INFLUENCE OF SCIENTIFIC APTITUDE AND ACADEMIC ACHIEVEMENT OF HIGHER SECONDARY STUDENTS ON THEIR INTEREST IN CHEMISTRY

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ABSTRACT

This research paper was an attempt to find out the influence of scientific aptitude and academic achievement of higher secondary students in chemistry. The survey method was adopted for the study. The sample consisted of 500 students from 19 schools in Thoothukudi. Random sampling technique was employed. A standardized tool developed by Chatterjee and Mukherjee was used for measuring scientific aptitude. Self made tools were used to measure academic achievement and interest in chemistry of the higher secondary students. Percentage analysis, correlation analysis and multiple correlation analysis were the statistics used for data analysis. The findings of the study revealed that interest in chemistry, their scientific aptitude and their academic achievement in total and in the dimensions are moderate. The correlation is found positively significant among these variables. Scientific aptitude and academic achievement of higher secondary students are also found to have significant influence on their interest in chemistry.

INTRODUCTION

Education plays the most important role in enhancing status of human-beings. Education is a powerful tool which can bring about a radical transformation in society. Education is a process of individual development. It is both theoretical and practical. It is science as well as art. Science is a body of knowledge and the process of acquiring knowledge. Science has many branches. Chemistry is one among them. Chemistry is the science that attempts to classify all kinds of matters in the universe and to understand the changes that the various forms of matters undergo.

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NEED FOR THE STUDY

Science demands a re-construction of modern culture since progress is always made by each generation. Majority of the experiments and technology depend upon the concept of chemistry. So, it is necessary to pay attention to the fundamental concept of chemistry.

Academic achievement is of paramount importance particularly in the present socio-economic and cultural context obviously in the school. The school has its own systematic hierarchy which is largely based on achievement and performance. So the achievement being dependent on many independent components is the concern of educationalist to fix the dominant among them for facilitating better learning and achievement. The present study attempts to find out the influence of scientific aptitude and academic achievement of higher secondary students on their interest in chemistry.

OBJECTIVES

1. To find out the level of interest of higher secondary students in chemistry and in the dimensions namely psychological, sociological and economical, level of scientific aptitude of higher secondary students, and the level of academic achievement of higher secondary students in chemistry and in the dimensions namely knowledge, understanding and application.
2. To find out the significant correlation, if any, between interest of higher secondary students in chemistry and their scientific aptitude and among the dimensions of these variables.
3. To find out the significant correlation, if any, between interest of higher secondary students in chemistry and their academic achievement and among the dimensions of these variables.
4. To find out the significant correlation, if any, between the academic achievement of higher secondary students in chemistry and their scientific aptitude and among the dimensions of these variables.
5. To find out the influence, if any, of scientific aptitude and academic achievement of higher secondary students on their interest in chemistry.

HYPOTHESES

1. There is no significant correlation between interest of higher secondary students in chemistry and their scientific aptitude and among the dimensions of these variables.

2. There is no significant correlation between interest of higher secondary students in chemistry and their academic achievement and among the dimensions of these variables.
3. There is no significant correlation between the academic achievement of higher secondary students in chemistry and their scientific aptitude and among the dimensions of these variables.
4. There is no influence of scientific aptitude and academic achievement of higher secondary students on their interest in chemistry.

METHOD

Since the present study aimed at what exists at present, survey method of research has been adopted. The population for the present study was identified as higher secondary students. Among the population, 500 students were selected for the present paper. Simple random technique was adopted by the investigator. The investigators have used three tools of which two are self-made tools and one standardized tool to collect the data. The validity of the tool was established through item-total correlation. Test re-test method was followed for establishing the reliability of the tool.

The tool to measure 'Interest in chemistry' of higher secondary students consisted of 70 items in which (i) 53 items were psychological (ii) 12 items were sociological and (iii) 5 items were economical. The maximum score was 280 and minimum score was 0. The tool used to measure academic achievement in chemistry consisted of 40 items of which (i) 20 items were for knowledge (ii) 13 items were for understanding and (iii) 7 items were for applications. The maximum score was 40 and minimum score was 0.

The tool used to measure scientific aptitude was a standardized tool developed by Chatterjee and Mukherjee. It consists of 72 items. Maximum score was 72 and minimum score was 0. The statistical techniques applied were percentage analysis, correlation analysis and multiple correlation.

ANALYSIS OF DATA

1. Level of interest in chemistry of Higher Secondary Students

Table 1
LEVEL OF INTEREST IN CHEMISTRY OF HIGHER SECONDARY STUDENTS IN TOTAL AND IN DIMENSIONS

Sl.	Variables	Dimensions	Number	Low	Medium	High

No.				No.	%	No.	%	No.	%
1	Interest in Chemistry	Psychological	500	83	16.60	337	67.40	80	16.00
		Sociological	500	83	16.60	337	67.40	80	16.00
		Economic	500	72	14.40	338	67.60	90	18.00
		Total	500	84	16.80	337	67.40	79	15.80
2	Scientific Aptitude	Total	500	89	17.80	318	63.60	93	18.60
3	Academic Achievement in Chemistry	Knowledge	500	99	19.80	303	60.60	98	19.60
		Understanding	500	81	16.20	328	65.60	91	18.20
		Application	500	55	11.00	358	71.60	87	17.40
		Total	500	76	15.20	325	65.60	99	19.80

It is inferred from the table 1, that 67.40% of higher secondary students have medium level of interest in chemistry, 16.80% of higher secondary students have low level of interest in chemistry and 15.80% of higher secondary students have high level of interest in chemistry 'in total'.

63.60% of higher secondary chemistry students have medium level of scientific aptitude, 17.80% of higher secondary chemistry students have low level of scientific aptitude and 18.60% of higher secondary chemistry students have high level of scientific aptitude

The table also shows that 65.00% of higher secondary students have medium level of academic achievement in chemistry, 15.20% of higher secondary students have low level of academic achievement in chemistry and 19.80% of higher secondary students have high level of academic achievement in chemistry.

Hypothesis 1

There is no significant correlation between interest of higher secondary students in chemistry and their scientific aptitude and among the dimensions of these variables.

Table 2

CORRELATION BETWEEN INTEREST OF HIGHER SECONDARY STUDENTS IN CHEMISTRY AND THEIR SCIENTIFIC APTITUDE

Sl.No.	Dimensions of Interest	No.	Scientific Aptitude		
			'r' value	Table value	Remarks
1	Psychological	500	0.271	0.088	S
2	Sociological	500	0.249	0.088	S

3	Economical	500	0.149	0.088	S
4	Total	500	0.273	0.088	S

From table 2, it is inferred that there is significant positive correlation between interest in chemistry and their scientific aptitude among higher secondary students. The table also shows that there is significant positive correlation between different dimensions of interest in chemistry of higher secondary students and their scientific aptitude. Hence the null hypothesis is rejected.

Hypothesis 2

There is no significant correlation between interest of higher secondary students in chemistry and their academic achievement and among the dimensions of these variables.

Table 3
CORRELATION BETWEEN THE DIFFERENT DIMENSIONS OF ACADEMIC ACHIEVEMENT AND DIFFERENT DIMENSIONS IN INTEREST OF HIGHER SECONDARY STUDENTS

Sl. No.	Dimensions of interest	No.	Psychological			Sociological			Economical			Total		
			'r' value	Table value	Remarks	'r' value	Table value	Remarks	'r' value	Table value	Remarks	'r' value	Table value	Remarks
1.	Knowledge	500	.282	.088	S	.206	.088	S	.168	.088	S			
2.	Under-standing	500	.233	.088	S	.183	.088	S	.160	.088	S			
3.	Application	500	.273	.088	S	.162	.088	S	.192	.088	S			
4.	Total	500										.293	.088	S

From table 3, it is inferred that there is significant positive correlation between interest in chemistry of higher secondary students and their academic achievement in chemistry. The table also shows that there is significant positive correlation between the different dimensions of academic achievement and different dimensions in interest of higher secondary students in chemistry. Hence the null hypothesis is rejected.

Hypothesis 3

There is no significant correlation between the academic achievement of higher secondary students in chemistry and their scientific aptitude and among the dimensions of these variables.

Table 4

CORRELATION BETWEEN SCIENTIFIC APTITUDE AND DIFFERENT DIMENSIONS OF ACADEMIC ACHIEVEMENT OF HIGHER SECONDARY STUDENTS IN CHEMISTRY

Sl. No.	Dimensions of Academic Achievement in Chemistry	No.	Scientific Aptitude		
			'r' value	Table value	Remarks
1	Knowledge	500	0.271	0.088	S
2	Understanding	500	0.249	0.088	S
3	Application	500	0.149	0.088	S
4	Total	500	0.531	0.088	S

From table 4, it is inferred that there is significant positive correlation between scientific aptitude and their academic achievement in chemistry. The table also shows that there is significant positive correlation between the scientific aptitude and different dimensions of academic achievement of higher secondary students in chemistry. Hence the null hypothesis is rejected.

Hypothesis 4

There is no influence of scientific aptitude and academic achievement of higher secondary students on their interest in chemistry

Table 5

INFLUENCE OF SCIENTIFIC APTITUDE AND ACADEMIC ACHIEVEMENT OF HIGHER SECONDARY STUDENTS ON THEIR INTEREST IN CHEMISTRY

Variable	Interest in chemistry	Scientific aptitude	Academic achievement	Multiple correlation	'f' value	df	Remarks
Interest in chemistry	1.000	0.273	0.293	0.517	90.812	2, 497	S
Scientific aptitude	0.273	1.000	0.531				
Academic achievement	0.293	0.531	1.000				

From table 5, it is inferred that there is significant influence of scientific aptitude and academic achievement of higher secondary students on their interest in chemistry. Hence the null hypothesis is rejected.

RECOMMENDATIONS OF THE STUDY

It is found out from this study that only 15.80% and 18.60% and 19.80% of higher secondary students were found to have high interest in chemistry, scientific aptitude and academic achievement respectively. It is further found that the significant positive correlation is found among scientific aptitude, interest in chemistry and academic achievement of higher secondary students in chemistry. It is also found that scientific aptitude and academic achievement influence the interest of higher secondary students in chemistry. The following recommendations are, therefore, given for the educational implications.

(i) Teachers should create interest in chemistry among higher secondary students.

(ii) The chemistry related entertainment activities could be designed and taught. The students also may be involved in this task.

(iii) The efforts which are taken for improving study habits could be adopted for improving the scientific aptitude of higher secondary students.

(iv) Some counselling programmes could be arranged in the needy institution on the strategies of improving academic achievement.

(v) Quiz programmes and essay competitions with special importance to chemistry should be conducted.

(vi) Chemistry related projects and field trips could be insisted on the part of the school education.

CONCLUSION

Teaching has become more complex and challenging today than yesterday. The teachers' effort and dedication in their service have developed the students' scientific attitude. The students with interest towards chemistry and good study habits perform better. Such a better performance is useful for the student in selecting their career for their upliftment, which in turn, will lift the society.

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