

RELATIONSHIP BETWEEN DEVIATION I.Q. AND ACHIEVEMENT IN PHYSICAL SCIENCE OF SECONDARY STUDENTS IN CASE OF LEARNING DISABILITIES

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ABSTRACT

Learning Disabilities are traditionally diagnosed by conducting two tests and noticing a significant discrepancy between their scores. These tests are an intelligence (or IQ) test and a standardized achievement test. Most children found to have a learning disability have normal or above-normal intelligence but do not fully demonstrate that potential on achievement test. This paper presents a relation between I.Q. and Achievement in Physical Science in case of Learning Disabilities.

Sixty sample from two schools of north 24 parganas, West Bengal are taken for this study (thirty male and thirty female students of them thirty are urban (s₁) and thirty are rural (s₂). Variables are IQ & Achievement; male & female; rural & urban. Random sampling technique is used. Method adapted is survey. As statistical technique mean, rank difference and graphical re-presentations are used.

The findings are as: i) Relationship between deviation I.Q. and Achievement in Physical Science of secondary students for both urban and rural are highly significant.

ii) For both S1 and S2 schools the relationship between deviation I.Q. and Achievement in Physical Science of secondary students are highly satisfactory.

iii) The relationship between Achievement in Physical Science of Secondary Students and deviation IQ in case of total male and total female students are not significantly high.

Key words: Deviation IQ, Achievement in Physical Science, rank difference, co-relation, Learning Disabilities.

1. INTRODUCTION

The term learning disability indicates limited ability in learning. It refers to retardation, disorder or delayed development in any one or more processes of speech, language, reading, spelling, writing or arithmetic. Although a learning disability may occur concomitantly with other handicapping conditions (e.g. sensory impairment, mental retardation and emotional disturbance) or environmental influences (e.g. cultural difference, insufficient and inappropriate instructions, psychological factors) but it is not the direct result of the conditions or influences.

Students having learning disabilities can seem scarcely at initial condition. But it has not related to person's intelligence or motivation. Children with learning disabilities are not lazy or dumb at all. Too many successful people such as *Thomas Alva Edison*, *Alexander Graham Bell*, *Walt Disney*, *Winston Churchill*, Steven Spielberg, Steve Jobs and many more famous persons have suffered from learning disabilities.

Learning disabilities arise from neurological differences in brain structure and function and affect a person's ability to receive, store, process, retrieve or communicate information. Frequently, learning disabilities are not detected before children start school. Many students with learning disabilities display no signs of difficulty, except when they attempt the specific academic tasks that challenge their particular area of cognitive processing difficulty.

Intelligence tests measure thinking and problem-solving skills. They can show what a child's intellectual potential is. Achievement tests measure what that child knows and can actually do. A statistically significant difference between ability and achievement generally points to a learning disability. A formal psychological evaluation examines discrepancies between ability (IQ) and achievement to determine if a learning disability exists and to what severity. This paper presents the relationship between deviation I.Q and Achievement in Physical Science of secondary students in case of Learning disabilities.

2. OBJECTIVES

To study i) the relationship between deviation IQ and Achievement in Physical Science of Secondary level in case of urban and rural students with reference to learning disabilities.

ii) the relationship between deviation IQ and Achievement in Physical Science of Secondary level among total male and female students of the two schools (S1 & S2) with reference to learning disabilities.

iii) the relationship between deviation IQ and Achievement in Physical Science of Secondary level among male and female students of each school.

3. HYPOTHESES

H₀1: There exists no significant relationship between deviation IQ and Achievement in Physical Science of secondary level in case of urban and rural students with reference to learning disabilities.

H₀2: There exists no significant relationship between deviation IQ and Achievement in Physical Science of secondary level among total male and female students of the two schools with reference to learning disabilities.

H₀3: There exists no significant relationship between deviation IQ and Achievement in Physical Science of secondary level among male and female students of each school (i.e. S1 & S2).

4. METHODOLOGY

Relationship between Deviation I.Q. and Achievement in Physical Science of Secondary Students in Case of Learning

4.1 Population: Learning disabled students of class X of West Bengal Board of Secondary Education were considered as population for this study. **4.2 Sample:** Sixty students from two schools (S1 & S2) of urban and rural area were taken. Fifteen male and fifteen female students were taken from each school. Two schools are situated in the district of North 24 Parganas, West Bengal. **4.3 Method:** Survey method was adopted for this study. **4.4 Variables:** 1) Deviation I.Q., 2) Achievement in Physical Science of secondary level, 3) Male, 4) Female, 5) Rural, 6) Urban. **4.5 Tools & Techniques:** 1) Mixed Type Group Test Of Intelligence (Verbal & Non-verbal); Standarised by Dr. P.N.Mehrotra, Retired Professor, Moradabad (2008). 2) Teacher made Achievement Test in Physical Science of Secondary level students (Made by the investigators 3) Statistical Analysis (Mean and Rank Difference co-relation). **4.6 Procedure:** 1) The present test of Intelligence consists of a work of 20 minutes only (10 minutes each for verbal and non-verbal test). This test was administered by the investigator within a period of one and half hour in class-X of two schools, consisting of thirty students in each school. 2) Teacher made Achievement Test of Physical Science (Objective Type, F. M. - 100, Time – 1 hour) was administered by the investigator in class-x of two schools, consisting of thirty students in each school. Students are selected from the schools (S1 school and S2 school) randomly. **4.7 Collection of Data:** The scores of Deviation I.Q. of Verbal Test and Non-Verbal test of S1 & S2 schools are:

Table 1 S1 school (URBAN) and S2 school (RURAL), (Category – Male & Female):

CN = Stands for Code Number of students

AT= Stands for Achievement Test Score

IQ = Stands for Intelligence Quotient Score

S1 School (Total Students)								S2 School (Total Students)						
CN	AT	IQ		CN	AT	IQ		CN	AT	IQ		CN	AT	IQ
01	36	41		16	46	42		01	42	39		16	36	28
02	25	30		17	56	52		02	44	37		17	25	18
03	33	38		18	54	48		03	41	34		18	33	27
04	34	40		19	53	48		04	39	31		19	34	28
05	32	38		20	31	38		05	28	22		20	32	29
06	26	32		21	35	40		06	29	24		21	26	22

CN	AT	IQ		CN	AT	IQ		CN	AT	IQ		CN	AT	IQ
07	29	35		22	30	36		07	38	30		22	29	23
08	25	31		23	27	31		08	28	24		23	25	20
09	29	34		24	23	29		09	29	24		24	29	24
10	29	33		25	24	31		10	38	31		25	34	27
11	33	40		26	28	34		11	37	30		26	46	36
12	34	33		27	22	29		12	35	28		27	22	18
13	32	38		28	17	22		13	30	25		28	31	26
14	40	42		29	21	24		14	24	18		29	35	28
15	20	24		30	18	21		15	28	22		30	27	22

Table 2 S1 school (URBAN); (Category – Male and Female)

CN = Stands for Code Number of students

AT= Stands for Achievement Test Score

IQ = Stands for Intelligence Quotient Score

S1 School (Category – Male & Female)																
M A L E	CN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	AT	36	25	33	34	32	26	29	25	29	29	33	34	32	40	20
	I.Q.	41	30	38	40	38	32	35	31	34	33	40	33	38	42	24
F E M A L E	CN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	AT	46	56	54	53	31	35	30	27	23	24	28	22	17	21	18
	I.Q.	42	52	48	48	38	40	36	31	29	31	34	29	22	24	21

Table 3 S2 school (RURAL), (Category – Male and Female):

CN = Stands for Code Number of students

AT= Stands for Achievement Test Score

IQ = Stands for I. Q. Score

S2 School (Category – Male & Female)																
M A L E	CN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	AT	42	44	41	39	28	29	38	28	29	38	37	35	30	24	28
	I.Q.	39	37	34	31	22	24	30	24	24	31	30	28	25	18	22
F E M A L E	CN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	AT	36	25	33	34	32	26	29	25	29	34	46	22	31	35	27
	I.Q.	28	18	27	28	29	22	23	20	24	27	36	18	26	28	22

Table 4 S1 school (URBAN) and S2 school (RURAL), (Category – Total Male):

CN = Stands for Code Number of students

AT= Stands for Achievement Test Score

IQ = Stands for I. Q. Score

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S1 School & S2 School (Category – Male)																	
M A L E	S1 school	CN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		AT	36	25	33	34	32	26	29	25	29	29	33	34	32	40	20
		I.Q.	41	30	38	40	38	32	35	31	34	33	40	33	38	42	24
	S2 school	CN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		AT	42	44	41	39	28	29	38	28	29	38	37	35	30	24	28
		I.Q.	39	37	34	31	22	24	30	24	24	31	30	28	25	18	22

Table 5 S1 school (URBAN) and S2 school (RURAL), (Category – Total Female):

CN = Stands for Code Number, AT= Stands for Achievement Test Score, Q = Stands for I.Q. Score

S1 School & S2 School (Category – Female)																	
F E M A L E	S1 school	CN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		AT	46	56	54	53	31	35	30	27	23	24	28	22	17	21	18
		I.Q.	42	52	48	48	38	40	36	31	29	31	34	29	22	24	21
	S2 school	CN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		AT	36	25	33	34	32	26	29	25	29	34	46	22	31	35	27
		I.Q.	28	18	27	28	29	22	23	20	24	27	36	18	26	28	22

Table 6 (Statistical Table)

S1 school (URBAN) and S2 school (RURAL), (Total students including All Male & Female):

S1 School (All Male & Female)				S2 School (All Male & Female)			
Mean Ach	Mean I.Q.	Mean Deviation of I.Q.	ρ (Rank difference co-relation)	Mean Ach	Mean I.Q.	Mean Deviation of I.Q.	ρ (Rank difference co-relation)
31.4	35.1	89	0.99	32.5	26.5	81	0.98

Table 7 (Statistical Table):

S1 school (URBAN); (Category – Male and Female):

S1 School (Male)				S1 School (Female)			
Mean Ach	Mean I.Q.	Mean Deviation of I.Q.	ρ (Rank difference co-relation)	Mean Ach	Mean I.Q.	Mean Deviation of I.Q.	ρ (Rank difference co-relation)
30.5	35.3	89	0.89	32.3	35	89	0.99

Table 8 (Statistical Table)

S2 school (RURAL); (Category – Male and Female):

S2 School (Male)				S2 School (Female)			
Mean Ach	Mean I.Q.	Mean Deviation of I.Q.	ρ (Rank difference co-relation)	Mean Ach	Mean I.Q.	Mean Deviation of I.Q.	ρ (Rank difference co-relation)
34	27.9	82	0.98	30.9	25	80	0.94

Table 9 (Statistical Table):

S1 school (URBAN) and S2 school (RURAL), (Category – Total Male + Total Female) –

S1 + S2 School (Total Male)				S1 +S2 School (Total Female)			
Mean Ach	Mean I.Q.	Mean Deviation of I.Q.	ρ (Rank difference co-relation)	Mean Ach	Mean I.Q.	Mean Deviation of I.Q.	ρ (Rank difference co-relation)
32.23	31.6	85	0.56	31.63	30.03	84	0.67

Graph: 1 - S1 school (URBAN); (Total Students -- Male and Female):

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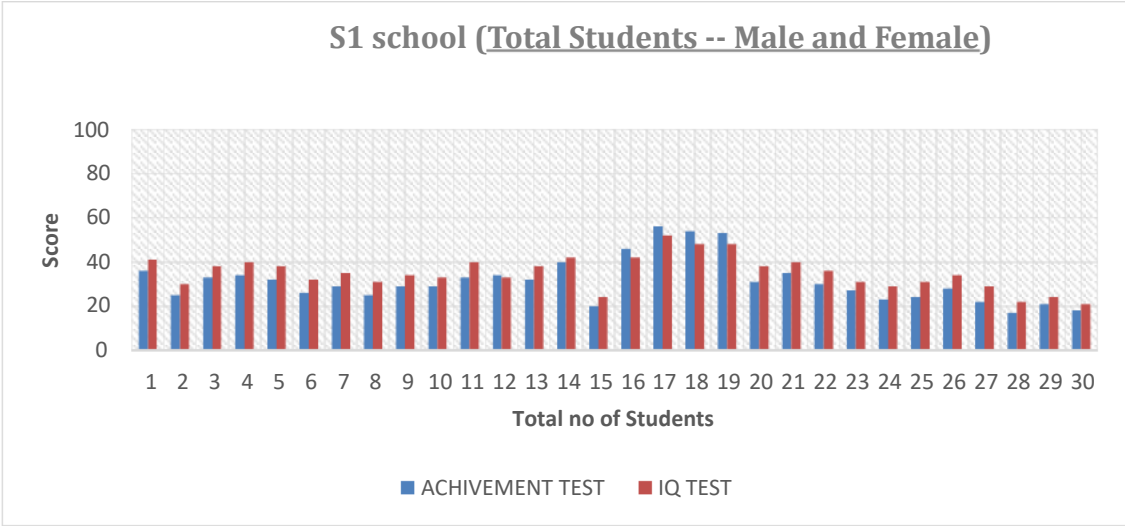


Figure 1

Graph: 2 - S2 school (RURAL), (Total Students -- Male and Female):

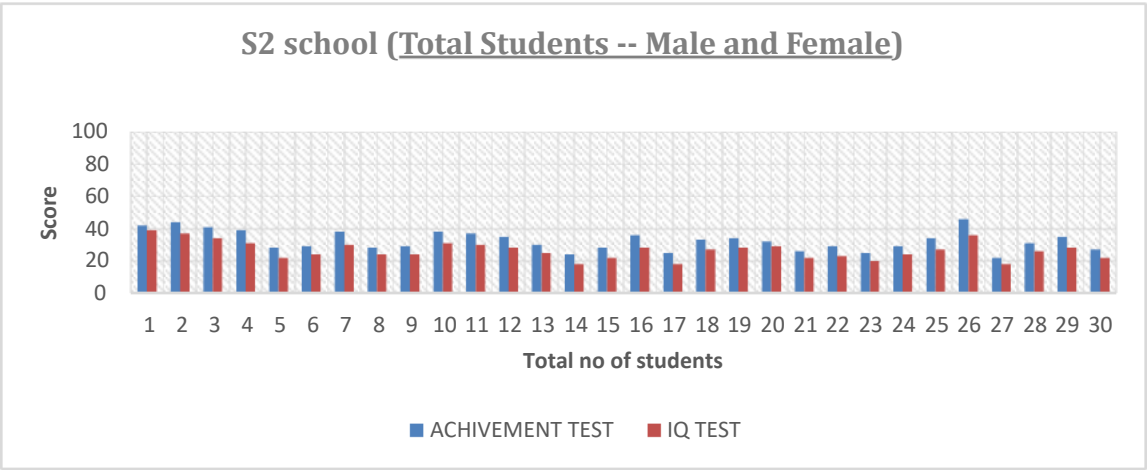


Figure 2

Graph: 3 - S1 school Urban, (Category – Male):

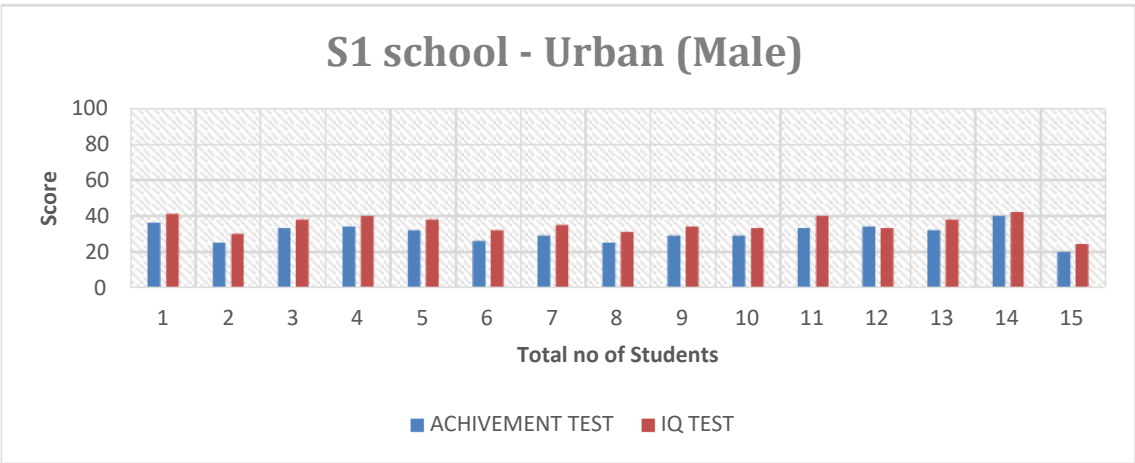


Figure 3

Graph: 4 -- S1 school Urban, (Category – Women):

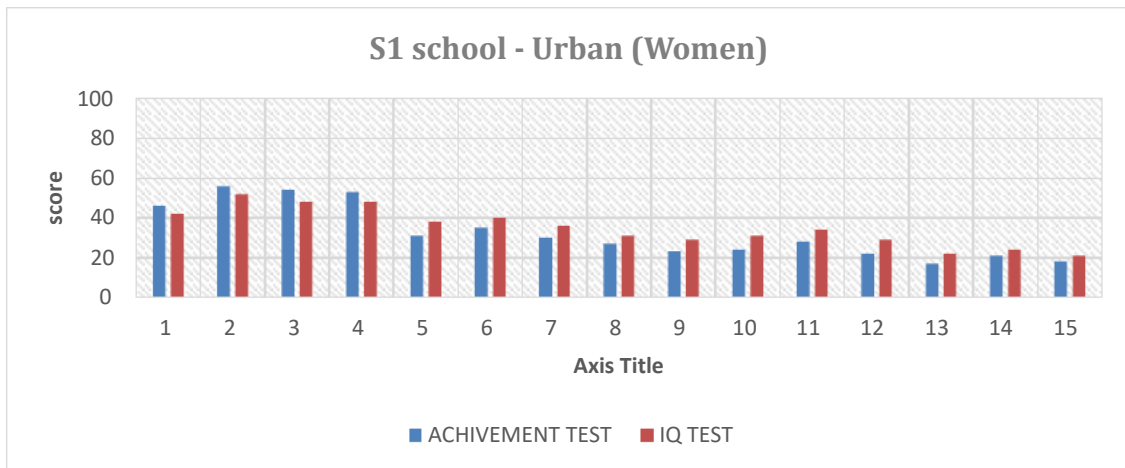


Figure - 4

Graph: 5 -- S2 school Rural, (Category – Men):

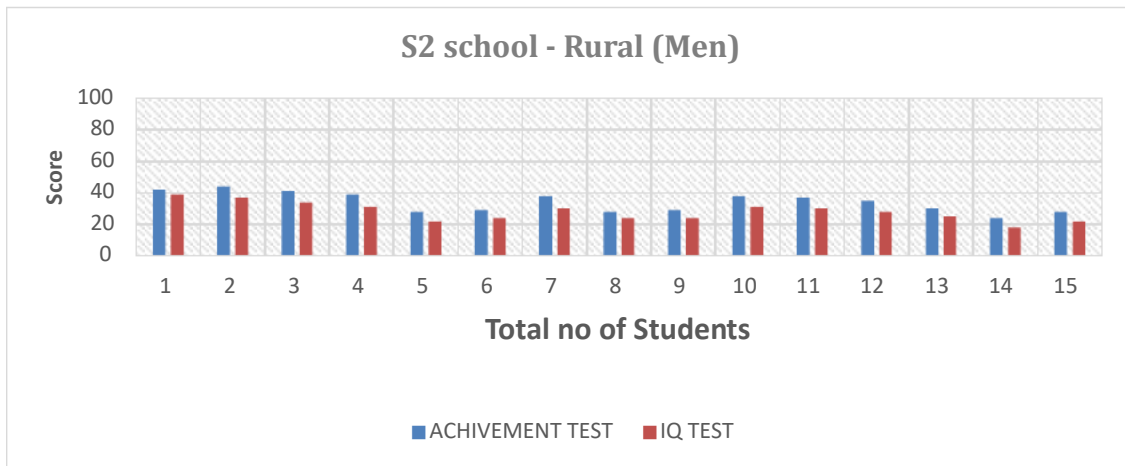


Figure 5

Graph: 6 - S2 school Rural, (Category – Women):

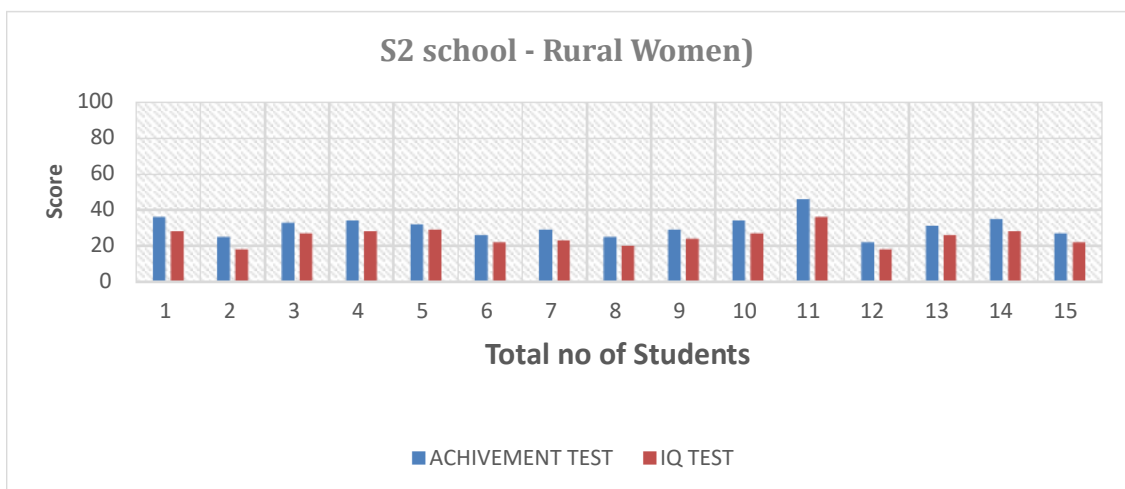


Figure 6

Relationship between Deviation I.Q. and Achievement in Physical Science of Secondary Students in Case of Learning

Graph: 7: S1 & S2 school (Urban + Rural); (Category – Total Men):

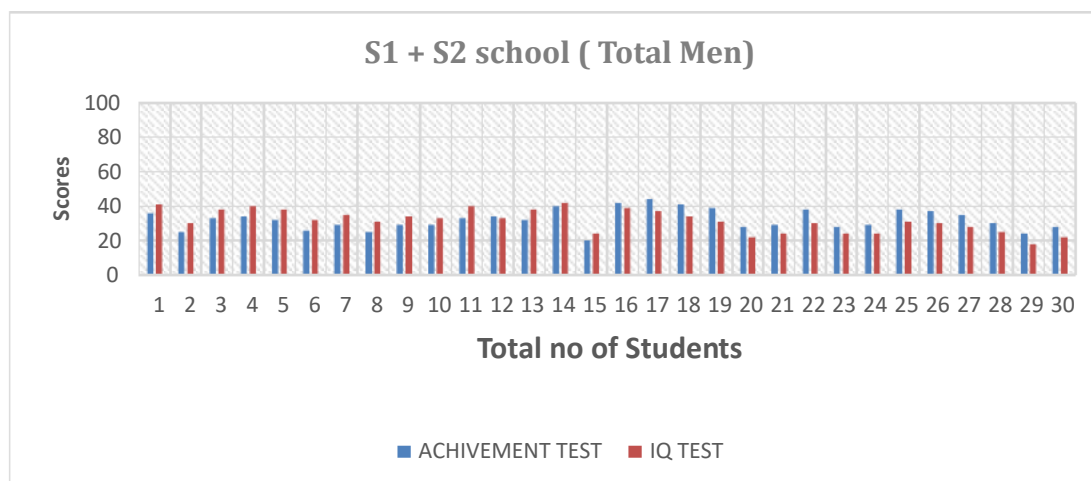


Figure 7

Graph: 8 S1 & S2 school (Urban + Rural); (Category – Total Women):

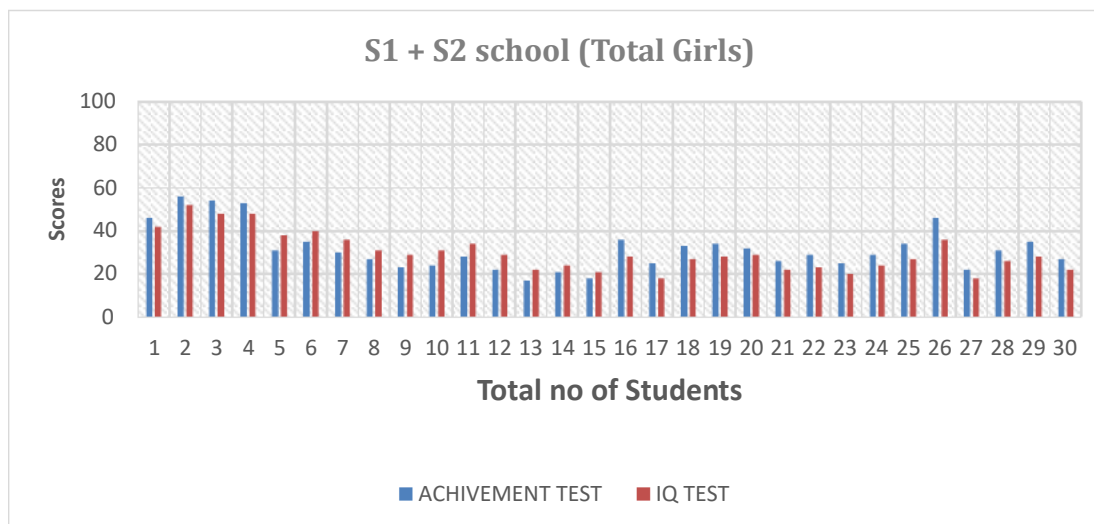


Figure 8

5. INTERPRETATION OF DATA

From Table -1 represents the Data containing Achievement in Physical Science of secondary level and IQ of total students (both Male and Female) of S1 School (Urban) and S2 School (Rural), Table – 2 represents the Data containing Achievement and IQ of students of S1 School (Urban), Table – 3 represents the Data containing Achievement and IQ of students of S2 School (Rural), Table – 4 represents the Data containing Achievement and IQ of students (total male students) of S1 School (Urban) and S2 School (Rural) , Table – 5 represents the Data containing Achievement and IQ of students (total Female students) of S1 School (Urban) and S2 School (Rural)).

From Table – 6 it is found that Mean Achievement in Physical Science of secondary level in case of total students S1school (Urban) is less than Mean Achievement in Physical Science in case of total students S2 school (Rural) but Mean IQ and Mean Deviation of IQ in case of S1school (total students) are less than S2 school total students. It is also found that Rank co-relation for total students of both School are highly significant ($\rho=0.99$ for male and $\rho=0.98$ for

female). From the mean deviation IQ values of total students of S1 school and S2 school are Dull Average (80-90) (obtained from the table of the Mixed Type Group Test of Intelligence).

From Statistical Table - 7 it is found that Mean Achievement in Physical Science in case of S1 school (Urban) Male is less than S1 school Female but mean IQ of S1 school Male is somewhat greater than mean IQ of Female students of the same school. Mean Deviation of IQ in case of S1 school of male and female students are almost equal. It is also found that rank co-relation values of both male and female students are also highly significant ($\rho=0.89$ for male and $\rho=0.67$ for female). From the table of the Mixed Type Group Test of Intelligence the nature of both male and female students of S1 school is Dull Average (80-90).

From Statistical Table - 8 it is found that Mean Achievement in Physical Science in case of S2 school (Rural) Male is greater than S2 school Female but mean IQ of S2 school Male are greater than mean IQ of Female students of the same school. Mean Deviation of IQ in case of S2 school of male students is greater than female students. Rank co-relation values of both male and female students of S2 school are also highly significant ($\rho=0.98$ for male and $\rho=0.94$ for female). From the table of the Mixed Type Group Test of Intelligence the nature of both male and female students of S1 school is Dull Average (80-90).

From Table – 9 it is found that Mean Achievement in Physical Science in case of Total Male students of both schools (S1+S2) is greater than Mean Achievement in Physical Science in case of both school (S1 +S2) but Mean IQ and Mean Deviation of IQ in case of Male Students of both schools are higher than total Female students of both schools. It is also found that Rank co-relation for total students of both School are average ($\rho=0.56$ for total male and $\rho=0.67$ for total female). From the mean deviation IQ values of total students of S1 school and S2 school are Dull Average (80-90) (obtained from the table of the Mixed Type Group Test of Intelligence).

From **Fig. – 1** it is found that for S1 school (Total Students - Urban) most of the cases value of IQ is slightly greater than value of Achievement in Physical Science.

Fig. – 2 represents that value of IQ is slightly less than value of Achievement in Physical Science for S2 school (Total Students – Rural).

Fig. – 3 shows that the IQ values of Urban Boys (S1 school) is slightly greater than the value of achievement in Physical Science.

From **Fig. – 4** it is found that except that first four cases the IQ values of Urban girls (S1 school) is slightly greater than the value of achievement in Physical Science.

Fig. – 5 represents that value of IQ is slightly less than value of Achievement in Physical Science for S2 school (Rural – Boys).

Fig. – 6 shows that value of Achievement in physical Science is slightly greater than value of IQ for all rural girls (S2 school).

Fig. – 7 shows that the values of IQ for first 15 girls' students are slightly greater than values of Achievement in Physical Science and for the rest 15 girls' students' value of Achievement in Physical Science is slightly than IQ value (All boys students – S1&S2 schools).

Fig. – 8 shows that the value of Achievement for first 4 students and last 15 students are slightly greater than that of IQ values (All girls students – S1&S2 schools).

6. CONCLUSION

Relationship between Deviation I.Q. and Achievement in Physical Science of Secondary Students in Case of Learning

From the Interpretation of the data which are represented by different Tables and Figures, it is concluded that a) the relationship between IQ and Achievement in case of urban and rural students with reference to learning disabilities, b) the relationship between IQ and Achievement among total male and female students of the two schools with reference to learning disabilities, c) the relationship between IQ and Achievement among male and female students of each school are highly positive (Rank different co-relation values). All the students (S1 & S2 school, Rural and Urban) are dull average.

The opinion of the investigators are i) to teach the students in Physical Science by proper Teaching Method like Power Point presentation and experimentation. ii) to apply continuous evaluation process for the improvement in Achievement test.

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