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Achievement in Science of Secondary School Students in Relation to Scientific Attitude

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Abstract: One of the chief objectives of education is the development of desirable attitudes in the students. It is, therefore, obvious that the teachers must understand the various dimensions of an attitude. It is also to be kept in view that we are required to develop several attitudes in the students like attitude towards studies, attitude towards self, attitude towards colleagues, attitude towards certain ideals, etc. Attitude is purely a psychological concept. From psychological point of view it is difficult to discriminate attitude from other psychological concepts like interest, aptitude or appreciation. Still, it is defined as the readiness of mind to respond to an object, person or a situation. It is something that is learned by an individual as he learns many other things in life. Attitude is an orientation or disposition or a sort of readiness to react in a certain way. Which an individual carries with him in a sort of latent form and it may become manifest in an individuals behavior only when an occasion arises. When an individual has to express his attitude he may react to them in a predetermined manner either favorably or unfavorably or in different manner. Hence this study attempts to know the relationship of achievement in science and scientific attitude among students and the found result from this study was that there is no significant relationship in achievement in science and scientific attitude.

I. Introduction

Scientific Attitude is the most important outcome of science teaching, through some educationalist view that scientific attitude as a by product of teaching science, yet a majority of educationalists consider it to be major product or the 'aim' of science teaching.

Thurston has used the concept of attitude as the sum total of man's inclinations and feelings, prejudice or bias, pre-conceived notions, ideas threats and convictions about any specific topic.

Attitudes are developed, they are not inborn. They can be changed or modified over the time. These modifications of attitudes are based on some of the determinants like culture, tensions, needs, emotions, experiences, provisions etc.

Such an attitude is also noticed in the field of science, which we consider as 'Scientific attitude'. Here, the scientific attitude means ones inclination or readiness of mind towards the pursuit of scientific knowledge. This scientific attitude sometimes interchanged with scientific temper. This temperament is a tendency of an individual who is very much inclined to learn scientific concepts.

Scientific attitude is the part of the attitude. And this is the second value monopolized by science, which is transferable. These attitudes of a scientist involve critical observation, open-mindedness, suspended judgments, free from superstition and false belief etc., which will be discussed in detail later on. The attitude once developed in the students proves useful in later life of the child.

Apart from this the teaching of science is based on sound psychological footing. The principle of activity is the main basis of the teaching of science and satisfies the instincts of curiosity, creativeness, self-assertion, and self-expression etc. of the pupils.

Scientific attitude refers to an individual's outlook towards life. It means a willingness to adopt scientific approaches and procedures for resolving issues, condition, and a stabilized mental set, which expresses itself in a tendency to react to any member of a class of stimuli in the same general way.

Scientific attitude predisposes a person to engage in responsible action after weighing the possible consequences of alternative options, using rational arguments based on evidence.

II. Objectives of the Study:

The study was conducted with following objectives:

- ⇨ To Study the differences in achievement in science of boys and girls of IX Standard.
- ⇨ To Study the differences in achievement in science of boys and girls of IX Standard students studying in different types of schools.
- ⇨ To study the achievement in Science of IX standard students in relation to their different levels of Scientific Attitude.

III. Hypotheses:

- ⇨ There is no significant relationship between achievement in science and Scientific attitude among the students of IX standard studying in Bangalore city.
- ⇨ There is no significant difference in Achievement in science between IX Standard students belonging to low and moderate levels of scientific attitude.
- ⇨ There is no significant difference in Achievement in science between IX Standard students belonging to low and high levels of scientific attitude.
- ⇨ There is no significant difference in Achievement in science between IX Standard students belonging to moderate and high levels of scientific attitude.
- ⇨ There is no significant main and interaction effect of scientific attitude and Achievement motivation on Achievement in science of IX standard students of Bangalore city.
- ⇨ There is no significant main and interaction effect of scientific attitude and Gender on Achievement in science of IX standard students of Bangalore city.
- ⇨ There is no significant main and interaction effect of scientific attitude and Type of schools on Achievement in science of IX standard students of Bangalore city.

IV. Operational definitions:

Achievement in science: In the present study Achievement refers to the extent to which the students of IX standard grasping the subject matter of science.

Scientific attitude: In the present study, scientific attitude refer to the scientific attitude and scientific temper how help them and how the practices used by the students of IX standard in solving the scientific inquiries in science.

Variables:

Dependent Variable as Achievement in Science.
Independent variable as Scientific attitude

Sample:

The Sample for the present study consists of 600 IXth standard secondary school students of Bangalore city. The sample was drawn using stratified random sampling technique from government, private secondary schools in Bangalore city.

Tools used for the Study:

The following are the tools developed based on the Standardization procedures and used by the researcher.
Achievement in Science test by- Researcher

Scientific attitude Scale by – Avinash Grewal..

Statistical Technique Used:

The data analyzed by using the statistical techniques like t-test, co-efficient correlation and two way ANOVA.

Scoring Procedure:

The Scientific attitude scale contains 20 items and each item has 5 statements, among 20 items 10 are positive and 10 are negative. Positive items (Sl.no.2,4,6,8,10,12,14, 16,18,20) of the scale are assigned a weight ranging from 4 (Strongly Agree) to Zero (Strongly Disagree) in case of ten negative items (Sl.no.1,3,5,7,9,11,13, 15,17,19) the scale scoring is reversed ranging from Zero (Strongly Agree) to age group.

V. Analysis and Interpretation:

There is no significant relationship between achievement in science and scientific attitude among the students of IX standard studying in Bangalore city.

Table-01: Variables, Number, df, Co-efficient of Correlation values and level of significance between achievement in science and scientific attitude.

Variables	N	df	r-value	Level of significance
Achievement in science	**600**	**598**	**0.298****	**0.01**
Scientific attitude				

It is observed from the above table that a positive relationship is found between scientific attitude and achievement in science among secondary school students. The value is tested for its significance using 'r'. The 'r' value 0.298 is found to be significant at 0.01 level of significance. It is positively low correlation. Therefore the null hypothesis rejected. Hence, it is inferred that there is a significant relationship between scientific attitude and achievement in science of IX standard students.

Thus it is concluded that scientific attitude and achievement in science are positively related.

Table-02: Number, Mean, SD, and t-value of achievement in science scores between gender, type of schools and different levels of scientific attitude among IX standard students.

Variables	N	Mean	SD	t-value	Levels of Significance.
Boys	346	30.13	10.144	5.269**	0.01
Girls	254	34.54	10.104		
Govt.	200	27.59	8.130	7.736**	0.01
Private	400	34.20	10.642		
Low	159	27.67	9.071	4.390**	0.01
Moderate	263	31.96	10.100		
Moderate	263	31.96	10.100	3.997**	0.01
High	178	35.91	10.293		
Low	159	27.67	9.071	7.753**	0.01
High	178	35.91	10.293		

VI. Major important findings of the Study:

1. There is a significant difference in Achievement in Science between IX standard boys and girls (t = 5.269) of Bangalore city.
2. There is a significant difference in Achievement in Science between IX standard students studying (t = 7.736) in govt. and private schools of Bangalore city.
3. There is a significant difference in Achievement in Science between IX standard students belonging to low and high (t = 7.753) levels of scientific attitude.
4. There is a significant difference in Achievement in Science between IX standard students belonging to moderate and high (t = 3.997) levels of scientific attitude.
5. There is a significant difference in Achievement in Science between IX standard students belonging to low and moderate (t = 7.383) levels of Scientific attitude.
6. There is a significant relationship between achievement in science and scientific attitude (r = 0.298) among the students of IX standard studying in Bangalore city.
7. There is a significant main effect of scientific attitude (F =3.895) on Achievement in science of IX standards students of Bangalore city and there is significant main effect of achievement motivation (F =61.980) and there is no significant interaction effect of scientific attitude and achievement motivation (F =1.926) on Achievement in science of IX standards students of Bangalore city.
8. There is a significant main effect of scientific attitude (F =22.353) on Achievement in science of IX standards students of Bangalore city and there is significant main effect of gender (F =19.973) and there is no significant interaction effect of scientific attitude and gender (F =0.284) on Achievement in science of IX standards students of Bangalore city.
9. There is a significant main effect of scientific attitude (F =15.196) on Achievement in science of IX standards students of Bangalore city and there is significant main effect of type of schools (F =41.239) and there is no significant interaction effect of scientific attitude and type of schools (F =0.428) on Achievement in science of IX standards students of Bangalore city.

VII. Conclusions of the Study:

The interpretation of the results prompted the researcher to draw the following important Conclusions.

1. The girls of IX standards have better Achievement in science than boys of IX Standard.
2. The students of IX standard studying in private schools have better achievement in Science than the students studying in Govt. Schools.
3. Scientific attitude has main effect on Achievement in science among students of IX Standard. The student belonging to high group of scientific attitude performed better in science than the students belonging to moderate and low group of scientific attitude.

Hence, It is concluded that Scientific attitude is one of the factors that affect much towards the achievement in science. The students possessing high scientific attitude achieve better in science than the students possessing low scientific attitude. There is a positive relationship between scientific attitude and achievement in science .Therefore, it is necessary for teachers to enhance the good scientific attitude among the secondary school students.

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