Abstract

Scientific attitude is a cognitive concept and is a composite of a number of mental habits or tendencies to react consistently in certain way to a novel or problematic situation. These habits or tendencies include accuracy, intellectual honesty, open mindedness, suspended judgment, criticalness, and habit of looking for the cause and effect relationships. These habits are important for everyone in everyday life. Scientific attitude is necessary to an individual to lead a smooth and comfortable life in the society. An individual with good scientific attitude can understand the phenomena of nature and human behavior. To develop scientific attitude among students, they should be made to practice and observe science so that they get the opportunity to feel and develop the components of scientific attitude in their minds. In this context “A Study of Scientific Attitude of Secondary School Students in West Tripura District” was conducted to measure scientific attitude. For this purpose Descriptive survey method of research was used. A sample of 110 secondary school students were selected randomly from seven schools located in West Tripura district. The methodology includes ‘t’ test.

I. INTRODUCTION

Science has its significant role in promoting quality of life either directly or indirectly. Science not only satisfies the usual needs for its inclusion as a subject in the curriculum – such as intellectual, cultural, moral, aesthetic, utilitarian as well as vocational values, science learning provides training in scientific method and also helps to develop a scientific
attitude of mind in the learner. The acquisition of the knowledge of scientific terms, principles and concepts, a clear understanding of them, the ability to use such knowledge in different situations in the life and in the development of skills should be the outcomes of teaching and learning of science. Moreover, the students should develop a proper attitude towards the study of science, besides appreciating the importance of science in human life and civilization. It also helps to improve their abilities and capacities in science.

Scientific attitude is the most important outcome of science teaching. The scientific attitude is really a composite of a number of mental habits or of tendencies to react consistently in certain ways to a novel or problematic situations. These habits or tendencies include accuracy, intellectual honesty, open-mindedness, suspended judgment, criticalness and a habit of looking for the cause and effect relationship. It is a cognitive concept. Scientific attitude is also a complex behavioural aspect of science having so many characteristics and it can be attributed to many situations. Scientific attitudes are normally associated with the mental process of scientists. These habits are important in the everyday life and thinking not only for the scientist but for everyone.

To develop scientific attitude, the teachers should always remember that without a questioning mind and a spirit of enquiry, studies in science will only mean acceptance of dogma and will never lead to development of scientific attitude in the learners. The students should be made to practice and observe science so that they get the opportunity to feel and develop the components of scientific attitude in their minds. Hence there is a felt need to study scientific attitude of secondary school students. The present work, “A Study of Scientific Attitude of Secondary School Students in West Tripura District” was intended to measure scientific attitude.

The Scientific Attitude Scale consists of six dimensions: rationality, curiosity, open-mindedness, aversion to superstitions, objectivity of intellectual beliefs and suspended judgment. They are as follows:

**1: Rationality**
(a) Commitment of the value of rationality.
(b) Tendency to test traditional beliefs.
(c) Seeking for natural cause of events and identification of cause and effect relationship.
(d) Acceptance of criticalness.
(e) Challenge of authority.

**2 : Curiosity**
(a) Desire for understanding new situations that are not explained by the existing body of knowledge.
(b) Seeking to find out the ‘why’ and ‘how’ of observed phenomena.
(c) Giving emphasis on the question in approach for novel situation.
(d) Desire for completeness of knowledge.

**3 : Open-mindedness**
(a) Willingness to revise opinions and conclusions.
(b) Desire for new things and ideas.
(c) Rejection of singular and rigid approach to people, things and ideas.

4: Aversion to superstitions
(a) Rejection of superstitions and false beliefs.
(b) Acceptance of scientific facts and explanation.

5: Objectivity of Intellectual Beliefs
(a) Demonstration of the greatest possible concern for observing and recording facts without any influence of personal pride, bias or ambition.
(b) Not allowing any change in interpreting results on the basis of present social, economic or political influences.

6: Suspended judgment
(a) Unwillingness to draw inferences before evidence is collected.
(b) Unwillingness to accept facts that are not supported by the convincing proof.
(c) Avoidance of quick judgment.

II. OBJECTIVES OF THE STUDY

1. To find out the level of scientific attitude possessed by the secondary school students.
2. To find out the influence of following variables on scientific attitude of secondary school students.
   a) Gender          b) Type of school           c) Residence             d) Medium of instruction

III. HYPOTHESIS

1. There is no significant difference in scientific attitude of boys and girls of secondary schools.
2. There is no significant difference in scientific attitude of private and government secondary school students.
3. There is no significant difference in scientific attitude of urban and rural secondary school students.
4. There is no significant difference in scientific attitude of Bengali medium and English medium secondary school students.

IV. DESIGN AND METHODOLOGY

Descriptive survey method of research was employed for the present study. A sample of 110 students of IX standard was selected randomly from seven schools of West Tripura District. Sample was collected from government, and private schools consisting of boys and girls of rural and urban areas.

4.1. Sample Design

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Name of the School</th>
<th>No. of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Berimura Higher Secondary School</td>
<td>7 BOYS, 7 GIRLS</td>
</tr>
<tr>
<td>2</td>
<td>Lembucherra High School</td>
<td>8 BOYS, 6 GIRLS</td>
</tr>
</tbody>
</table>
4.2. Tools
Among the tools developed in India, the Scientific Attitude Scale developed by J.K. Sood and R.P. Sandhya was finalized for the final administration to measure the scientific attitude of secondary school students. Scientific Attitude Scale contained 36 statements of which 18 were of positive polarity and 18 were of negative polarity. The distribution of items was as follows:

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Negative Polarity (Item Numbers)</th>
<th>Positive Polarity (Item Numbers)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Rationality</td>
<td>1, 2, 6</td>
<td>3, 4, 5</td>
</tr>
<tr>
<td>2. Curiosity</td>
<td>8, 9</td>
<td>7, 10, 11, 12</td>
</tr>
<tr>
<td>3. Open-Mindedness</td>
<td>13, 14</td>
<td>15, 16, 17, 18</td>
</tr>
<tr>
<td>4. Aversion to superstitions</td>
<td>19, 21, 24</td>
<td>20, 22, 23</td>
</tr>
<tr>
<td>5. Objectivity of intellectual beliefs</td>
<td>25, 26, 28, 30</td>
<td>27, 29</td>
</tr>
<tr>
<td>6. Suspended judgment</td>
<td>31, 32, 34, 35</td>
<td>33, 36</td>
</tr>
</tbody>
</table>

4.3 Statistical Analysis
The data was analyzed using ‘t’ test.

V. ANALYSIS AND INTERPRETATION

5.1 To study scientific attitude possessed by the Secondary school students.

Table-3: Level of Scientific Attitude possessed by the Whole Sample.

<table>
<thead>
<tr>
<th>Sample size</th>
<th>Mean</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>110</td>
<td>126.85</td>
<td>15.402</td>
</tr>
</tbody>
</table>

It is clear from the table-3, that the students studying in secondary schools hold average level of scientific attitude. In the sample, as per the standard deviation, there is a little bit of higher dispersion of scores in the units of the sample.

Hypothesis-1: There is no significant difference in scientific attitude of boys and girls of secondary schools.

Table-4: Comparison of Scientific Attitude in Boys and Girls

<table>
<thead>
<tr>
<th>S.No</th>
<th>Category</th>
<th>N</th>
<th>Mean</th>
<th>S.D</th>
<th>‘t’Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Boys</td>
<td>57</td>
<td>124.65</td>
<td>16.07</td>
<td>1.56</td>
</tr>
<tr>
<td>2.</td>
<td>Girls</td>
<td>53</td>
<td>129.21</td>
<td>14.43</td>
<td>1.56</td>
</tr>
</tbody>
</table>

Dr. Y. Chakradhara Singh, C. Arundhati Bai: A Study of Scientific Attitude of Secondary School Students in West Tripura District
**P at 0.01 level is 2.58**

**Not significant at 0.01 level**

As per the critical ratio value of the above table, it is clear that there is no significant difference between the levels of scientific attitude possessed by boys and girls. The difference is not significant as the obtained ‘t’ value (1.56) is less than ‘t’ table value (2.58) at 0.01 level of significance. Both the boys and girls are with average scientific attitude.

**Hypothesis-2: There is no significant difference in scientific attitude of private and government secondary school students.**

Table- 5: Comparison of Scientific Attitude in the Students of Private and Government Schools

<table>
<thead>
<tr>
<th>S.No</th>
<th>Category</th>
<th>N</th>
<th>Mean</th>
<th>S.D</th>
<th>‘t’Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Private</td>
<td>50</td>
<td>133.74</td>
<td>15.82</td>
<td>4.58$</td>
</tr>
<tr>
<td>2.</td>
<td>Govt</td>
<td>60</td>
<td>121.1</td>
<td>12.52</td>
<td></td>
</tr>
</tbody>
</table>

$ Significant at 0.01 level

According to the above table-5, there is a significant difference in the level of scientific attitude possessed by the students studying in private and government schools. The difference is significant as the obtained ‘t’ value (4.58) is more than ‘t’ table value (2.58) at 0.01 level of significance. The students studying in private schools are relatively better in holding scientific attitude than those of government schools.

**Hypothesis- 3: There is no significant difference in scientific attitude of urban and rural secondary school students.**

A comparison is made to identify the difference in the possession of scientific attitude by the students residing in urban and rural areas. The results are as follows.

Table – 6: Comparison of Scientific Attitude in the Students of Urban and Rural Schools

<table>
<thead>
<tr>
<th>S.No</th>
<th>Category</th>
<th>N</th>
<th>Mean</th>
<th>S.D</th>
<th>‘t’Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Rural</td>
<td>43</td>
<td>122</td>
<td>12.23</td>
<td>2.91$</td>
</tr>
<tr>
<td>2.</td>
<td>Urban</td>
<td>67</td>
<td>129.96</td>
<td>16.47</td>
<td></td>
</tr>
</tbody>
</table>

$ Significant at 0.01 level

As per the critical ratio value, from the given table-6, there is significant difference in the level of scientific attitude possessed by the students of rural and urban secondary schools. It can be seen that the students of urban secondary schools hold slightly high scientific attitude than rural secondary schools.

**Hypothesis- 4: There is no significant difference in scientific attitude of Bengali medium and English medium secondary school students.**
Table -7: Comparison of Scientific Attitude in the Students of Bengali Medium and English Medium Schools

<table>
<thead>
<tr>
<th>S.No</th>
<th>Category</th>
<th>N</th>
<th>Mean</th>
<th>S.D</th>
<th>‘t’Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Bengali</td>
<td>60</td>
<td>121.1</td>
<td>12.52</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>English</td>
<td>50</td>
<td>133.74</td>
<td>15.82</td>
<td></td>
</tr>
</tbody>
</table>

$ Significant at 0.01 level

From the above table-5, it is clear that there is significant difference between the level of scientific attitude possessed by the students studying in Bengali medium and English medium schools. The students studying in English medium schools are relatively better in holding scientific attitude than those of Bengali medium schools.

VI. FINDINGS

From the present study it is observed that the students studying in secondary schools hold an average level of scientific attitude. No significant difference is found between the levels of scientific attitude possessed by boys and girls. But the variables-Residence, Medium of Instruction and Type of school had significant difference in the level of scientific Attitude, and thus hypothesis is rejected. It can be seen that the students of urban secondary schools and English medium schools hold slightly high scientific attitude than those of rural secondary schools and Bengali medium schools.

VII. SUGGESTIONS

Based on the findings of the study some suggestions are worth mentioning. One of the major aims of teaching science is invariably the development of scientific attitude in the student. Some of the factors like: providing proper atmosphere in the class, proper use of practical class, well-equipped science labs with proper facilities, engaging in wide reading in general science, utilizing science library properly, reading paper cuttings from news papers, good textbooks, co-curricular activities in science such as making scientific models, organizing science clubs, discarding superstitious beliefs from students by teaching science lessons practically and stressing the need to collect evidences before arriving at some conclusion, etc. influence in development of scientific attitude among students. All these are helpful and can be implemented practically to promote the scientific attitude among the students. Science teachers must try to promote scientific attitude in the students through some procedures like taking students to science exhibitions, fairs, excursions, fieldtrips, industries, etc. Due steps must be taken by the government especially in rural areas for the development of students. It is also seen that the changes in science and technology are accessible to everybody at any time everywhere. So, special focus must be given by the teachers to promote scientific attitude in students. There is a need to develop the facilities to
promote quality in science instruction to develop scientific attitude along with the medium of instruction.

VIII. SUGGESTIONS FOR FURTHER RESEARCH

Based on the present study, a good number of new areas can be studied by the future researchers. The areas and variables which are not covered by this study may be put to test to enlighten the factors associated with inculcation and development of scientific attitude and other factors associated with achievement in science. Critical observations can also be taken up at different levels, to identify the factors that influence scientific attitude, students studying in state and central schools, to identify the influence of educated and uneducated parents on the scientific attitude etc.

IX. REFERENCES


TO CITE THIS PAPER