



A STUDY ON ACHIEVEMENT IN SCIENCE OF SECONDARY SCHOOL STUDENTS IN RELATION TO THEIR ATTITUDE TOWARDS SCIENCE

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ABSTRACT

The purpose of this investigation is to examine the Science Achievement of Secondary School Students in relation to their attitude towards science. The present research was followed by a descriptive survey method. The sample of 200 secondary school students studying in government schools of Kolar Taluk, Kolar District selected as sample. Science Achievement of students was taken from the office records of their respective schools and Attitude Towards Science Scale (ATSS) developed by Dr. Anuradha Agnihotri (2009) was used to assess the attitude towards science of the secondary school students. The collected data was analyzed by correlation and independent 't' test and in all cases the level of significance was fixed at 0.05 level of confidence. The correlation result shows positive significant relationship between attitude toward science learning and science achievement of secondary school students. The same has proved from 't' test analysis that there was a significant difference in the Science Achievement of secondary school students having varied attitude levels towards science. This is confirmed that students who had favourable attitude towards science had higher science achievement than students who had average and unfavourable attitudes. Hence, a positive attitude towards science need to be developed among students and the initiation should start from the beginning of the school education. Therefore, teachers and teacher educators need to inculcate the science attitude among students as it is very much essential for the present-day scientific and technological world.

Keywords: Achievement, Science, Attitude, Secondary, School, Students.

INTRODUCTION

Science has earned an important status by emerging as a powerful force for socio economic changes and development of the nations. Science deals with identifying problems, searching explanations and seeking solution for the welfare and advancement of the society. The spirit and values of science have helped mankind to achieve development in various fields. Hence, the youth must be attracted towards science education and courses should be designed in such a way that every pupil should be given an opportunity to appropriate the needs and potentials of an individual as well as of the country.

Science is a systematized body of knowledge. This knowledge may pertain to any subject or field of life. According to Columbia Encyclopedia, "Science is an accumulated and systematized learning in general usage restricted to natural phenomenon." Science enables the man to study various phenomena in the space and establish various relationships between them. It explains that science is a byproduct of our empirical knowledge and deals with logical reasoning.

The attitude is a concept of belief. One does or does not favour a particular object. One accepts some path or rejects it. All these beliefs, favorableness and acceptance are the expressions of attitude. Thurstone (1929) has defined attitude as degree of positive or negative effect associated with some psychological object. A psychological object, according to him may be a person, an institution, a religion, a community, an ideal, a subject, a system, a political party or a minority community. To use the concept of attitudes in understanding and predicting action, one needs reliable and valid measurement. The measurement of attitudes, like the measurement of all psychological determinants is necessarily indirect. Attitude can be measured only on the basis of inference drawn from the responses of the individual towards the objects, his overt actions and his verbal statements of beliefs, feelings and dispositions to act with respect to the object.

The term 'attitude' towards science is used to indicate all that an individual feels and thinks about science and scientists. Attitude has been defined as ideas with emotional content, important beliefs, prejudices, biases, predisposition and as state of readiness. Sometimes attitudes are thought to be habitual way of looking at an object. Attitudes are generally regarded as an enduring thought modifiable by experiences and by persuasion as learned rather than innate. They are also seen as predisposition to action. They are formed as a result of same kind of learning experiences.

Vithal (2016) found the relationship of adjustment to scholastic achievement of residential and non-residential school students. The results found that there was significant positive relationship of adjustment to scholastic achievement (0.768) and also found no gender difference in the overall adjustment (0.185) and scholastic achievement (0.728). The study also concludes that there was no difference in the overall adjustment (0.772) and scholastic achievement (1.537) of residential and non-residential school students. **Singh; Singh and Giri (2016)** investigated to find out the relationship between scientific attitude and academic achievement of rural area's intermediate college girls of science stream in Varanasi district of Uttar Pradesh. The study revealed that academic achievement was positively as well as significantly correlated with scientific attitude. The study concludes that with increase in academic achievement, scientific attitude of female students also increases and the finding may lie in the fact that at the higher secondary level overall scientific attitude develops among the students in its optimal level. **Lucas (2016)** examined scientific attitude and academic achievement in science of secondary school students in Thane city. The study concluded that the percentage of boys was more than girls for extremely favorable and just favorable scientific attitude; for fairly favorable and just favorable scientific attitude the percentage of girls was more than the boys; for somewhat favourable and unfavourable scientific attitude the percentage of girls and boys students are same.

NEED AND IMPORTANCE OF THE STUDY

The achievement in science is very much dependent upon scientific background and attitude towards science. According to Lawson (1982), science attitude is absolutely necessary to dispel ignorance and backwardness; it will bring a balanced perspective to bear on social evils and conflicts and could lead to a better world. And the most useful scientific attitudes are open mindedness, critical mindedness, respect for evidence, suspended judgment, intellectual honesty, willingness to change opinion, search for truth, curiosity, rational thinking, etc. Attitudes toward science are shaped by different factors such as ability, motivation, quality of instruction, the content of courses, teachers' personalities, home and school environments, the place students live, race and gender. Students attitude towards learning affect their achievement. When attitudes are positive students tends to have a better learning outcome. A significant relation was discovered between students' interest towards learning and their academic achievement (Prokop, Tuncer and Chuda (2007). It is vital to identify what type of perceptions students have towards science; this will improve their academic performance. Findings of Srivastava (2002), Shinde (1982) revealed that students with high achievement in science exhibit higher scientific attitude than their counterparts with low achievement. Science achievement is found to be the predictor of scientific attitude (Bhattacharya, 1997; Alexander, 1995). Many researches have been conducted related to factors affecting students' academic achievement. Various studies also conducted related to achievement in different school subjects and socio-psychological, biological and demographic variables. But studies of relationship between achievement in science and attitude towards science have been less in number, particularly in India especially for school students in Karnataka. Therefore, present study has been conducted to study the science achievement of students in relation to attitude towards science with few variables

STATEMENT OF THE PROBLEM

The purpose of this investigation is to examine the Science Achievement of Secondary School Students in relation to their attitude towards Science. The topic identified for the current investigation is: "A Study on Achievement in Science of Secondary School Students in relation to their Attitude towards Science"

OBJECTIVES OF THE STUDY

1. To find out the relationship between Science Achievement of secondary school students and their attitude towards science.
2. To find out the significant differences in the Science Achievement of secondary school students having different attitude levels towards science.

RESEARCH HYPOTHESES

The following hypotheses guided the study:

1. There is no significant relationship between Science Achievement of secondary school students and their attitude towards Science.
2. There is no significant difference in the Science Achievement of secondary school students having unfavourable and average attitude levels towards science.
3. There is no significant difference in the Science Achievement of secondary school students having average and favourable attitude levels towards science.
4. There is no significant difference in the Science Achievement of secondary school students having unfavourable and favourable attitude levels towards science.

METHODOLOGY

The purpose of this investigation is to examine the Science Achievement of Secondary School Students in relation to their attitude towards Science. The present research was followed by a descriptive survey method. The sample of 200 secondary school students studying in government schools of Kolar Taluk, Kolar District selected as sample. Science Achievement of students was taken from the office records of their respective schools and Attitude Towards Science Scale (ATSS) developed by Dr. Anuradha Agnihotri (2009) was used to assess the attitude towards science of the secondary school students. The collected data was analyzed through correlation and independent 't' test and in all cases the level of significance was fixed at 0.05 level of confidence.

ANALYSIS AND INTERPRETATION OF DATA

Table-1: Table shows 'r' value results related to Science Achievement and Attitude towards Science (N=200; df=198).

Independent and Dependent Variables	Mean	Standard Deviation	'r' value	Sig.
Attitude towards Science	94.895	13.927	0.369	*
Science Achievement	58.745	12.854		

* Significant at 0.05 level.

The table-1 shows correlation results related to Science Achievement and Attitude towards Science of secondary school students. The obtained 'r' value 0.369 which shows a significant positive relationship at 0.05 level ('r' critical value 0.138) between Science Achievement and Attitude towards Science of secondary school students. Hence, the stated null hypothesis is **rejected** and an alternative hypothesis has been formulated that "there is significant positive relationship between Science Achievement and Attitude

towards Science of secondary school students.” It concludes that students with favourable attitude towards science had higher achievement in science and vice versa.

Table 2: Table showing Number, Mean Scores, Standard Deviation, ‘t’ value and level of significance of Science Achievement of secondary school students having varied attitude levels (unfavourable, average and favourable) towards science.

Variable	Groups	No.	Mean Scores	Standard Deviation	‘t’ value and sig. level	Sig. P value
Students’ attitude levels towards Science	Unfavourable	64	56.031	10.606	0.50	NS
	Average	99	55.232	9.078		
	Average	99	55.232	9.078	6.49	*
	Favourable	37	72.837	15.522		
	Unfavourable	64	56.031	10.606	5.84	*
	Favourable	37	72.837	15.522		

*Significant at 0.05 level; ^{NS}Not Significant

The table-2 shows the number, mean scores, standard deviation, ‘t’ value and level of significance of Science Achievement of secondary school students having unfavourable, average and favourable attitude levels towards science.

According to the said table, it was observed that the obtained ‘t’ value 0.50 which is less than the table value of 1.97 (df=161) at 0.05 level and thus it is not significant. Hence, the null hypothesis is accepted that “there is no significant difference in the Science Achievement of secondary school students having unfavourable and average attitude levels towards science.” It concludes that students having unfavourable and average attitude levels towards science had similar type of science achievement.

The said table also seen that the obtained ‘t’ value 6.49 which is greater than the table value of 1.97 (df=134) at 0.05 level and thus it is significant at 0.05 level. Hence, the null hypothesis is **rejected** and an alternative hypothesis has been formulated that “there is a significant difference in the Science Achievement of secondary school students having average and favourable attitude levels towards science.” The students having favourable attitude level towards science (M=72.837) had higher science achievement than students having average attitude level towards science (M=55.232). It concludes that students who had favourable attitude towards science had higher science achievement than students who had average attitudes towards science.

Further, the said table also shows that the obtained ‘t’ value 5.84 which is greater than the table value of 1.97 (df=99) at 0.05 level and thus it is significant at 0.05 level. Hence, the null hypothesis is **rejected** and an alternative hypothesis has been formulated that “there is a significant difference in the Science Achievement of secondary school students having unfavourable and favourable attitude levels towards science.” The students having favourable attitude level towards science (M=72.837) had higher science achievement than students having unfavourable attitude level towards science (M=56.031). It

concludes that students who had favourable attitude towards science had higher science achievement than students who had unfavourable attitudes towards science.

The comparison of Science Achievement of secondary school students having different attitude levels towards science are graphically presented in Fig.1.

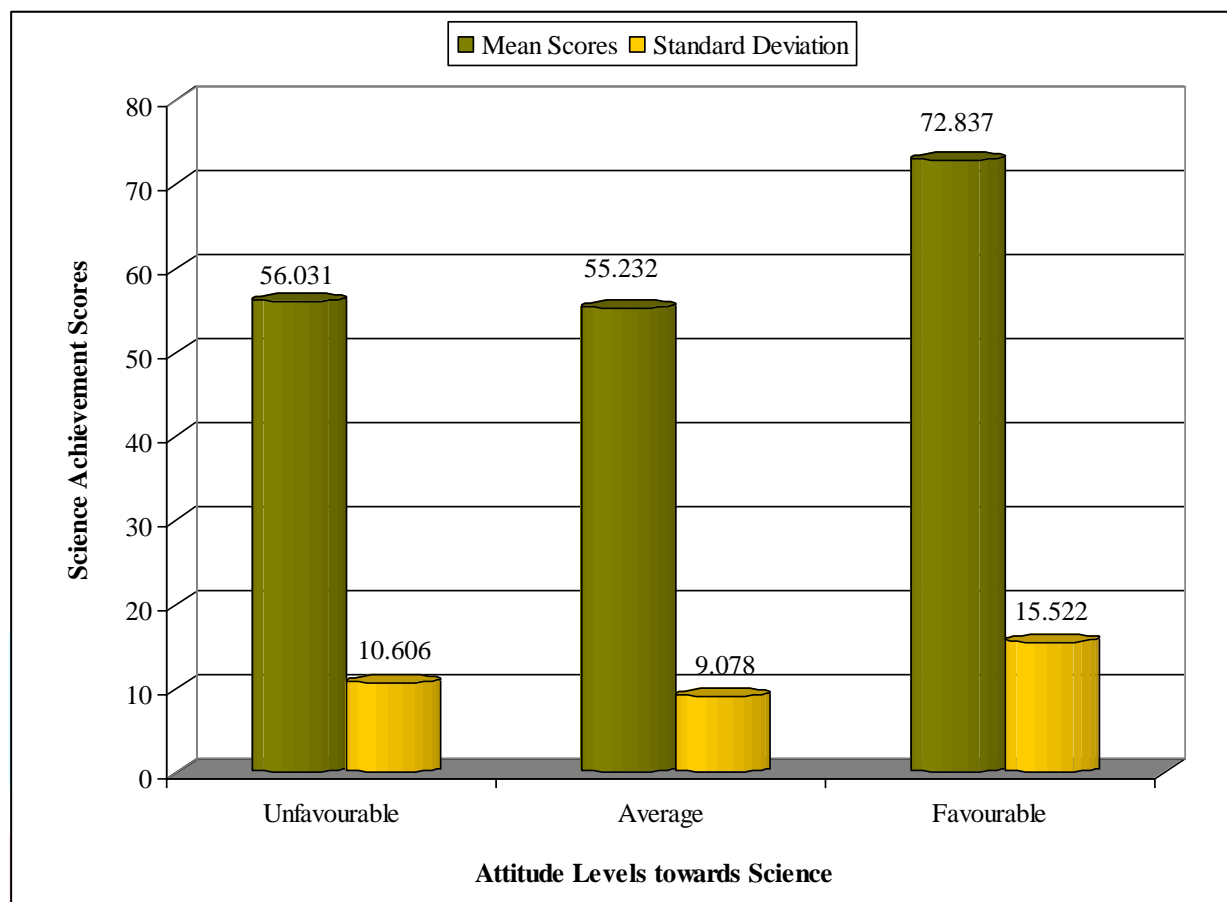


Fig.1

Bar graph showing comparison of Science Achievement of secondary school students having different levels of attitude levels towards science.

RESULTS

1. There was significant positive relationship between Science Achievement and Attitude towards Science of Secondary school students.
2. There was no significant difference in the Science Achievement of secondary school students having unfavourable and average attitude levels towards science.
3. There was a significant difference in the Science Achievement of secondary school students having average and favourable attitude levels towards science.
4. There was a significant difference in the Science Achievement of secondary school students having unfavourable and favourable attitude levels towards science.

CONCLUSION

The correlation result shows positive significant relationship between attitude toward science learning and science achievement of secondary school students. The same has proved from 't' test analysis that there was a significant difference in the Science Achievement of secondary school students having varied attitude levels towards science. This is confirmed that students who had favourable attitude towards science had higher science achievement than students who had average and unfavourable attitudes. Hence, a positive attitude towards science need to be developed among students and the initiation should start from the beginning of the school education. Therefore, teachers and teacher educators need to inculcate the science attitude among students as it is very much essential for the present-day scientific and technological world.

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