*IOSR Journal Of Humanities And Social Science (IOSR-JHSS)*
*Volume 24, Issue 11, Series. 4 (November. 2019) 63-70*
*e-ISSN: 2279-0837, p-ISSN: 2279-0845.*
*www.iosrjournals.org*

# Is Intelligence Quotient (I.Q,) The Predictor of Achievement in Physical Science of Learning-Disabled students In Secondary Level?

Koushik Halder[1], Dr. Debashis Dhar[2], Dr. Udayaditya Bhattacharya[3]
[1]*Research Scholar, Department of Education, Jharkhan Rai University, Ratu Road, Chanakyapuri Colony, Kamre, Ranchi, Jharkhand, India,*
[2]*Principal, Sanjay College of Education, Vill + P.O. – Brindabanchak, P.S.- Panskura, Dist.- Purba Medinipur, West Bengal, Pin-721641. India,*
[3]*Ex-principle, G.C.M.College of Educaion, New Barrackpur, West Bengal, India,*
*Corresponding Author: Koushik Halder*

**Abstract:** Learning Disabilities are diagnosed by conducting two tests (an intelligence test and a standardized 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 urbanand thirty are rural. Method adapted is survey. As statistical technique mean, rank difference and graphical re-presentations are used.
Finding: I.Q. is the predictor of Achievement in Physical Science of Learning-Disabled students in secondary level.

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

---

Date of Submission: 04-11-2019 Date of Acceptance: 20-11-2019

---

## I. INTRODUCTION

Educationis considered as a fundamental right of every child. But a large number of children have problems in reading, handwriting, spelling, mathematics, listening, expressive language, and social skills. Among them children with learning disabilities find difficulties in acquiring basic academic skills from school educational system. Children with learning disabilities may have problems in reading, writing, spelling and doing mathematics. These children are endowed but ignored by the personnel involved in the educational system. Unfortunately, enough awareness has not been generated among the teachers and parents and the absence of adequate educational programme has long deprived the nation of latent potential in their children. Management of curriculum for children with Learning Disability in the regular school is a challenge for teachers. Learning Disability is the major cause of school dropout, poor academic achievement status etc.

Learning disability is a condition in which one or more of the basic psychological processes in understanding or using language are deficient. The term learning disability indicates limited ability in learning. The term learning disability 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.

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.

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.

## II. OBJECTIVES

To study i) whether any relationship exists between deviation IQ and Achievement in Physical Science of Secondary level in case of urban and rural students with reference to learning disabilities.
ii) whether any relationship exists 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) whether any relationship exists betweendeviation IQ and Achievement in Physical Science of Secondary level among male and female students of two school (separately).

## III. HYPOTHESES

**$H_0$1:** There exists no significant relationship between deviation IQ and Achievement in Physical Science of secondary level in case of urban and rural students with reference to learning disabilities.
**$H_0$2:**There exists no significant relationship between deviation IQ and Achievement in Physical Science of secondary level among total male and female students of the two schools with reference to learning disabilities.
**$H_0$3:** 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).

## IV. METHODOLOGY

**4.1Population:** 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 24Parganas, West Bengal**.**
**4.3Method:** Survey method was adopted for this study.
**4.4Variables:** 1) Deviation I.Q., 2) Achievement in Physical Science of secondary level, 3) Male, 4) Female, 5) Rural, 6) Urban.
**4.5Tools &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).
**4.6Procedure:** 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** | 46 | 49 | | **16** | 65 | 61 | **01** | 54 | 52 | | **16** | 58 | 55 |
| **02** | 35 | 40 | | **17** | 62 | 58 | **02** | 61 | 64 | | **17** | 64 | 61 |
| **03** | 43 | 48 | | **18** | 60 | 58 | **03** | 52 | 53 | | **18** | 55 | 51 |
| **04** | 38 | 41 | | **19** | 63 | 60 | **04** | 49 | 52 | | **19** | 46 | 42 |
| **05** | 36 | 39 | | **20** | 58 | 54 | **05** | 42 | 45 | | **20** | 43 | 38 |
| **06** | 51 | 55 | | **21** | 69 | 65 | **06** | 40 | 38 | | **21** | 41 | 39 |
| **07** | 57 | 58 | | **22** | 66 | 63 | **07** | 43 | 39 | | **22** | 38 | 36 |
| **08** | 63 | 59 | | **23** | 61 | 56 | **08** | 39 | 40 | | **23** | 45 | 41 |
| **09** | 53 | 54 | | **24** | 54 | 51 | **09** | 41 | 39 | | **24** | 33 | 30 |
| **10** | 51 | 53 | | **25** | 52 | 55 | **10** | 48 | 46 | | **25** | 37 | 32 |
| **11** | 50 | 47 | | **26** | 42 | 41 | **11** | 46 | 49 | | **26** | 39 | 36 |
| **12** | 44 | 49 | | **27** | 43 | 40 | **12** | 35 | 38 | | **27** | 48 | 45 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **13** | 43 | 44 | | **28** | 39 | 36 | | **13** | 45 | 41 | | **28** | 45 | 42 |
| **14** | 42 | 40 | | **29** | 45 | 49 | | **14** | 42 | 43 | | **29** | 42 | 40 |
| **15** | 49 | 53 | | **30** | 41 | 48 | | **15** | 36 | 34 | | **30** | 31 | 33 |

**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)** | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **MALE** | **CN** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** |
| | **AT** | 46 | 35 | 43 | 38 | 36 | 51 | 57 | 63 | 53 | 51 | 50 | 44 | 43 | 42 | 49 |
| | **I.Q.** | 49 | 40 | 48 | 41 | 39 | 55 | 58 | 59 | 54 | 53 | 47 | 49 | 44 | 40 | 53 |
| **FEMALE** | **CN** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** |
| | **AT** | 65 | 62 | 60 | 63 | 58 | 69 | 66 | 61 | 54 | 52 | 42 | 43 | 39 | 45 | 41 |
| | **I.Q.** | 61 | 58 | 58 | 60 | 54 | 65 | 63 | 56 | 51 | 55 | 41 | 40 | 36 | 49 | 48 |

**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)** | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **MALE** | **CN** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** |
| | **AT** | 54 | 61 | 52 | 49 | 42 | 40 | 43 | 39 | 41 | 48 | 46 | 35 | 45 | 42 | 36 |
| | **I.Q.** | 52 | 64 | 53 | 52 | 45 | 38 | 39 | 40 | 39 | 46 | 49 | 38 | 41 | 43 | 34 |
| **FEMALE** | **CN** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** |
| | **AT** | 58 | 64 | 55 | 46 | 43 | 41 | 38 | 45 | 33 | 37 | 39 | 48 | 45 | 42 | 31 |
| | **I.Q.** | 55 | 61 | 51 | 42 | 38 | 39 | 36 | 41 | 30 | 32 | 36 | 45 | 42 | 40 | 33 |

**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

| **S1 School & S2 School (Category – Male)** | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **MALE** | **S1 school** | **CN** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** |
| | | **AT** | 46 | 35 | 43 | 38 | 36 | 51 | 57 | 63 | 53 | 51 | 50 | 44 | 43 | 42 | 49 |
| | | **I.Q.** | 49 | 40 | 48 | 41 | 39 | 55 | 58 | 59 | 54 | 53 | 47 | 49 | 44 | 40 | 53 |
| | **S2 school** | **CN** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** |
| | | **AT** | 54 | 61 | 52 | 49 | 42 | 40 | 43 | 39 | 41 | 48 | 46 | 35 | 45 | 42 | 36 |
| | | **I.Q.** | 52 | 64 | 53 | 52 | 45 | 39 | 39 | 40 | 39 | 46 | 49 | 38 | 41 | 43 | 34 |

**Table– 5**

S1 school (URBAN) and S2 school (RURAL), (Category – Total Female):
CN = Stands for Code Number, AT= Stands for Achievement Test Score,
IQ = Stands for I.Q. Score

| S1 School & S2 School (Category – Female) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **F** | | **CN** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** |
| | **S1 school** | **AT** | 65 | 62 | 60 | 63 | 58 | 69 | 66 | 61 | 54 | 52 | 42 | 43 | 39 | 45 | 41 |
| **E** | | **I.Q.** | 61 | 58 | 58 | 60 | 54 | 65 | 63 | 56 | 51 | 55 | 41 | 40 | 36 | 49 | 48 |
| | | **CN** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** |
| **M** | **S2 school** | **AT** | 58 | 64 | 55 | 46 | 43 | 41 | 38 | 45 | 33 | 37 | 39 | 48 | 45 | 42 | 31 |
| | | **I.Q.** | 55 | 61 | 51 | 42 | 38 | 39 | 36 | 41 | 30 | 32 | 36 | 45 | 42 | 40 | 33 |
| **A** | | | | | | | | | | | | | | | | | |
| **L** | | | | | | | | | | | | | | | | | |
| **E** | | | | | | | | | | | | | | | | | |

**Table – 6 (Statistical Table):**

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

| **S1 School (**All Male & Female**)** | | | | | **S2 School (**All Male & Female**)** | | | |
|---|---|---|---|---|---|---|---|---|
| Mean Ach | Mean I.Q. | Deviation I.Q. | ρ (Rank difference co-relation) | | Mean Ach | Mean I.Q. | Deviation I.Q. | ρ (Rank difference co-relation) |
| 50.7 | 50.8 | 103 | 0.95 | | 44.6 | 43.13 | 97 | 0.93 |

**Table - 7 (Statistical Table):**

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

| **S1 School (Male)** | | | | | **S1 School (Female)** | | | |
|---|---|---|---|---|---|---|---|---|
| Mean Ach | Mean I.Q. | Deviation of I.Q. | ρ (Rank difference co-relation) | | Mean Ach | Mean I.Q. | Deviation of I.Q. | ρ (Rank difference co-relation) |
| 46.73 | 48.6 | 102 | 0.97 | | 54.66 | 53 | 106 | 0.968 |

**Table -8; (Statistical Table):**

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

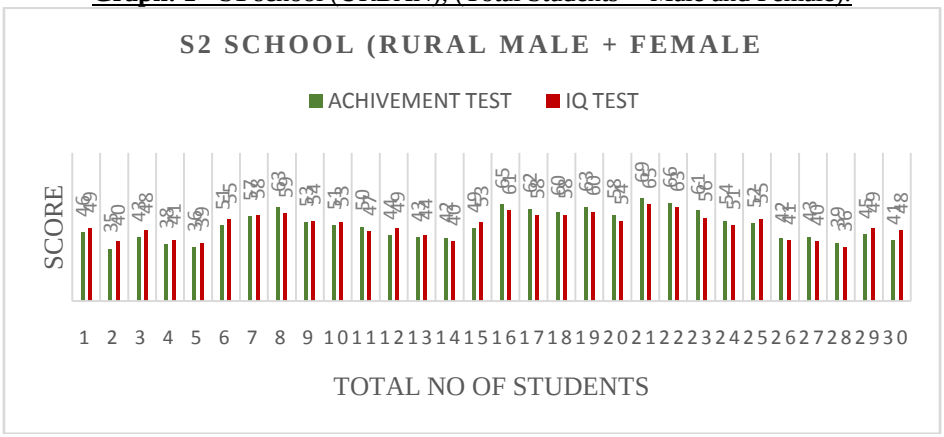
| **S2 School (Male)** | | | | | **S2 School (Female)** | | | |
|---|---|---|---|---|---|---|---|---|
| Mean Ach | Mean I.Q. | Deviation I.Q. | ρ (Rank difference co-relation) | | Mean Ach | Mean I.Q. | Deviation of I.Q. | ρ (Rank difference co-relation) |
| 44.9 | 44.9 | 98 | 0.92 | | 44.33 | 41.4 | 95 | 0.97 |

**Table – 9; (Statistical Table):**

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

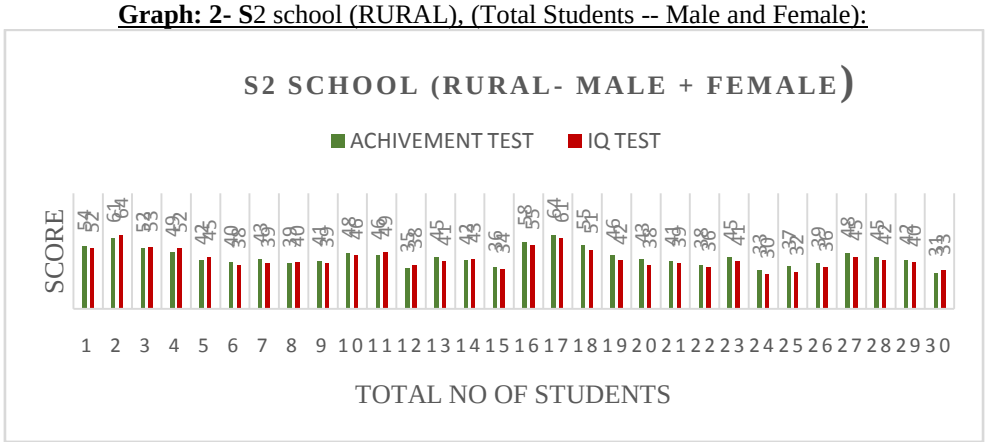
| S1 + S2 School (Total Male) | | | | | S1 +S2 School (Total Female) | | | |
|---|---|---|---|---|---|---|---|---|
| Mean Ach | Mean I.Q. | Deviation I.Q. | ρ (Rank difference co-relation) | | Mean Ach | Mean I.Q. | Deviation I.Q. | ρ (Rank difference co-relation) |
| 45.8 | 46.7 | 140 | 0.91 | | 49.5 | 47.2 | 141 | 0.96 |

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




**Figure– 1**

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




**Figure– 2**

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

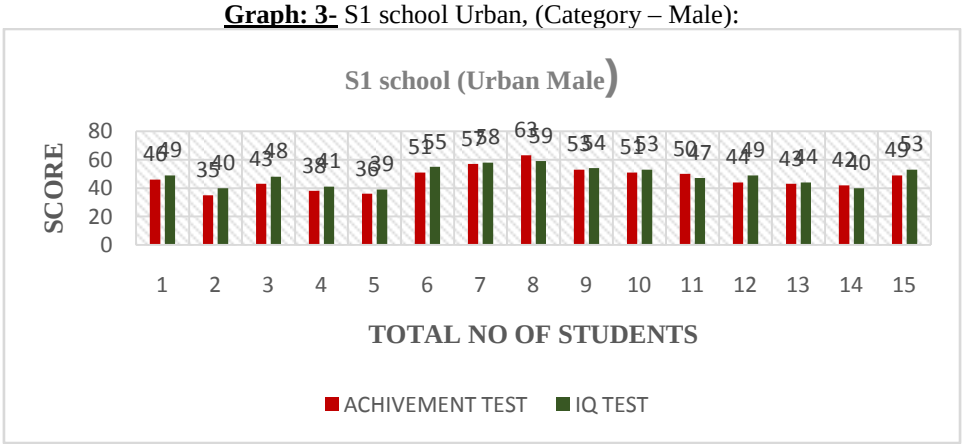
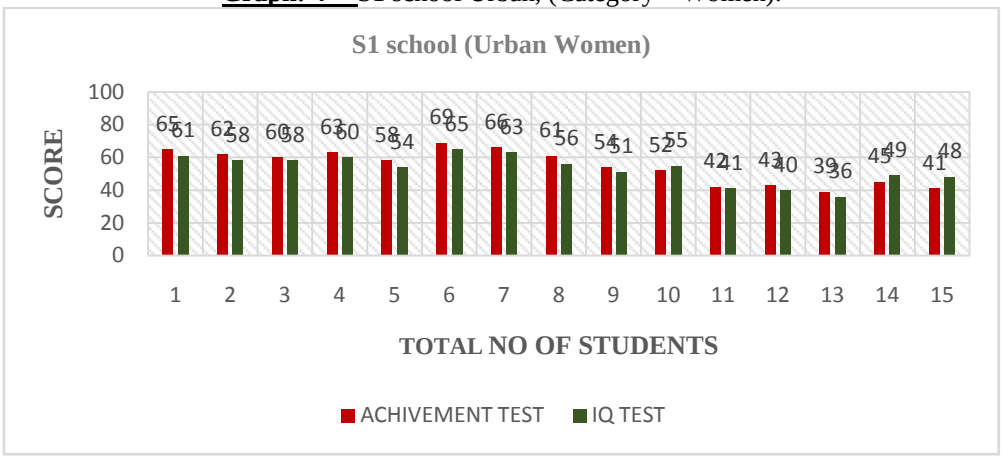


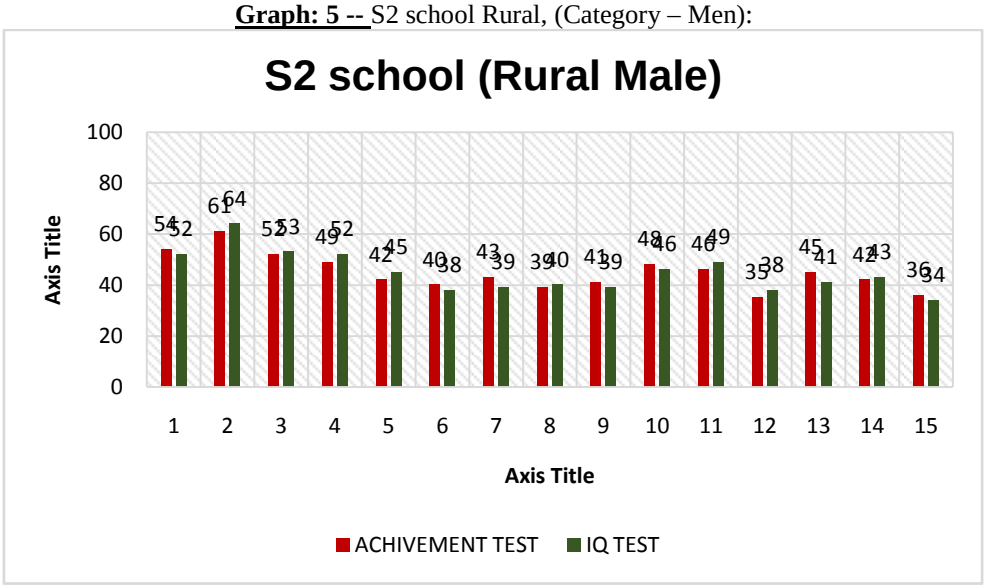

**Figure-3**

**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):

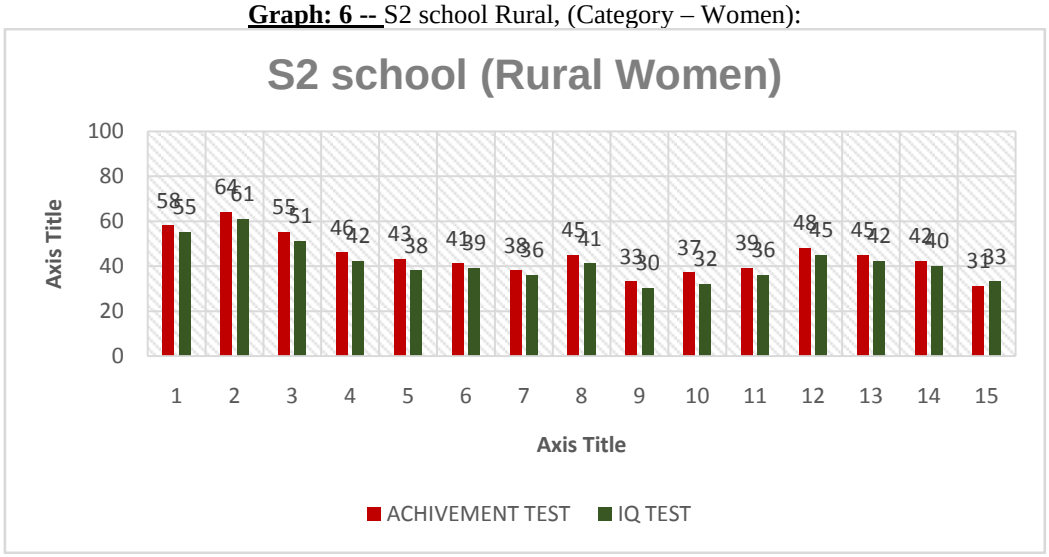



**Figure - 6**

**Graph: 7:** S1 & S2 school (Urban + Rural); (Category – TotalMen):

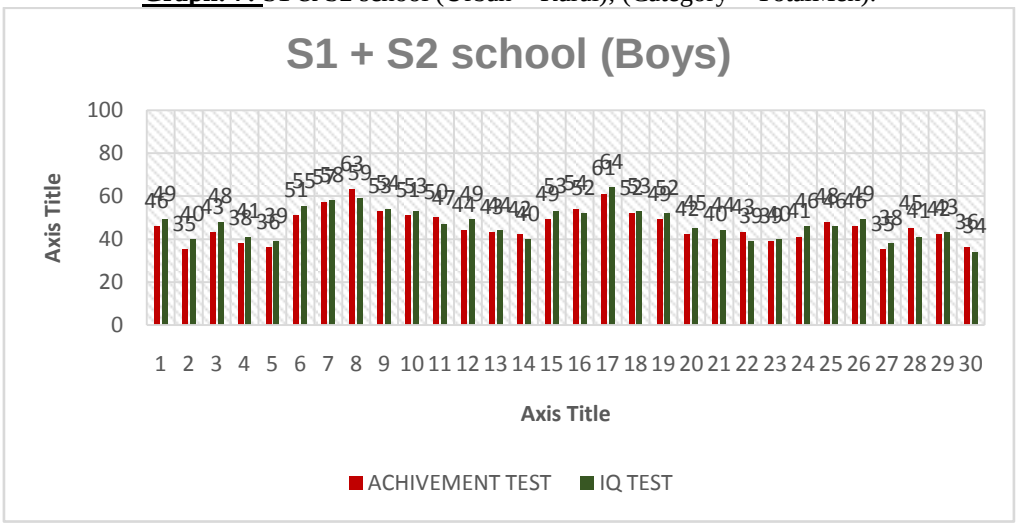



**Figure - 7**

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

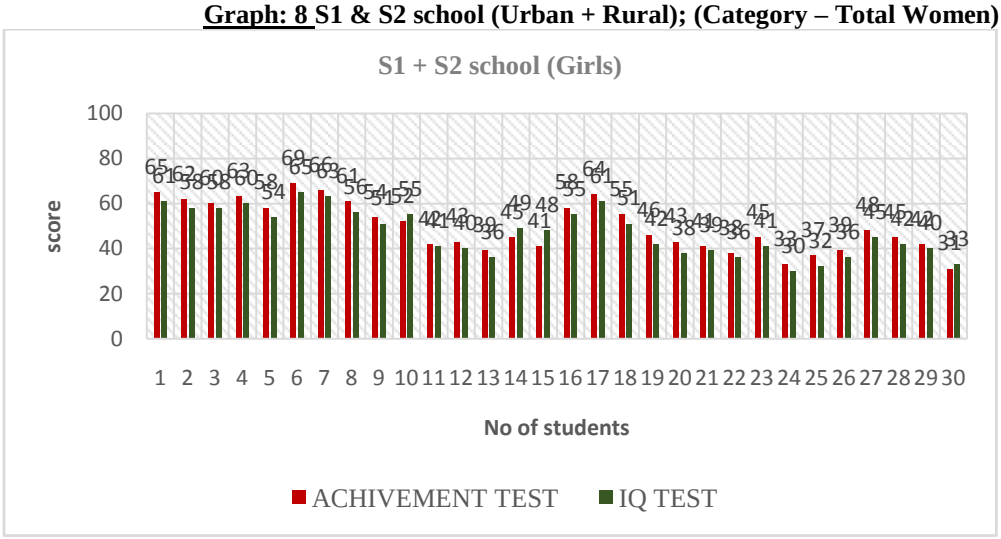



**Figure – 8**

## V. 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 greater than Mean Achievement in Physical Science in case of total students S2school (Rural) and Mean IQ and Deviation of IQ in case of S1school (total students) are also greater than S2school total students. It is also found that Rank difference co-relation for total students of both School are highly significant($\rho$=0.95 for male and $\rho$=0.93 for female).From the mean deviation IQ values of totalstudents of S1 school and S2 school areAverage (90-110) (obtained from the table of the Mixed Type Group Test of Intelligence).

From Statistical **Table - 7** it is found that Mean Achievement and mean IQ in Physical Science in case of S1school (Urban) Male is less than S1 school Female students of the same school. 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($\rho$=0.97 for male and $\rho$=0.968 for female). From the table of the Mixed Type Group Test of Intelligence the nature of both male and female students of S1school is Average (90-110).

From Statistical **Table - 8** it is found that Mean Achievement in Physical Science in case of S2 school (Rural) Male is slight greater than S2 school Female and alsoDeviation IQ of S2 school Male are also slight greater than mean IQ of Female students of the same school. Deviation 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($\rho$=0.92 for male and $\rho$=0.97 for female). From the table of the Mixed Type Group Test of Intelligence the nature of both male and female students of S2school is Average (90-110).

From **Table – 9** it is found that Mean Achievement in Physical Science in case of Total Male students of both schools (S1+S2) is less than Mean Achievement in Physical Science in case of Total Female students of both school (S1 +S2) but Mean IQ and Deviation IQ in case of Male Students of both schools are less than total Female students of both schools. It is also found that Rank co-relation for total students of both School are highly significant($\rho$=0.91 for total male and $\rho$=0.96 for total female). From the mean deviation IQ values of total students of S1 school and S2 school are Average(90-110) (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; ) the value of IQ and value of Achievement in Physical Science of all students are equal.

**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 last two cases the IQ values of Urban girls (S1 school) is less than the value of achievement in Physical Science.

**Fig. – 5** represents that value of IQ is slightly greater 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 of maximumboys'(22 students) students are slightly greater than values of Achievement in Physical Science (S1&S2 schools).

**Fig. – 8** shows that the value of Achievement in physical science for almost all students (26students) are slightly greater than that of IQ values (All girls students – S1&S2 schools).

## VI. Conclusion

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 average.

Therefore I.Q. is the predictor of Achievement in Physical Science of Learning-Disabled students in secondary level.

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.

## REFERENCE

[1]. Benjamin J. Sadock, Virginia A. Sadock, Pedro Ruiz, Kaplan & Sadock (2011), Study Guide and Self-Examination Review in Psychiatry.
[2]. Mangal. S.K. (2012), Statistics in Psychology and Education, 2nd Edition, PHI Learning Private Limited, New Delhi – 110001.
[3]. Mehrotra, P. N. (2008), Mixed Type Group Test of Intelligence (Verbal & Non-verbal), Moradabad.
[4]. Matson J.L., Fodstad J.C. (2010) Learning Disabilities. In: Thomas J.C., Hersen M. (eds) Handbook of Clinical Psychology Competencies. Springer, New York, NY
[5]. https://en.wikipedia.org/wiki/Learning_disability
[6]. vi)https://www.healthychildren.org/English/health-issues/conditions/learning-disabilities/Pages/Diagnosing-a-Learning-Disability.aspx

Koushik Halder. " Is Intelligence Quotient (I.Q,) The Predictor of Achievement in Physical Science of Learning-Disabled students In Secondary Level?." IOSR Journal of Humanities and Social Science (IOSR-JHSS). vol. 24 no. 11, 2019, pp. 63-70.