

ACHIEVEMENT IN PHYSICS IN RELATION TO THE ACHIEVEMENT IN LANGUAGE OF STANDARD IX STUDENTS

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Abstract

The study was intended to find out the relationship between Achievement in Science Subjects and Achievement in Language. The three language formula that we follow in schools and the new 2 year B.Ed. curriculum give much importance to language education. Language education mainly aims at cultural and moral development along with communication skill. Science education and research in science and technology play a crucial role in the development of the individual, society and nation. So it is the need of the hour to find out whether there is any relationship between Achievement in Science and Achievement in Language and whether it is directly proportional or indirectly. The study was conducted on a representative sample of 600 pupils of standard IX from 15 schools of Thrissur, Palakkad, Malappuram, Kozhikode and Kannur revenue districts of Kerala using stratified random sampling technique. Achievement tests were used as the tool. The study proved a significant difference in mean scores of Achievement in Physics and Achievement in Language. The correlation between Achievement in Physics and Achievement in Language for total sample and subsamples were also significant. It was also found that higher the Achievement in Language the more the Achievement in Physics and vice versa.

INTRODUCTION

According to Arnold, M(1966), Culture is the sweetness of temper. Value oriented education is indispensable for the widening of mind and for sweetness of our temper. Can science education inculcate personal, educational, social and national values. Lyopard and Crotty the exponents of Post Modernism vehemently criticize and attack the warmongering modern world pointing out that science in the pretext of changing and developing the society and environment by imparting better living conditions actually promotes and creates avenues of oppression, massacre and complete destruction. No part of the world is free from fear of corruption, terrorism and violence. Value oriented education is the only panacea for establishing peace and harmony in our society and it is the need of the hour.

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Values should be inculcated through education. Language education is one of the main means to this end. Here in this context one may naturally doubtful that if we give so much importance to language learning in our curriculum for the sake of value education whether it will be a hindrance to the learning of science and the achievements in science subjects which play a pivotal role in the development and progress of the individual, society and nation. Hence science education is the most powerful determining and attractive factor as far as the material aspects of this mundane world is concerned for it is indispensable in achieving better living conditions, what we all want to have. Hence learning of any language at the expense of achievements in science education cannot be, at any rate, encouraged or recommendable.

The two years B.Ed. curriculum introduced by NCTE not only gives ample opportunities for developing basic and higher order language skills but also provide provision for understanding the colloquial language that prevail in the rural and urban areas of the nearby schools and communities where the teacher educand is undergoing teacher education. The three language formula that now we are following in the curricula for schools, surely will impart new momentum for language education of higher order as these educands enter into teacher's profession since each and every subject teacher and language teacher has acquired and enhanced the professional capacities to promote language learning and value education along with their pedagogical subjects as they have been trained for that purpose with thorough theoretical knowledge and practical experience through the new B.Ed. curriculum.

Nowadays, after school education, it is a long cherished wish or craze for the students to try for medical and engineering entrance examinations that demand thorough knowledge of science subjects. Only a few students select language education and go for general degree course. So in this context it is worthwhile and need of the hour to examine whether the achievement of the pupils in the language subjects will affect their achievement in science subjects and in which direction it will affect.

As the investigator do not have enough instances to prove or substantiate that importance given to language learning as envisaged and followed by NCTE will not become a hindrance in the achievement in science subjects or instead the achievement in languages will enhance pupil's ability in the achievement in science subjects. Hence the investigator being a former Physical science teacher in secondary school, intended to make

a study to find out whether there exists any relationship between Achievement in Science and Achievement in Language and selected IX standard pupils to conduct the study.

OBJECTIVES OF THE STUDY

1. To find out whether there exists any significant difference in the mean scores of the Achievement in Physics and Achievement in Language for the total sample and selected subsamples such as (a) boys and girls (b) urban and rural schools and (c) government and private schools.
2. To test whether there exists any significant difference in the mean scores among the three levels of Achievement in Language (high, average and low) with Achievement in Physics for the total sample.
3. To estimate the extent of relationship between Achievement in Physics and Achievement in Language for total sample and the selected subsamples such as (a) boys and girls (b) urban and rural schools (c) government and private schools.

HYPOTHESES OF THE STUDY

1. There exists significant difference in the mean scores of the Achievement in Physics and Achievement in Language for the total sample and selected subsamples such as (a) boys and girls (b) urban and rural schools (c) government and private schools.
2. There exists significant difference in the mean scores among the three levels of Achievement in Language (high, average and low) with Achievement in Physics for the total sample.
3. There exists significant relationship between Achievement in Physics and Achievement in Language for total sample and the selected subsamples such as (a) boys and girls (b) urban and rural schools (c) government and private schools.

METHODOLOGY

Research Sample:

The study was conducted on a representative sample of 600 pupils of standard IX from 15 schools of Thrissur, Palakkad, Malappuram, Kozhikode and Kannur revenue districts. Stratified random sampling technique was used, giving due representation to

factors like gender, type of school management (Government or Private) and location of the schools (urban and rural)

Tools Used:

The following tool was used for measuring the variable

1. Test of Achievement in Physics for standard IX pupils (Naseema & Gopalakrishnan, 2018).

Average of the marks obtained in the school examinations in languages (Malayalam, English and Hindi) were used for assessing the Achievement in Languages of each student.

Statistical Techniques Employed:

1. Test of significance of difference between means for large independent sample. (Garrett, 1979)
2. Pearson’s Product Moment Coefficient of Correlation ‘r’

PRELIMINARY ANALYSIS

The Mean, Median, Mode, Standard Deviation, Skewness and Kurtosis were calculated for the independent variable Achievement in Language and Dependant variable Achievement in Physics for total sample and subsamples using conventional methods.

Table 1. Statistical Constants of Achievement in Language and Achievement in Physics for the Total Sample

Sl. No.	Variable	Mean	Median	Mode	S.D	Skewness	Kurtosis
1.	Achievement in Languages	46.09	45	41	20	0.26	0.69
2.	Achievement in Physics	50.08	47.05	42	19.61	0.36	0.67

The standard deviation, skewness and kurtosis of the Achievement in Language are 46.09, 45, 41, 20, 0.26 and 0.69. The statistical constants of the Achievement in Physics are 50.08, 47.05, 42, 19.61, 0.36 and 0.67 respectively. All the values have been calculated for the total sample (N=600).

The shape of the distribution of scores of the Achievement in Physics and the Achievement in Language were examined by plotting the distribution. The statistical constants and the graphical representation of the variables revealed that all the distribution approximate to normality.

STUDY OF GROUP DIFFERENCE

The group difference in the two variables was found out from the mean and standard deviation. The difference between the mean scores of the comparable groups was tested using a two-tailed test of significance. For two tailed test critical ratio exceeding 2.58 was considered significant at 0.01 level. Critical ratio exceeding 1.96 was treated as significant at 0.05 level.

For the Total Sample

Critical ratio for difference between mean scores of Achievement in Physics, and Achievement in Language for the total sample was calculated. Data and the result of the test of significance are presented in Table 2.

Table 2. Details of the Test of Significance of Mean Scores of Select Variables for Total Samples

Sl. No.	Variable	N	Mean	S.D	Critical Ratio
1.	Achievement in Physics	600	50.08	20.6	5.24**
	Achievement in Language	600	46.09	21.75	

** significant at 0.01 level

The critical ratio of Achievement in Physics and Achievement in Language was found to be greater than the limit set for 0.01 level of significance. This showed that Achievement in Physics and Achievement in Language differ significantly for the total sample. The high mean of Achievement in Physics when compared with that of Language showed that Achievement in Physics of pupils was higher than their Achievement in Language.

Critical ratio for difference between mean scores Achievement in Physics, and Achievement in Language for the subsamples were calculated. The summarized results of the analysis are given in Table 3.

Table 3. Summary of Test of Significance of Difference between Mean Scores of Select Variables for the Relevant Subsamples

Sub sample	Achievement in Language		Achievement in Physics		Comparison of Achievement C.R.
	Mean	S.D	Mean	S.D	
Boys	47.15	18.37	50.50	18.80	2.32*
Girls	44.79	21.75	51.20	20.60	3.52**
Government schools	40.00	19.06	47.70	20.40	3.83**
Private schools	49.00	19.90	52.30	19.10	2.43*
Urban schools	47.40	20.40	50.60	20.00	1.92*
Rural schools	44.90	19.50	51.00	19.30	3.90**

** significant at 0.01 level , * significant at 0.05 level.

The result showed that significant difference existed between the mean scores of Achievement in Physics and Achievement in Language within subsamples boys, girls, government schools, private schools, urban schools and rural schools. Within boys the critical ratio was 2.32, within urban schools the critical ratio was 1.92 and within private schools the critical ratio was 2.43. For all the three cases the level of significance was at 0.05. The critical ratio obtained for the test of significance of difference between mean scores within girls, within government schools and within rural schools were 3.52, 3.83 and 3.90 respectively. These values are greater than the limit set for 0.01 level of significance. This shows that all selected subsamples differ significantly in their Achievement in Language and Achievement in Physics. The critical ratio showed that Achievement in Physics and Achievement in Language differ significantly within subsamples.

Difference between Mean Scores of High, Average and Low Achievers in Language with Achievement in Physics

The difference between the mean scores of High, Average and Low Achievers in Language with respect to their Achievement scores in Physics was investigated by comparing the mean scores of the three groups of physics taken two groups at a time. The mean of Achievement in Physics of pupils belonging to High, Average and Low Achieving groups in Languages were classified on the basis of means and S.D s of scores of Achievement in Language. The summary of the test is given in Table 4.

Table 4. Summary of Data and Result of Test of Significance of Difference between Mean Scores of Achievement in Physics with High, Average and Low Achievement in Language Group

Sl. No.	Variable	Groups Compared	N	Mean	S.D	Critical Ratio
1.	Achievement in Physics	High Achievement in Language	111	70.8	16	11.57**
		Average Achievement in Language	383	50.7	16.5	
2.	Achievement in Physics	High Achievement in Language	111	70.8	16	22.54**
		Low Achievement in Language	106	30.4	9.8	
3.	Achievement in Physics	Average Achievement in Language	383	50.7	16.5	15.96**
		Low Achievement in Language	106	30.4	9.8	

The results showed that Significant difference exist in the mean scores of Achievement in Physics for the three levels of Achievement in Language (High, Average and Low) groups. The group having high Achievement in Language had high Achievement in Physics also, the group having average Achievement in Language had a corresponding level of Achievement in Physics also and the group having low Achievement in Language had a low Achievement in Physics.

CORRELATION ANALYSIS

The extent of relationship between Achievement in Physics and Achievement in Language was measured using Pearson's product Moment Coefficient of Correlation. For interpreting 'r' in addition to verbal interpretation, indices like level of significance, and confidence intervals were also calculated. Each of the coefficient of correlation 'r' was tested for significance. Details are presented in Table 5

Table 5. Details of the Relationship between Achievement in Physics and Achievement in Language for Total Sample and selected subsamples.

Sl. No.	Variables Compared	Samples	r	% Overlap	Confidence Interval		Level of Significance
					Upper limit	Lower limit	
1.	Achvt. in Physics Achvt. in Language	Total	0.71	50.41	.762	.658	0.01
2.	Achvt. in Physics Achvt. in Language	Boys	0.65	42.25	.732	.568	0.01
3.	Achvt. in Physics Achvt. in Language	Girls	0.77	59.29	.834	.706	0.01
4.	Achvt. in Physics Achvt. in Language	Govt.	0.77	59.29	.846	.694	0.01
5.	Achvt. in Physics Achvt. in Language	Private	0.68	46.24	.749	.611	0.01
6.	Achvt. in Physics Achvt. in Language	Urban	0.77	59.29	.831	.709	0.01
7.	Achvt. in physics Achvt. in Language	Rural	0.64	40.96	.727	.553	0.01

The coefficient of correlations between Achievement in Physics and Achievement in Language for total sample and selected subsamples of boys and girls, government and private and urban and rural suggested that the relationships between these variables for all the samples were real and it could be verbally interpreted as substantial or marked. In all cases the values of 'r' were positive indicating that any Achievement in Language would result in an increase in the Achievement in Physics and vice versa. All the critical ratios were found to be greater than 0.01 level of significance.

CONCLUSION AND INTERPRETATION

The analysis revealed that there exist significant difference in the mean scores of Achievement in Physics and Achievement in Language for total samples and selected subsamples boys and girls, government and private and urban and rural. There exist significant difference in the mean scores of Achievement in Physics for the three levels (high, average, low) of Achievement in Language.(P <0.01). The correlation analysis between the

Achievement in Physics and Achievement in Language for total sample and selected subsamples boys and girls, government and private and urban and rural showed that the obtained 'r' were significant at 0.01 level and in all cases it was positive. The correlation analysis for the three levels (high, average, low) of Achievement in Language with Achievement in Physics for total sample and selected subsamples of boys and girls, government and private and urban and rural were found to be significant at 0.01 level and positive in all the cases.

The findings revealed that the better the Achievement in Language the more the Achievement in Physics and vice versa. It was clear that the high Achievement in Language would enhance the Achievement in Physics and the correlation was highly significant and positive in nature. Hence parents and teachers should give ample opportunities for the child for the development of language of various types so that it will be easier for the child to deal with situations that the child may confront later. For the development of morale and values the language serves as an important means. That is why in the new two-year B.Ed. curriculum not only language of different disciplines are incorporated but also given stress to the colloquial language; which in turn will reach the hands of future citizens. In order to develop pupil's individual abilities Pupil should be provided with ample opportunities to take part in science fairs, exhibitions, seminars, quiz competition and other extra curricular activities along with internet and computer facilities for enhancing their personal capacities through language ability, subject knowledge and computer skill.

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