Relationship Between Scientific Aptitude and Achievement in Science Subject of Class IX Students in Ri Bhoi District of Meghalaya

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Received: May 27, 2018 Accepted: July 08, 2018

ABSTRACT *Scientific aptitude plays a major role in understanding the contents of science subject. It is a special intellectual ability to comprehend scientific facts and knowledge. It is a specific ability which enables the individual to acquire scientific knowledge and understanding through teaching and learning process. While teaching any lesson of science subject in the class, a teacher introduces meaningful and interesting science related activities which arouse the understanding of the students. The students are able to grasp in their mind the concept of the lesson because of the role of scientific aptitude. Scientific aptitude makes the students to be able to understand, analyse, organise and synthesise the scientific concept in a meaningful and purposeful way. Once the students learns thoroughly the science subject, it makes them easy to perform well in the examination. One of the objectives of the present study is study the relationship between scientific aptitude and achievement in science subject of Class IX students in Ri Bhoi District of Meghalaya. The study was conducted on sample of 800 hundreds students. Scientific Aptitude Test battery developed by Dr. K.K Agarwal and Dr. Saroj Aurora(1986) and Achievement Test in Science Subject were administered to a selected sample. The findings of the study revealed that there is a significant relationship between scientific aptitude and achievement of secondary school students.*

Keywords: *Scientific Aptitude, Achievement in science Subject, Class IX Students,*

Introduction:

Education helps to systematize knowledge and to realize the values of life and works continuously for the advancement of society. It produces individuals who can make a remarkable contribution in the field of science and technology. In the process of development of science and technology education plays a very essential role. It helps the individuals to be explorative and innovative through the process of construction of knowledge by utilizing the natural resources. Education helps to apply knowledge for bringing desirable changes in life and society as well. For the inventions and discovery of natural resources and making scientific plans and programmes for the use of resources without disturbing natural balance, application of knowledge has a special importance. Education provides an individual with courage to face the challenge of life. Without courage and adventurous, the individual will not be able to venture in the field of science and technology. In this context, education is treated as the process of human resource development. It includes all the processes that develop human capacities to make individual fit to face the life courageously and work for the progress of mankind. The learning experiences of the schools develop the tendency of the students to undertake research so as to discover the hidden resources and to invent the new ideas and knowledge. All the school subjects are taught because they provide education to the students. Science as one of the subject of study takes its place side by side with other subjects as essential elements of one's education. The rapid advancement of science and technology and the increasing need for scientists and technologists have made it all the more important to provide for science based education in the schools. Hence, in a country like India, science finds a place in the school curriculum to provide a broad based scientific knowledge among the students. Coming to the meaningful science education for the students, it is also imperative to make the students acquire proper knowledge and understanding on scientific facts. The students are also expected to be able to apply scientific concepts in different fields of life.

Science has now become a compulsory subject in the school curriculum. In school, science subject seeks the possibility to draw out and explain the hidden potentials in the student and in the environment. It develops a spirit of commitment of man to free enquiry and the quest for truth. It deepens the knowledge and understanding of the pupils about the natural phenomena and helps them to understand themselves and their place in the universe. We see that the advancement of science and technology is fast, that it inspires the educational thinkers to include science as a subject of studies in the school curriculum. The science curriculum inculcates the mind of the students to see the utility of science in their daily lives. The

Kothari Commission(1964-66) also laid great emphasis on making science an important element in the school curriculum. Teaching science at school level provides the students the opportunity to develop their mental faculties of reasoning, imagination, memory, observation, concentration, analysis, originality and systematic thinking. The teaching and learning of science helps the students to acquire the skills of inquiry, analytical thinking, problem solving and decision making skills. It makes the students to understand that science has entered in our life and daily activities so much so that that our existence would become impossible without it. The teaching learning process of science at school is aimed at the utility of science in the daily life, that whatever the students learns has immediate application in all aspects of human life. Keeping in mind the importance of learning science, science subject find a place as a compulsory subject in the school curriculum

It is an observable fact that in school we come across students who excel over others, under similar conditions, in acquiring scientific knowledge and skills. Such students are said to possess a certain specific ability or aptitude in addition to intellectual abilities or intelligence which helps them in the achievement of this subject. The teachers too come across students whose scientific aptitudes enable them to perform scientific activities in a creative and innovative way

Scientific aptitude plays a major role in understanding the contents of science subject. It is a special intellectual ability to comprehend scientific facts and knowledge. It is a specific ability which enables the individual to acquire scientific knowledge and understanding through teaching and learning process. While teaching any lesson of science subject in the class, a teacher introduces meaningful and interesting science related activities which arouse the understanding of the students. The students are able to grasp in their mind the concept of the lesson because of the role of scientific aptitude. Scientific aptitude makes the students to be able to understand, analyse, organise and synthesise the scientific concept in a meaningful and purposeful way. Once the students learn thoroughly the science subject, it makes them easy to perform well in the examination.

Need and Justification of the Study

Achievement in Science Subject is of key importance at the secondary level since it provides a base for higher studies. Students' achievement in the field of science depends on many contextual and psychological factors of teaching and learning science. These factors exert some influences on the level and quality of students' achievement in the field of science. Many students lack psychological understanding making them to be unaware of the possibility to utilize science in different fields. In teaching-learning process, the achievement of the students in science subject is also associated with some psychological factors. Scientific aptitude as one of the psychological variables is also to be considered from the point of view of the achievement in science subject. The scientific aptitude may be considered as a special ability which helps the students to acquire the expected level of achievement in science subject. The nature of the effect of scientific aptitude on achievement in science subject among the students can be understood after the research was conducted in a specified parameters. Knowing about scientific aptitude, it is felt to investigate how this variable influences the teaching and learning process in the field of science subject. It is also imperative that scientific aptitude is required to be nurtured in a right direction for enhancing science education among the students. While considering that scientific aptitude as one of the factors which helps the students to be able to learn the subject of science, there is also a need as to how this factor can be enhanced among the secondary school students for better achievement in science subject.

Objective of the Study: To study the relationship between scientific aptitude and achievement in science subject of class IX students in Ri Bhoi District of Meghalaya.

Hypotheses of the study: There is no significant relationship between scientific aptitude and achievement in science subject of class IX students

Sample of the study

Great care has been taken by the investigator in selecting an appropriate sampling technique so as to overcome any kind of bias or inadequacy and undue weightage for a particular group or sub group. After defining the population of the present study, the next step was to select a representative sample from the same population by adopting suitable methods. For increasing the accuracy of the sample, Stratified Random Sampling Technique was thought to be the best suited for selecting the sample of the present study. The sample comprised of 800 class IX students selected from different schools in Ri Bhoi District of Meghalaya. The selected sample included 400 male and 400 female students. Out of 800 students, 484

students were selected from the schools of rural areas and 316 students from the schools of urban areas. Again, the selected sample included 92 students selected from Government schools,354 students from Government Aided Schools and the remaining 354 from private schools.

Tools used

The tools used in the study were

a) Scientific Aptitude Test battery developed by Dr. K.K. Agarwal and Dr. Saroj Aurora (1986)

b) Achievement Test in Science Subject

Statistical Techniques Used

The obtained data were analysed by employing appropriate statistical technique. 'r'- technique was employed to determine the relationship between scientific aptitude and achievement in science subject

Results and Discussion

In the present study, analysis of the collected data gathered through Scientific Aptitude Test battery and achievement test was carried out by applying suitable statistical technique. The results were carefully and meaningfully interpreted.

The following Table shows the coefficient of correlation between scientific aptitude and achievement in science subject

Table: Coefficient of Correlation between Scientific Aptitude and Achievement in Science Subject

Variables	Mean	SD	Df	Computed 'r value	Table 'r Value	Significant Level
Reasoning	28.08	5.45	797	0.580	0.088	.05
Achievement	34.71	10.90				
Numerical Ability	22.51	4.00	797	0.340	0.088	.05
Achievement	34.71	10.90				
Scientific Information	21.72	4.10	797	0.579	0.088	.05
Achievement	34.71	10.90				
Scientific Vocabulary	24.67	5.00	797	0.590	0.088	.05
Achievement	34.71	10.90				
Scientific Aptitude(Over-All)	99.93	15.20	797	0.520	0.088	.05
Achievement	34.71	10.90				

From the above Table, it is evident that

a) For the relationship between scientific aptitude and achievement with regards to reasoning, the tabulated value of 'r' for df=797 is 0.088 at 0.05 level. The obtained value of 'r' (0 .580) being greater than 0.088 indicates that there is a significant relationship between reasoning and achievement at 0.05 level.

b) For the relationship between scientific aptitude and achievement with regards to numerical ability , the tabulated value of 'r' for df=797 is 0.088 at 0.05 level. So the

c) obtained value of 'r' (0 .340) being greater than 0.088 indicates that there is a significant relationship between numerical ability and achievement at 0.05 level.

d) For the relationship between scientific aptitude and achievement with regards to scientific information , the tabulated value of 'r' for df=797 is 0.088 at 0.05 level. So the obtained value of 'r' (0 .579) being greater than 0.088 indicates that there is a significant relationship between scientific information and achievement at 0.05 level

e) For the relationship between scientific aptitude and achievement with regards to scientific vocabulary, the tabulated value of 'r' for df=797 is 0.088 at 0.05 level. So the obtained value of 'r'

(0 .590) being greater than 0.088 indicates that there is a significant relationship between scientific vocabulary and achievement at 0.05 level.

f) For the relationship between the total score of all the dimensions of scientific aptitude and achievement , the tabulated value of 'r' for df=797 is 0.088 at 0.05 level. The obtained value of 'r' (0 .520) being greater than 0.088 indicates that there is a significant relationship between scientific aptitude and achievement at 0.05 level. In this case, the hypothesis that there is no relationship between scientific aptitude and achievement is not accepted.

Pertaining to the scientific aptitude and achievement in science subject among the secondary school student in Ri Bhoi District , it was found that there is a positive (r=0 .520) significant relationship between scientific aptitude and achievement of secondary school students. The studies conducted by Ghosh(1989),Rao(1990),Knungnit Punturat(2001), Chang and Cheng(2002), Esther Sui Chu Ho (2006), Hilal Aklamis and Omer Ergin, (2008) and Stanley(2016) indicate the positive relationship between scientific aptitude and achievement in science subject. This shows that higher the scientific aptitude, the better will be the achievement in science subjects.

Implications

The present study has elicited some important results that have implications upon the achievement in science subject among the secondary school students in Ri Bhoi District. The study has pointed out the relationship between scientific aptitude and achievement in science subjects. It means that the students who have more scientific aptitude are likely to achieve more than those who have less scientific aptitude. As the finding of the study revealed that Scientific aptitude and achievement in science subject are significantly correlated to each other, hence, it implies that putting the students together in such an environment which can help them increasing scientific aptitude by making them expose to scientific programmes and activities can further develop tendencies in them to learn science subject. The present study will also be useful to teacher to identify and improve the achievement of the student in science subject with low scientific by providing them good teaching in enhancing their achievement in science subject.

Recommendations

Some recommendations can be made on the basis of the implications to improve the teaching learning conditions so as to enhance the achievement in science subject among the secondary school students. These are:

a) Innovative methods of teaching science which can stimulate the aptitude of the students should be introduced by the science teachers. Concept mapping, mind mapping, problem solving method, analytical methods of teachings, constructivist approach are some of the methods which can enhance the scientific aptitude of the students
b) Creative abilities of the students are the potentials which contribute to the scientific aptitude of the students. The teachers can develop those skills which enable the students to make use of their creative abilities.
c) Inclusion of scientific activities which demand the reasoning ability of the students can help them to sharpen their analytical power. This will help them to exercise their scientific aptitude in a reasonable and logical way.

Conclusion

Thus, it is hoped that the findings of the present study are educative, meaningful and interesting. The investigator will feel happy if the present study is considered useful in any way, by the students, teachers, researchers and other persons who are interested in the field of science education and learning achievement and for carrying further research in the same field.

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