

Vol. 7, Issue 4, January 2018

ISSN 2249-894X

REVIEW OF RESEARCH

An International Multidisciplinary Peer Reviewed & Refereed Journal

Impact Factor: 5.2331

UGC Approved Journal No. 48514

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A STUDY OF RELATIONSHIP BETWEEN SCIENTIFIC ATTITUDE AND ACADEMIC ACHIEVEMENT IN SCIENCE AMONG SECONDARY SCHOOL STUDENTS

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ABSTRACT: -

Science is one of those human activities that man has created to fulfil certain his needs and desires. Disinterested curiosity has been the greatest motive power of scientific research. The 'search of truth' became the dominant motive in the prosecution of science. Science



has now become a part of general education. Science takes its place side by side with other subjects as essential elements of one's education. Scientific attitude is the application of general intellectual capacity to scientific resources and problems. One of the major aims of teaching science is to development of scientific attitude among the

students. The development of scientific attitude makes pupil open minded, helps him to make critical observations, develops in time intellectual honesty, curiosity, unbiased and impartial thinking etc. The academic achievement of secondary school students in science depends upon the role of scientific attitude. Scientific attitude is essential for each individual to live a harmonious life in the nature. Scientific attitude is developed among the student for the beneficial of the individual and to the existence of nature. It will help to study in bringing a typical change in the scientific attitude of students. Achievement in Science may be depends on the scientific attitude and most of other factors. The present research study had taken to find the relationship between scientific attitude and achievement in science among secondary school students.

KEYWORDS: Science, Scientific attitude, Academic achievement.

INTRODUCTION :

The rapid advancement of science and technology and increasing need for scientists and technologists have made it all the more important to provide science based education in the schools. Vigorous methods for the cultivation and promotion of science should be adopted. The secondary Education Commission has recommended that every secondary school pupil should study general science as a compulsory subject, so that pupils gain a basic quantum of scientific knowledge as a part of his general education. In addition, provision should be made for providing elective subjects in science for those students who pursue higher study. Science has now become a compulsory subject in the school curriculum because of its multifarious value to the individual as well as the society.

Science is a body of systematic knowledge. Science is the investigation and interpretation of the natural phenomena, which occurs, in daily life. It is the inner desire of man, which encourages him to find out the reasons for such happenings. The dynamic nature of science has resulted in giving rise to new branches of science like

natural science, physical science and biological science. Through physical science, it is possible to understand the laws and principals of natural phenomenon. In the area of physical science scientist have followed the process approach in understanding the natural phenomenon and to arrive at the new knowledge. The findings of the experiments are based on empirical data, which lay emphasis on the objectivity of its approach, analysis and the generalization. All discoveries and inventions are due to the well-followed scientific steps and analysis. The discoveries and investigations done by the scientists involve various processes such as observation, classification, communication, formulation of hypotheses and experimentation. All this process involves various components of thinking skills.

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. 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 can be defined as desire for accurate knowledge, confidence, critical observation, open-mindedness, suspended judgment, absence of superstitions, false belief and the expectations that the solution of the problem will come through use of knowledge.

NEED AND IMPORTANCE

The process form of the science is more important than its product form as the way of exposing the truth and capturing knowledge is always given more preference in science than mere memorization or gaining knowledge of the accumulated facts. Scientific attitude is essential for everyone to live a harmonious life in the nature. Scientific attitude is developed among the student for the beneficial of the individual and to the existence of nature. Science through it study helps in bringing a typical change in the scientific attitude of its readers and followers. Science is a process as well as a product. The understanding of this process is possibly only when the individual will get depth knowledge about the skills involved in each process.

There is a need for the teacher to be aware of other process skills mentioned in the science literature. The person having such scientific attitude is found to have love for the explanation of truth by adopting true means for such exploration and 'believing in the results of such true findings'. Achievement in science is the measure of what and how much the students have learnt as a result of formal or informal instruction in science subject. Achievement in Science may be depends on the scientific attitude and most of other factors. Now question will arise in mind that is there any relationship between scientific attitude and academic achievement in science subject ? The present research study had taken to find the relationship between scientific attitude and achievement in science among secondary school students.

RELATED STUDIES

The following relevant studies were considered for review of the literature. Clarke (1972) conducted a study on the commonalities of science interests held by intermediate children. The investigation revealed that the intelligence quotient difference did not produce any significant shifts in interest. Interest in particular area of science was significantly related to sex differences. Boys have more interest in science than girls. Bandopadhyay (1984) conducted a study of the Environmental Influence, Academic Achievement and Scientific Attitude as Determinants of Adolescents Attitude towards Science Stream. The investigation revealed that pupils having high positive attitude towards science were difference with respect to the independent variables either in isolation or in integration. Golwalkar (1986) undertook a study on Scientific Attitude, Creativity and Achievement of Tribal Students of Rajasthan. The investigation revealed that when comparison of tribal and non-tribal on ten components of scientific attitude was made, non-tribal were found to be superior to tribal on three components of scientific attitude. Pillai (1987) undertook a study on Interaction Effect of Science Attitude and Science Attitude towards Science on Biology Achievement. The investigation revealed that attitude towards science is also significant beyond 0.01 level. This showed that the subject at the three levels of attitude towards science differ significantly in their Biology achievement. John (1995) conducted a study on the science interest as

a correlate of science achievement and found that the correlation between science interest and science achievement was significant, high and positive. Aruna, P. K and Sumi, V. S. (2010), studied on Process Approach : Effect on Attitude towards science and process skills in science and found that there is significant difference in the mean scores of experimental and control group for the two variables, attitude towards science and process skills in science.

STATEMENT

The statement of the problem stated as “A study on scientific attitude of IX standard secondary school students in relation to their academic achievement in science of Koppal district”

VARIABLES

In the present research study, Scientific Attitude as an Independent Variable, Academic Achievement as a Dependent Variable and Gender (Boys and Girls) & Location (Rural and Urban) as Demographic Variables were considered to find the relationship.

OBJECTIVES

The following objectives were considered for the present study

1. To study the relationship between scientific attitude and academic achievement of IX standard students as a whole.
2. To study the relationship between scientific attitude and academic achievement of IX standard boys students.
3. To study the relationship between scientific attitude and academic achievement of IX standard girls students.
4. To study the relationship between scientific attitude and academic achievement of IX standard rural students.
5. To study the relationship between scientific attitude and academic achievement of IX standard urban students.

HYPOTHESES

The following hypotheses were framed for the present study

1. There is no significant relationship between Scientific Attitude and Academic Achievement in science of IX Standard students as a whole.
2. There is no significant relationship between Scientific Attitude and Academic Achievement in science of IX standard Boys students.
3. There is no significant relationship between Scientific Attitude and Academic Achievement in Science of IX standard Girls students.
4. There is no significant relationship between Scientific Attitude and academic Achievement in Science of IX Standard Rural Students.
5. There is no significant relationship between scientific Attitude and Academic Achievement in science of IX standard Urban students.

SCOPE

The present study was confined to :two variables namely scientific attitude and academic achievement, IXth standard secondary school students, Koppal district government and private four hundred secondary school students (two hundred boys (100 Rural + 100 Urban) and two hundred girls (100 Rural + 100 Urban))

DEFINITIONS OF TECHNICAL TERMS

The following were the operational definitions of the some of the keywords which were commonly used in present research study.

- **Science** : A science is systematic study of knowledge. The term ‘Science’ originated from the Latin word ‘Scientia’, it means ‘Knowledge’, all that, there is that, anybody can know.
- **Scientific Attitude** :NSSE (National Society of the Study of Education) has defined scientific attitudes “ Open

mindedness, a desire for accurate knowledge, confidence in procedures for seeking knowledge and the expectation that the solution of the problem will come through the use of verified knowledge”.

• **Academic Achievement** :Academic achievement is a term used in school when a student does well in academics. They achieve or do well in an area of school and do well in their studies. Academic achievement or (academic) performance is the outcome of education — the extent to which a student, teacher or institution has achieved their educational goals. Academic refers to formal education and school in particular higher learning. If you are a member of institution of higher learning or a scholarly organization, then you would be referred to as an academic.

METHOD

The correlation method was used in the present study. This is one type in Descriptive Method used to as to find the relationship between independent, moderator and dependent variables. Correlation study is used to certain the extent to which two or more variables are related, that is the extent to which variations in one factor correspond with variations in another. The Correlation technique is valuable in cause-effect analysis.

SAMPLE

For the present study, four hundred IXth standard secondary school students of Koppal district were selected as sample and these students were selected using random sampling technique. Totally 10 schools were selected at randomly for the study. Out of which 400 students were taken as sample. In the 400 students, 200 are boys (100 Rural + 100 Urban) and 200 are girls (100 Rural + 100 Urban).

TOOLS

The following tools were used for collecting information. Science Attitude Scale- developed by Avinash Grewal. The scale measures 4 categories (Positive Intellectual, Negative Intellectual, Positive Emotional and Negative Emotional) from the universe of content science attitude. Academic Achievement scores are obtained on the basis of marks scored by the students in the annual examination of the current academic year.

STATISTICAL TECHNIQUES

Pearson’s Product Moment (Correlation) was used for interpretation of the present research data.

ANALYSIS AND INTERPRETATION

Table – 1 : Correlation Coefficient between Scientific Attitude and Academic Achievement in Science of IX Standard Students (n=400)

Variables	Academic Achievement in Science			
	Correlation Coefficient (r)	t-value	P-value	Sign
Scientific Attitude	0.1206	2.4244	<0.05	Yes

From the above table, it is observed that, a relationship between scientific attitude and academic achievement in Science of IX standard students is found to be significant and positive ($r=0.1206$, $t=2.4244$, <0.05 , S) at 0.05% level of significance. Hence the null hypothesis is rejected and alternative hypothesis is accepted. It means that, the scientific attitude score increases (decreases) with increases (decrease) in the academic achievement in science as a whole.

Table – 2 : Correlation Coefficient between Scientific Attitude and Academic Achievement in Science of IX Standard Boys(n=200)

Variables	Academic Achievement in Science			
	Correlation Coefficient (r)	t-value	P-value	Sign
Scientific Attitude	0.1729	2.4698	<0.05	Yes

From the above table, we observe that, a relationship between scientific attitude and academic achievement in Science of IX standard boys students is found to be significant and positive ($r=0.1729$, $t=<0.05$, S) at 0.05% level of significance. Hence the null hypothesis is rejected and alternative hypothesis is accepted. It means that, the scientific attitude scores increases (decreases) with increase (decrease) in the academic achievement in science of boy's students.

Table – 3 : Correlation Coefficient between Scientific Attitude and Academic Achievement in Science of IX Standard Girls (n=200)

Variables	Academic Achievement in Science			
	Correlation Coefficient (r)	t-value	P-value	Sign
Scientific Attitude	0.0818	1.1549	>0.05	NS

From the above table, we observe that, a relationship between scientific attitude and academic achievement in Science of IX standard girls students is found to be not significant and positive ($r=0.0818$, $t=1.1549$, >0.05 , NS) at 0.05% level of significance. Hence the null hypothesis is accepted and alternative hypothesis is rejected. It means that, the scientific attitude scores increases (decreases) with increase (decrease) in the academic achievement in science of girl's students.

Table – 4 : Correlation Coefficient between Scientific Attitude and Academic Achievement in Science of IX Standard Rural School Students (n=200)

Variables	Academic Achievement in Science of IX standard rural school students			
	Correlation Coefficient (r)	t-value	P-value	Sign
Scientific attitude	1.1403	1.9945	<0.05	Yes

From the above table, we observed that, a relationship between scientific attitude and academic achievement in Science of IX standard rural school student is found to be significant and positive ($r=0.1403$, $t=1.9945$, <0.05 , S) at 0.05% level of significance. Hence the null hypothesis is rejected and alternative hypothesis is accepted. It means that, the scientific attitude scores are increases (decreases) with increases (decreases) in the academic achievement in science of rural school students.

Table – 5 : Correlation Coefficient between Scientific Attitude and Academic Achievement in Science of IX Standard Urban School Students (n=200)

Variables	Academic achievement in Science of IX standard Urban school students			
	Correlation Coefficient (r)	t-value	P-value	Sign
Scientific attitude	0.1255	1.7794	>0.05	NS

From the above table, we observe that, a relationship between scientific attitude and academic achievement in Science of IX standard urban school students is found to be not significant ($r=0.1255$, $t=1.7794$, >0.05 , NS) at 0.05% level of significance. Hence the null hypothesis is accepted and alternative hypothesis is rejected. It means that, the scientific attitude scores increases (decreases) with increase (decrease) in the academic achievement in science of urban school students.

FINDINGS

The following were the findings of the present research study.

1. It was shown that the relationship between scientific Attitude and Academic Achievement is science of IX Standard students as a whole is found to be significant and positive.
2. It was shown that the relationship between Scientific Attitude and Academic Achievement in Science of IX standard Boys students is found to be significant and Positive.
3. It was shown that the relationship between Scientific Attitude and Academic Achievement in science of IX standard Girls students is found to be not significant and Positive.
4. It was shown that, relationship between Scientific Attitude and Academic Achievement in Science of IX standard Rural school students is found to be significant and Positive.
5. It was shown that relationship between Scientific Attitude and Academic Achievement in Science of IX standard Urban school students is found to be not significant and Positive.

EDUCATIONAL IMPLICATIONS

The following are the education implications for the present study.

1. The present study helps to develop and analyze the status of scientific attitude among the secondary school students.
2. The present study helps to develop creativeness and inventiveness among students.
3. The present study helps to inculcate scientific methods among the students.
4. The present study helps to develop competences in students to offer professional course like engineering, medicines etc. as their future career.
5. The present study helps to acquaint the students with different aspects of science used in daily life and enable them to recognize that science plays an important role in the service of man.
6. The present study helps to expose the students to different processes used in industries and their technological applications.
7. The present study to provide relevant content materials useful for vocational courses.
8. The present study helps to develop the power of reasoning, critical thinking and application of scientific knowledge among students.
9. To increase students understanding ability by adopting by adopting the self learning method.
10. The present study helps to develop an interest in students to study science as a discipline.

CONCLUSION

The technological and scientific inventions have been responsible for the development that has come to stay in today's world. There is a great need for inventors, innovators, administrators, scientists, engineers etc., for

this we can and must develop the scientific attitude among the pupils. The present study revealed that there is high correlation between the Scientific Attitude and Academic Achievement of the boys and girls, so we can provide the opportunity to the students for the development of the scientific attitude in which students can be exposed to the society. Teachers should try to arouse the interest in this particular area to make pupil to become a harmonious, well balanced and productive citizen of the nation.

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