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A Study on the Scientific Attitude of Secondary School Students in Mokokchung District, Nagaland

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Abstract

This study was done to assess the scientific attitude of secondary school students in Mokokchung District, Nagaland, as no study has been previously conducted in this district. A sample of 105 students (49 from private and 56 from government schools) was selected using purposive sampling method. For data collection, the Scientific Attitude Scale (SAS) designed by Dr. Sukhwant Bajwa and Monika Mahajan was used. The study found that secondary students possessed low level of scientific attitude. Moreover, students from private secondary schools exhibited greater scientific attitude compared to students from government secondary schools. Students from urban schools also showed significant difference in scientific attitude in comparison to rural schools.

Keywords: Scientific attitude, Secondary School

1. Introduction

In this rapid age of science and technology, study of science as a school subject has become an essential part of the school system to understand the various phenomenon in our daily lives. Science and its applications are now fundamental to our daily existence, permeating modern life to the extent that it is impossible to eliminate the products of science. The teaching and learning of science not only involve acquiring knowledge of scientific terms, principles, and concepts but also include understanding and using this knowledge to address various real-life situations and problems. Moreover, students should develop a scientific attitude towards life's challenges and appreciate the importance of science in human progress. An important objective of science teaching and learning at the secondary stage is the development of scientific attitude. Generally, we tend to associate scientific attitude with scientists only, however the various aspects of scientific attitudes need to be developed for a progressive society.

Attitude refers to an individual's mental disposition or outlook towards any objects or situation. Scientific attitudes refer to a person's mindset and approach towards objects or situation from a scientific perspective. In other words, a person having scientific attitude is characterized by qualities such as having a rational thought process, accepting evidence-based information, thinking logically, devoid of superstitious believes, open mindedness, curiosity, productive imagination, judgement based on scientific evidence and many more. Science learners tend to act based on their scientific beliefs, influenced by their feelings and opinions. According to Rao (1996), scientific attitudes drive the motivation to apply knowledge of scientific facts and the skills of working with scientific methods,

utilizing scientific procedures throughout one's life. Hence it is imperative that science teaching and learning should inculcate a high level of scientific attitude among students.

1.1. Need and Significance of the Study:

Secondary education plays a crucial role in shaping students' future career choices as it introduces students to the world of work. Many students aspire to become doctors or engineers upon entering school, but their interest and dislike for science subjects often decline as they progress through higher levels of study. Despite efforts to boost interest in science, it is a pertinent issue that science is still considered as a difficult subject best suited for bright students only and hence students opting for science careers remain low in comparison to other field of study. Many parents encourage their children to pursue science study, believing that science majors offer higher incomes, better employment opportunities, and thus improved future livelihoods without considering the interests of their children. Moreover, researchers have also shown that the level of achievement in science is correlated to the level of scientific attitude possessed by the students. There have also been studies that have shown gender biases towards the subject of science. It is therefore of paramount interest to undertake this study to determine the scientific attitude of the students.

Although students of the same age group generally exhibit similar intellectual abilities, their attitudes toward science can vary significantly. However, most students and parents are unaware of the importance of cultivating a strong scientific attitude for success in the field of science. This study aims to analyse the general attitude toward science among high school students and identify the reasons behind issues related to their attitudes.

1.2. Review of Related Literature:

Srivastva (2004) in his study of the Learning Style of Secondary School Students with Scientific Attitude and their Achievement in Science found that private schools boys possessed greater scientific attitude than those of government schools.

Kaur, K. (2005) in his Study of the Scientific Attitude of Adolescents in Relation to Sex, Faculty and Rural- Urban areas revealed that there is a significant difference in the scientific attitude of adolescents from urban and rural areas.

Patil, G.S. (2008) in his study on the scientific attitude of Secondary School Students from a Rural area found that girls had more favourable attitudes towards science than boys.

Uplane, M.M. (2011) in her study on 'The Scientific Attitude among Senior Secondary School Students' found significant differences in scientific attitude among senior secondary school students.

Chakraborty, Sudipta and, Gogoi, Manashee (2014) in their study on Scientific Attitude of Secondary School Students found no significant difference in the scientific attitude of boys and girls of Dibrugarh District. However, a significant difference was found between urban and rural students.

Rai, Rakesh, and Yashu, Visiezolie (2016) in their study of attitude toward scientific interest among the tribal students at the secondary level in Kohima, found that tribal students of private secondary schools have more in relation to their scientific interest and curiosity in comparison to tribal students of Government secondary schools.

Revati, N. & Meera, K.P. (2017) in their investigation of Scientific Attitude among Secondary School Students in the Kottayam District of Kerala found that there is no significant difference in the scientific attitude of secondary school students based on gender, type of management and locale of school.

Bai, C. Arundhathi and Singh, Y. Chakhradhara (2017) in their study of the scientific attitude of secondary school students in the west Tripura district found no significant difference between the levels of scientific attitude possessed by boys and girls.

D Sofiani, D., Maulida, A. S. Fadhillah, N and Sihite, D.Y (2017) in their study on "Students' attitude towards science and the effect of gender on students' attitude", found that students' positive attitude towards science was at medium level and there was no significant difference in attitude towards science between the female and male students.

1.3 Operational definitions of the terms used:

Secondary Level: Refers to students from both classes 9 and 10.
Type of School: Refers to Government or Private School
Locality: Refers to rural or urban
Rural Area: Rural area means the village which is governed by the village council.
Urban Area: Urban area means the area that is governed by the Municipal Council.
Gender: In this study, gender refers to male and female students.

1.4 Objectives

- To find the level of Scientific Attitude possessed by Secondary School Students.
- To study the Scientific Attitude of Secondary School Students based on the Type of Management of School.
- To study the Scientific Attitude of Secondary School Students based on Locality of the school.
- To study the Scientific Attitude of Secondary School Students based on Gender.

1.5 Hypotheses:

H_{01}: There is no significant difference between Students of Government and Private Secondary Schools in relation to Scientific Attitude.
H_{02}: There is no significant difference between Students of Urban and Rural Secondary Schools in relation to scientific attitude.
H_{03}: There is no significant difference between Male and Female Students of Secondary School in relation to scientific attitude.

1.6. Delimitations:

The study was delimited to 105 students from Secondary Schools in Mokokchung District, Nagaland.

2. Methodology: Descriptive survey method was adopted to analyse the Scientific Attitude of the Students.

2.1. Population: The population consists entire students from different Secondary Schools in Mokokchung District, Nagaland.

2.2. SAMPLE

Purposive Sampling Technique was applied to select 105 samples from both government and private as well as rural and urban schools of Mokokchung district.

2.3. TOOL

The investigator used the tool of Scientific Attitude Scale (SAS) designed by Dr. Sukhwant Bajwa and Monika Mahajan to collect the required information.

3. ANALYSIS OF DATA

The Level of Scientific attitude was calculated using mean score.

Table 3.1: Level of Scientific Attitude

Sample Size	Mean Score	Standard Deviation
105	154.24	10.18

From Table 3.1 it was found that students studying in secondary schools hold a Low level of scientific attitude. From the sample, as per the standard deviation, there is a little bit of a higher dispersion of scores in the units of the sample.

The collected data was statistically analysed by applying t-test. The results were reflected in tabular form as:

Table: 3.2 Comparison of the Scientific Attitude of Secondary School Students based on the Type of Management of School

Type of School	No.	Mean	S. D	t-value	Significance
Govt.	49	152.27	9.84	2.0052	**Significant at .05 level**
Private	56	156.21	10.22		

When the differences in means were tested for significance, we get a t- value of 2.0052 which is greater than the tabulated value for .05 levels of significance. Hence, we reject the null hypothesis and infer that there is statistically significant difference in the Scientific Attitude of secondary school students based on the type of Management of the school i.e. Government and Private.

Table:3.3 Comparison of the Scientific Attitude of Secondary School Students based on the Locality of the School

. Locality	No.	Mean	S. D	t-value	Significance
Urban	55	156.33	11.28	2.4733	**Significant at .05 level**
Rural	50	151.42	8.76		

When the differences in means were tested for significance, we get a t- value of 2.4733 which is greater than the tabulated values for .05 levels of significance. Hence, it is inferred that there is statistically significant difference in the Scientific Attitude of secondary school students based on the Locality of the school i.e. Urban and Rural.

Table 3.4 Comparison of the Scientific Attitude of Secondary School Students based on Gender

Gender	No.	Mean	S. D	t-value	Significance
Male	57	153.14	10.57	1.4145	**Not**

Female	48	155.94	9.52		**Significant**

When the differences in means were tested for significance, we get a t- value of 1.4145 which is less than the tabulated values for .05 levels of significance. Hence, it is inferred that there is no significant difference in the Scientific Attitude of secondary school students based on Gender.

4. Findings of the Study:

1. The level of scientific attitude possessed by Secondary School Students is Low.
2. There exists a statistically significant difference in the scientific attitude of students according to the type of management of schools i.e., Private and Government.
3. There exists a statistically significant difference in the scientific attitude of the students according to the locality of the schools i.e., Rural and Urban
4. There exists no significant difference in the level of scientific attitude between Male and Female Students.

5. Conclusion:

This study shows that there is a significant difference in the Scientific Attitudes of high school students regarding the type of School Management. This can be attributed to poor science foundations of students passing primary classes from Government schools where rote memorization is still very much the process of study. This study also shows that urban students are significantly different from rural students in terms of Scientific Attitudes. Findings of the study reveals that urban students are more rational, open minded, curious and have a strong disclination towards superstitious beliefs in comparison to students from rural areas. Regarding student gender, the study also found that there was no significant difference between male and female junior high school students in terms of attitudes towards science. This finding is of great importance to science teachers and to parents and guardians who hesitate while choosing science as a field of research and career for their girl child. This study highlights the importance of adopting a gender-neutral perspective towards the teaching-learning of science.

6. Suggestions for improvement of Scientific Attitude:

Inevitably, an important goal of science education is the development of the student`s scientific attitude and temperament. Students participate in science-related extracurricular activities such as providing appropriate laboratories, providing quality science textbooks, organizing science clubs, and creating science models to raise the average level of students' scientific attitudes. However, many of these activities are being conducted without clear objectives or goals hence failing to achieve the purpose intended for. Moreover, a balance has to be maintained between religious beliefs and scientific enterprise which can often be contradictory to each other. Teachers need to be aware that they play an important role in developing a student's scientific attitude. This includes providing schools with the infrastructure materials needed to set up and maintain a well-equipped scientific laboratory, funding students to participate in field trips, providing opportunities for challenging students' pre-existing thoughts and more. All these steps taken will greatly help promote the development of the scientific attitude of secondary school students.

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