

Academic Achievement of Senior Secondary School Students in Relation to their Gender and Differential Levels of Reasoning Ability

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Abstract

In the present study the investigator has made an attempt to study the academic achievement of 10+1 class science students in relation to their gender and differential levels of reasoning ability. A sample of 200 students of class 10+1 (100 males, 100 females) from different government (5) senior secondary school of Mandi district were taken. For collecting data reasoning ability test (RAT) developed by L.N. Dubey and scores in final examination (10th) was taken as academic achievement of the student. Results of analysis of variance revealed that there was significant difference in the academic achievement of 10+1 class students belonging to high, average and low reasoning ability groups; reasoning ability affects the academic achievement of 10+1 class science and was not affected by the interactional effect of gender and reasoning ability.

KEYWORDS: Academic Achievement, Reasoning Ability, Differential level

INTRODUCTION

The concept of achievement was put forward by 'Murray'. It means all the behavioral change or learning outcomes which are expressed in terms of knowledge, understanding and skills. Academic achievement is related to the acquisition of principals and generalization and the capacity to perform efficiently certain manipulations, objectives, symbols and ideas. It is the competence of student's shows in school subjects for which they have taken instruction. The test scores or grades assigned to the students on the basis of their performance in the achievement test determine the status of pupils in the classroom (Singh et al., 2007).

Reasoning is a process of controlled thinking, an association which starts with some problem of interest to the reasoner and is directed towards its solution. It is the highest form of thinking that needs a well organized brain. Reasoning is much like trial and error behaviour but instead of motor exploration it is mental exploration. Reasoning is the word used to describe the mental recognition of cause and effect relationship. It may be the prediction of an observed cause or the inference of a cause from an observed event (skinner 1968).

Academic achievement and reasoning ability have an unavoidable relationship. Maximum studies have associated high reasoning ability with high academic achievement. Reasoning ability positively affect academic achievement of an individual.

Related literature showed that large number of studies was conducted on reasoning ability. Most of studies revealed unavoidable relationship between reasoning ability and academic achievement. Researchers like Jain (1979), Singh (1983), Chhikara (1988), Dubey (2007) and Arumugarajan (2008) had reported positive and significant relationship whereas Ruchi Dubey in 2010 found that formal reasoning is not related to achievement in English and Hindi.

Objective

- To study and compare the academic achievement of +1 class science students having high, average and of +1 levels of reasoning ability.
- To study the interactional effect of gender and reasoning ability on academic achievement of 10+1 class science students.

Sample

The study was conducted on a sample of 200 students of 10+1 from senior secondary schools of Mandi district affiliated to H.P.S.B Dharmshala.

The sample consists of males (100) and female (100) of 10+1 govt. school. The sample was selected through random sampling techniques.

Test

Reasoning ability test (RAT) (L.N. Dubey was used.

Procedure

Descriptive survey method of research was employed for the present study. Reasoning ability test was employed on the students of 10+1 class. The data for the present research was collected personally by the investigator from government (5) school included in the sample. Data from students was collected at the terminal stage of the academic session 2010-2011.

Group Formation

Out of total number of 200 students only 120 students on basis of high average and low reasoning ability ($m+11_2SD$) were taken in final sample. Six groups of 20 students each were formed.

Table 1
Mean scores of Academic Achievement

Reasoning Ability	Male	Female	Total
High	9676	10760	20436
Average	8665	9546	18211
Low	9030	9252	102882
Total	27371	29558	56929

From table 1, it can be seen that the mean academic achievement score of female ($29558/60$) 492.63 is significantly higher than that of male students ($27371/60$) 456.18. This leads to conclude that the academic achievement of female students is higher as compared to the academic achievement of male students.

Table 2
Analysis of Variance

Square of variation	Sum of square	df	Mean square	F
Between treatment	129974.04	5	25994.81	6.92*
Within treatment	428264.95	114	3756.71	
Total	558238.99	119		

*Significant at 0.01 level

As the table 2 shows, testing the treatments mean square for significance the ‘F’ value is 6.92 from this table, it is seen that for df 5 and 114, ‘F’ value is 6.92 is significant at 0.01 level of significance. Thus it can be inferred that treatment means differ significantly.

Table 3
The complete summary of Analysis of Variance for Academic Achievement

Source of Variation	Sum of Square	df	Mean Square	F
Gender (A)	39858.08	1	39858.08	10.60*
Reasoning (B) ability	79961.51	2	39980.75	10.64*
AXB (Gender X Reasoning ability)	10154.45	2	5077.23	1.35

Error	428264.95	114	3756.71	
Total	558238.99	119		

*Significant at 0.01 level.

The table 3 shows that 'F' value for the main effect of gender on academic achievement came to be 10.60 which is significant at 0.01 level of confidence for 1/114df. From this it is interpreted that there is significant difference in academic achievement of +1 class male and female science students.

The table 3 shows that 'F' value for the main effect of reasoning ability on academic achievement has came out to be 10.64, which is significant at 0.01 level of confidence for 2/114df. From this it may be interpreted that there is a significant effect of reasoning ability on the academic achievement of +1 class science students.

Further to locate the difference in the academic achievement of three groups of student's i.e. high, average and low reasoning ability, t-test is employed. The results of t-test are given in table as under:-

Table 4
Means, SDs and t-value for Comparing Different Groups

GROUP	MEAN	SD	N	t-value
High	510.9	64.00	40	3.72*
Average	455.27	69.53	40	
High	510.9	64.00	40	4.0*
Low	457.27	55.05	40	
Average	455.27	69.53	40	0.12
Low	457.05	55.05	40	

*significant at 0.01 level of confidence

From table 4 it can be seen that, t-value for comparing the academic achievement of high and average reasoning ability having students has came out to be 3.72 which is significant at 0.01 level of confidence for 1/78df. From this is interpreted that academic achievement of +1 class science students differs significantly having high and average reasoning ability.

It can be seen from the table 4 that t-value for comparing the academic achievement of students having high and low reasoning ability has came out to be 4.0 which is significant at 0.01 level of confidence for 1/78df. From this it may be interpreted that academic achievement of +1class science students differs significantly among high and low students.

Further t-value for comparing academic achievement of students having average and low reasoning ability has came out to be 0.12 which is not significant even at 0.05 level of confidence. From this it may be interpreted that academic achievement of students having average and low reasoning ability do not differs significantly.

From the trend of Means it can be said that the academic achievement of students having high reasoning ability was significantly higher than the students having average and low reasoning ability.

Interactional Effect

The 'F' value for AXB interaction is equal to 1.35 which is not significant even at 0.05 level of confidence for 2df and 114df. It indicates that academic achievement of +1 class science students is not affected by the interactional effect of reasoning ability and gender.

Conclusion

We can conclude by saying that education is the process of development. Academic achievement is an aspect of behaviour which is important for students engaged in the process of education. Academic achievement is end product of all the education processes and reasoning is one of basic ingredient of educational process. Above stated findings of the study reveals that the +1 class science student's having high, average and low levels of reasoning ability differ significantly with respect to their mean academic achievement. Therefore, we can say that reasoning ability is related to academic achievement and in order to raise the academic achievement of the student's teachers should pay attention towards exploring new methods to increase and develop reasoning ability.

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