and suspended judgments.

Need for the study: Scientific attitude is considered as an important objective of science learning all over the world. Science education always includes the development of interest, values, attitudes, aptitudes and appreciation. In the present world of science and technology all children should not only possess knowledge of science but also should acquire a favourable attitude towards it and develop interest in it.

It has been also realized that without developing scientific attitude, any amount of knowledge in science contributes, but to national development and to the process of social change. This

is why development of scientific attitude through science lessons has been emphasized by science educators.

Objectives of the study: i. To find out the mean value of scientific attitude of student teachers. ii. To find out if there is any significant different in the level of scientific attitude between male and female students. iii. To find out if there is any significant different in the level of scientific attitude between science and arts group students. iv. To find out if there is any significant different in the level of scientific attitude between rural and urban students. v. To find out if there is any significant different in the level of scientific attitude between age group of below 25 and between 25 – 35 age group students.

Hypotheses of the study: Hypotheses are formulated taking above their objectives into consideration.

The following hypotheses are comes under below, i. There is no significant difference in the level of scientific attitude between male and female students. ii. There is no significant different in the level of scientific attitude between science and arts group students. iii. There is no significant different in the level of scientific attitude between rural and urban students. iv. There is no significant different in the level of scientific attitude between age group of below 25 and age group of 25-35 students.

Methodology

For the purpose of investigation the researcher has followed the normative survey method.

Sample and Sampling technique: Sample consists of 300 pre service teachers distributed evenly from four colleges in Erode district of Tamil Nadu. Samples were selected using stratified random sampling technique.

Description of the tool: The scientific attitude scale was standardized by Sood, J.K and Sanadhya, R.P.³. The tool consists of 36 statements with 18 items are positive statements and another 18 items are negative in nature.

Statistical techniques used: Mean, Standard deviation and t-test are statistical methods were applied to analyses and interpretation of the collected data of the scientific attitude.

Testing of Hypotheses: Hypothesis I: There is no significant different in the level of scientific attitude among gender.

From the table-1 clearly depicts that the calculated t value is greater than the Table value. Hence, there is significant difference between male and female pre service teachers in their level of scientific attitude, with the female pre service teachers having a higher mean value than the male pre service teachers. Hence the null hypothesis is rejected.

Table-1
 Showing the difference in the level of scientific attitude among gender

Gender	No	Mean	SD	DF	t value	Level of significance
Male	62	83.06	12.71	298	2.126	Significant at 0.05 level
Female	238	85.32	10.54			

Hypothesis II: There is no significant different in the level of scientific attitude among subject group of the students.

Table-2
 Showing the difference in the level of scientific attitude among subject group of the students

Subject group	No	Mean	SD	DF	t value	Level of significance
Science	125	86.38	10.36	298	2.788	Significant at 0.01 level
Arts	175	83.77	11.40			

From the table-2 clearly depicts that the calculated t value is greater than the table value. Hence, there is significant difference between subjects group of the science and arts pre service teachers in their level of scientific attitude, with the science group of the pre service teachers having a higher mean value than the arts group of the pre service teachers. Hence the null hypothesis is rejected.

Hypothesis III: There is no significant different in the level of scientific attitude among locality.

Table-3
 Showing the difference in the level of scientific attitude among locality

Locality	No	Mean	SD	DF	t value	Level of significance
Rural	178	84.76	10.75	298	0.953	Not significant
Urban	122	85.00	11.49			

From the table-3 clearly depicts that the calculated t value is less than the table value. Hence, there is no significant difference between the locality of rural and urban pre service teachers in their level of scientific attitude. Hence the null hypothesis is accepted.

Hypothesis IV: There is no significant different in the level of scientific attitude among age group students.

Table-4
Showing the difference in the level of scientific attitude among age group students

Age group	No	Mean	SD	DF	t value	Level of significance
Below 25	162	84.80	11.17	298	0.918	Not significant
Between 25-35	138	84.93	10.92			

From the table-4 clearly depicts that the calculated t value is less than the table value. Hence, there is no significant difference between the age group of below 25 and between 25- 35 pre service teachers in their level of scientific attitude. Hence the null hypothesis is accepted.

Results and Discussion

Major findings of the study: i. There is significant difference between male and female pre service teachers in their levels of scientific attitude. ii. There is significant difference between subjects group of the science and arts group pre service teachers in their levels of scientific attitude. iii. There exists no significant difference between the locality of rural and urban pre service teachers in their level of scientific attitude. iv. There exists no significant difference between the age group of below 25 and between 25- 35 pre service teachers in their level of scientific attitude.

Recommendations of the study: i. Science education has become a part and portion of human life without which one cannot live comfortably. Identifying the multifarious values of science education, it should be included in the curriculum as a compulsory subject. ii. Scientific attitude is necessary to an individual to lead a smooth and live comfortable life in the society. An individual with good scientific attitude can understand the phenomena of nature and human behavior and accordingly in their own family as well as in the society in which they lives. iii. The scientific attitude also plays a major role in molding a child's character and in selecting a career deciding course for this life. The facilities like library, laboratory, audio- visual aids and exposure to eminent personalities, participation in fairs, exhibitions' etc., will help in the inculcation and promotion of scientific attitude in the individuals. iv. Another important significant feature is the possessions of scientific attitude by the teachers who teach it has influence directly or indirectly in the classrooms. A teacher without proper scientific attitude cannot develop or promote it. Now it is the right time for the identification of necessary factors for the promotion of scientific attitude in B.Ed., colleges.

Conclusion

Scientific attitude of teachers, teacher educators as well as of pupil teachers must be tested and the weaker dimension of scientific attitude must be identified. The investigators, during the study, observed variations in scientific attitude among pupil teachers of arts, and science streams. The investigators suggest that a common general science curriculum based on scientific lines must be compulsory even at higher levels of study and training as it will contribute to the development of scientific attitude. The emphasis on liberal arts education affects the progress of learners as it does not facilitates the learners to avail proper place in present scientific and technology driven world.

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