



Research Paper

A Comparison Study on Attitude Towards Science Among Higher Secondary School Students in Aizawl

R.Lalhmingangi

Abstract

Science is information acquired by study or practice, or knowledge that covers broad facts about the operation of general laws as discovered and verified through the scientific process, and is concerned with the physical world. It refers to a method of acquiring information. Observation and experimentation are used to describe and explain natural events in this system of thinking. The psychological foundation for attitudes, their permanency, their learnt nature, and their evaluative character all fall under the category of attitude. Objects, things, people, locations, ideas, or circumstances are all included in this category. The value of a job in science is increasingly seen as greater than the value of a career in any other field, making it a good choice for pupils. As the driving force behind our nation's technological and industrial advancement, science is critical in refining our critical thinking and reasoning abilities. As a result, this study is aimed at determining whether or not students in upper secondary schools have developed positive attitudes toward science as a discipline and for the advancement of science in education. The survey approach is utilised to examine folk's attitudes toward science, and Dr.(Mrs.) Avinash Grewal's Science Attitude Scale was used in this study. Aizawl's public and private high school students in the arts, commerce, and science streams make up the study's 180 participants. According to the findings in this report, many students have a positive view of science. According to comparisons of attitudes toward science at Aizawl's higher secondary schools, students exhibit an average interest in science. The study also reveals that commerce students are assumed to be less interested in the pursuits of Science subject. From the different attitude of students towards science, it can be known that science is important and useful for day to day life and development of human beings.

Keywords: Science, Attitudes, Higher Secondary Schools.

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I. INTRODUCTION

As the Latin term "Scientia" suggests, the word science is derived from the concepts of knowledge, expertise, and experience. As defined by Webster's New Collegiate Dictionary, 'Science is a branch of knowledge that deals with the physical universe.' It refers to the method of studying. Observation and experimentation are used to describe and explain natural events in this system of thinking. Using that framework, individuals have amassed a body of knowledge that is referred to as "science." When referred to the application of research to human needs, pure science is sometimes referred to as applied science. If facts are like stones, then science is nothing more than a stack according to Henri Poincare: "Science is nothing more than a pile of stones."

The psychological foundation for attitudes, their permanence, their learnt nature, and their evaluative character all fall under the category of attitude. Everything from individuals and places to ideas and circumstances is included. Rather of being a passive outcome of experience, one's attitudes drive one's behaviour and direct one's appearance and attitude. People, things, events, actions, and ideas may all be the subject of one's attitude. Anything from a specific object to an abstract concept may be addressed. Attitude is defined by Eagly and Chaiken (1998) as the psychological tendency to judge a certain entity with some favour or dislike. Thurstone (1948) defined attitude as the degree to which a psychological item has a positive or negative influence on a person.

The components of attitudes are as follows:

1. A cognitive component: A deliberate belief or opinion held by an individual (opinion information or strength of belief or disbelief).
2. An affective component: This has something to do with the individual experience of emotion. (an emotional element of like and dislike).

3. A course of action (co nature behavioural component of habit or readiness to respond).

NEEDS AND IMPORTANCE OF THE STUDY

Attitudes test is highly needed in the field of a higher level of education, this is because by using this test it can be able to identify the interest and ability of students towards the certain subject and therefore preparing him to meet achievement in his studies as per his attitudes and abilities. The value of a career in science is generally seen as higher than the value of a career in any other field, making it a good choice for students. Education in the sciences is essential in the development of critical reasoning and logical thinking skills, as well as for the advancement of technology and the business. Science subject is useful for our daily life and open up many avenues of employment and turned the impossibilities into possibilities. As a result, it is critical to examine how high school students feel about science and whether or not they have developed positive attitudes toward science as a discipline, in order to aid in the advancement of science in education. In India, there is a paucity of commercially available science attitude scales that may be used by teachers and researchers alike. This is why it was deemed necessary to create an accurate scale for gauging students' attitudes about science. Educators have the duty of establishing a positive view of science in the minds of the students.

STATEMENT OF THE PROBLEM

'A Comparison Study on Attitude Towards Science Among Different Streams of Higher Secondary School Students in Aizawl ' is the study's subject.'

OPERATIONAL DEFINITION OF KEYWORDS

Terms used in this research have been defined as follows:

1. **Science:** Understanding the natural world through experimentation and careful observation is just what we understand by the word "science."
2. **Attitude:** As a result of this, one develops an attitude or belief about someone or something.
3. **Higher secondary school:** Higher secondary school is the educational level of standard 11 and 12 which includes various streams like arts, science, commerce, etc.

OBJECTIVES

The objectives of the present study are as follows:

1. To find out if there is a gender gap in Aizawl's higher secondary school students' attitudes toward science.
2. To compare the attitude toward science in Aizawl's higher secondary school students between the public and private schools..
3. To find out if there was a significant shift in attitudes toward science among higher secondary school students in the arts, science, and commerce streams in Aizawl.

HYPOTHESIS

1. There is no major gender disparity in students' attitudes about science at the higher secondary school level.
2. There is no substantial difference in attitudes toward science between pupils in government and private schools.
3. Students in all three higher secondary school disciplines (arts, commerce, and science) have the same attitude toward science.

DELIMITATION OF THE STUDY

The investigator takes statements for the present study from male and female students of higher secondary schools studying in government and private schools. The study is confined to 180 Class-XII students out of which 90 are boys and 90 girls,90 from government schools and 90 from private schools,60 students from arts,60 from science, and 60 from commerce. The investigator can collect data only from Class-XII students because only the students who are going to face board examinations attend class due to the pandemic.

II. REVIEW OF RELATED LITERATURE

STUDIES RELATED TO SCIENCE ATTITUDE SCALE

- 1.** Gender, grade level, and academic success were all taken into account in a research by Akpinar. et al. (2009), which found that female students were more interested in science than their male colleagues, regardless of their gender. In terms of "enjoyment of science" and "anxiety," however, there were no significant gender differences in these other characteristics. In terms of four characteristics, pupils' grade levels were significantly different in their attitude about science and technology. In addition, ASST and academic success showed significant favourable associations.
- 2.** An investigation on college student teachers' views on science by Prakash & Xavier (2020) found no significant differences between urban and rural student teachers' viewpoints on the topic. However, rural college student instructors lack personal confidence in the subject matter, interest with the subject, usefulness of the subject material, impression of the teacher's attitude, and attitude toward science in total.
- 3.** According to research done by Nambikkai & Manoharan (2014), there is no substantial difference between male and female secondary school pupils when it comes to their attitude toward science. Students' opinions about science in rural and urban high schools are almost identical. In terms of scientific perspective, dads' educational backgrounds don't differ much. When it comes to their scientific outlook, dads' money makes no difference. When it comes to a religion's approach to science, there was not much of a difference. Learning by doing and theoretical learning in secondary school are examined in this study.
- 4.** Lalmuanzuali. et. al. (2019) conducted a study on 'Science Achievement and Attitude toward Science among Higher Secondary School Students of Aizawl City,' and found that while there was no significant difference in attitude toward science by gender, boys had significantly higher science achievement than girls, and there was no significant correlation between attitude toward science and science achievement.

III. METHODOLOGY

This chapter presents the methods and tools for collecting and analysis. The success of any study depends upon the methodology and procedure followed step-wise execution of the study.

METHOD OF STUDY

For the present study survey method is used.

POPULATION

Students from Aizawl City's public and private higher secondary schools make up the majority of the population.

SAMPLE

The investigator has selected 180 higher secondary school students out of which 90 are boys and 90 are girls studying in Class-XII from the government and private schools in Aizawl city. 60 students from the Arts stream, 60 students from Science, and 60 students from Commerce. The sampling technique used is stratified random sampling.

SCORING PROCEDURE :

From 4 (Strongly Agree) to 0 (Strongly Disagree), the scale weighs the ten affirmative statements (S.Nos. 2, 4, 6, 8, 10, 12, 14, 16, 18, and 20). (Strongly Disagree). Ten negative items (S.Nos.1,3,5, 7, 9,11,13,15,17,19) are rated from zero (Strongly Agree) to four on a scale of zero to four (Strongly Disagree). The sum of a subject's scores on each of the scale's twenty elements reflects the subject's overall attitude. The sum of a student's individual scores for each item yields a total score on the scale. As a result, a student is limited to a maximum score of 80. It was found that results varied from 25 to 70 on the exam, which has been given.

TOOLS USED

Dr.(Mrs.) Avinash Grewal, a lecturer in education at the regional college of education, Bhopal, created the Science Attitude Scale for use in this study.

COLLECTION OF DATA:

For collecting data, the investigator personally visited the schools selected for the study, and the following instructions were given to the subject for administration and collection of data:

"The following are some statements about science." The following statements may characterise your approach toward science. Please provide feedback about science as a study subject with all of us. Some of these statements may connect with you, while others may not. Decide if you agree or disagree with a statement after thoroughly reading it. In order to show your level of agreement with the statement, draw a circle around the phrase (Strongly Agree), an A for agreement, a U for uncertainty, and a D for disapproval. If you highly disagree, draw another circle around the word (Disagree), and a S for strongly disapproval (SD). You've been asked to express an unvarnished opinion."

A systematic procedure was followed to collect the necessary data or information.

Before distributing the questionnaire to the students, the investigator first introduced herself, and necessary rapport was established with them. Then she explains to them the objectives and importance of the study. Necessary clarification was also made to them. When the subjects were found to be clear about every aspect of the instruments and how to answer the questions, the test material was distributed to them. They were requested to go through the questionnaire and answer all the items. Any expression of doubt and difficulty was also taken care of by the investigator. The material was collected back from the students after they finished answering them. The data so obtained was analyzed properly.

RELIABILITY:

The split-half (0.86) and test-retest (0.75) approaches were used to assess the Science Attitude Scale's reliability, and both came up with good results.

VALIDITY:

According on the process of item selection, the Science Attitude Scale appears to be content valid.

ANALYSIS AND INTERPRETATION OF DATA

Hypothesis 1: Students in the upper secondary grades show no discernible differences in their attitudes about science based on gender.

Table no.1: Boys and Girls higher secondary school differ in overall attitude toward science.

VARIABLE		N	MEAN	SD	Critical Ratio	Significant level
GENDER	BOYS	90	43.62	5.48	0.72	No significant
	GIRLS	90	44.17	4.76		

It is clear from Table 1 that the critical ratio (0.72) is less than the t-value (1.99) at the significance level of 0.05. There are no substantial gender differences in students' attitudes toward science in higher secondary schools, hence the hypothesis is accepted.

Hypothesis 2: Higher secondary school students' attitudes regarding science are not significantly different between government and private schools.

Table no 2: The effect of different management styles on students' attitudes toward science learning in higher secondary school

VARIABLE		N	MEAN	SD	Critical Ratio	Significant level
TYPES OF MANAGEMENT	PUBLIC	90	44.08	5.15	0.48	No significant
	PRIVATE	90	43.71	5.34		

A comparison of the critical ratio (0.48) to the t-value (1.98) at the 0.05 level can be seen in table 2. There is no evidence supporting the premise that there is a difference between public and private science attitudes among higher secondary school students.

Hypothesis 3: There is no substantial variation in students' attitudes about science across students from different streams (arts, commerce, and science).

Table no 3: Science and the arts, science and commerce, and commerce and arts all have an impact on students' attitudes about science in higher secondary school.

Stream of subject	N	Mean	SD	Critical Ratio	Significant level
ARTS	60	43.23	4.86	2.60	0.05
SCIENCE	60	45.63	5.30		
SCIENCE	60	45.63	5.30	2.94	0.05
COMMERCE	60	42.83	5.20		
COMMERCE	60	42.83	5.20	0.43	No significant
ARTS	60	43.23	4.86		

There is a critical ratio of 2.60, which is more than the t-value of 2.00 for Table 3 at the 0.05 level, as shown by the calculations in Table 3. Thus, the premise that there is a significant difference between Science and the Arts has been proven to be incorrect.

It's clear that there's a big difference between Science and Business because their critical ratios are both 2.94, which is higher than the table's t-value of 2.00, which means the hypothesis is rejected. The critical ratio from Commerce and Arts is 0.43 which is less than the table t-value of 2.00 at the 0.05 level. For this, the hypothesis that there is no significant difference in the attitude of Aizawl's higher secondary school students toward science has been accepted and verified.

IV. MAJOR FINDINGS

The following are some of the study's most important findings, as drawn from its data and research:

1. There is no noticeable difference in the attitudes of boys and girls towards science. In fact, the mean value of girls is larger than that of boys, although this might be due to chance.
2. According to the findings, there is no noticeable difference in students' attitude towards science between public and private higher secondary schools. But the mean value of public schools is higher than that of private schools, but this can be due to chance factor. As a result, it may be claimed that students in both private and public high schools follow a common view of science.
3. Studies of several higher secondary school streams in Aizawl reveal that the arts and sciences, as well as commerce and science, vary dramatically, but the arts and commerce really don't. According the mean value, science students got the highest and commerce students the lowest. So it can be assumed that Commerce students are generally less interested in Science.

V. DISCUSSION:

An analysis of student attitudes toward learning in higher secondary schools in Aizawl found that interest in science among students was on the average. Even still, scientific instruction is far behind in other states. It's unusual to find a higher secondary schools in Mizoram that provides a Science Stream as an alternative. They exhibit minimal interest in science and have a neutral or positive view of it. The reasons can be due to lack of instructional facilities and lack of trained teachers, lack of high equipment in the science laboratory, and inadequate curricula. So for the improvement of science and for upgrading positive attitudes towards students, rich and diverse methods should be adopted to make sure a high-quality, effective learning experience for the students. Activity related to scientific skills should be imparted. Students should be made known the importance of science and should be motivated to enjoy science. Students from various streams should be imparted the knowledge of science and realize its importance since most high-level jobs required a basic to intermediate level of scientific knowledge. Practical activities with trained teachers along with high technological equipment would make science more interesting. Since science is important for day to day living, positive attitude towards science should be inculcated by parents and teachers at all levels of education.

VI. RECOMMENDATIONS:

Based on the findings of the present study, some recommendations are given below which may be helpful for further research and improving science attitudes among higher secondary school students:

1. The study has to be replicated on a larger sample of students from various levels of education and academic streams from multiple institutions in order to draw accurate conclusions.
2. Comparative research may be achieved by drawing sample both from high school and college school students.
3. Aizawl was the sole district studied by the investigator. Similar studies can be carried out in other areas of the state and in other nations.
4. The pattern of questions can include subjective type questions to spring out different attitudes of the students.
5. The findings of such a study could help in better understanding the students' attitudes regarding science learning and predict their science-related behaviors.

VII. CONCLUSIONS

The study reveals that a larger number of students have favorable attitudes toward science as compared to students who have an unfavorable attitude toward science. Only a few students have extremely favorable attitude towards science. Students at public and private higher secondary schools share the same views on science, as can be seen. No gender disparity can be seen in higher secondary school science students' attitudes, according to the results of a research. Commerce students are found to have low mean value of attitude towards science and science students have the highest mean value of when it comes to the attitudes toward science. From the different attitudes of students towards science, it can be known that science is an important and useful subject that is needed for day to day life and the development of human beings. Some students have negative attitude towards science due to low standards of the educational system, differences in abilities of individual and lack of opportunity . Many students tends to take other subjects due to the complexity of science. Higher secondary school students should be encouraged to develop a favorable attitude toward science by increasing educational standards.

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