

GENERAL INTELLIGENCE AND ACADEMIC ACHIEVEMENT OF HIGH SCHOOL STUDENTS

P.B. Beulahbel Bency and G. Paramasivan

Department of Education, Mother Teresa Women's University, Kodaikanal,

ABSTRACT

In ancient India, intelligence was considered to be God's gift and it was said that intelligence is not as a result of the good works of the earlier life. It is the capacity to acquire and apply knowledge. Teachers evaluated intelligence by conversation, physiological structure, speech, facial expression and feeling. Later it came to be considered that intelligence is a definite trait which helps in abstract thinking and reasoning. Intelligence include the abilities for abstract thinking, reasoning, understanding, communication, learning, planning, emotional intelligence and problem solving. It is a conscious adaptation to new situations. Artificial intelligence is the intelligence of machines or the simulation of intelligence in machines. Achievement refers to the scholastic achievement of the student at the end of an educational programme. Academic achievement is related to the acquisition of principles and generalizations and the capacity to perform efficiently certain manipulation of objects, symbols and ideas. Assessment of academic performance has been largely confirmed to the evaluation in terms of information, knowledge, and understanding. Examinations are largely confined to the measurement of the amount of information which the students have acquired. In this study the investigator intends to study the General Intelligence and Academic Achievement of High School Students. The objectives of the study were to construct and validate a tool on Intelligence Test, to find the level of intelligence and academic achievement, to find the significant difference in the general intelligence and academic achievement with regard to the background variables namely Gender, Type of Management, Father's Educational Qualification, Mother's Educational Qualification and Parents Occupational Status and to find the relationship between general intelligence and academic achievement of high school students. Survey Method is adopted for the present study. 300 sample was selected by random sampling technique. A self-constructed intelligence test was used for the study. Mean, Standard Deviation, t' test, Analysis of Variance and Correlation were the statistical techniques used. Data were analyzed by SPSS. Based on the findings educational implications were given.

Key Words: Intelligence, Artificial Intelligence, Multiple Intelligence, Achievement and Academic Achievement

1. INTRODUCTION

Intelligence and achievement are two different, but interrelated, constructs. They have been studied for over a century in an attempt to explain differences in educational and life outcomes. Achievement and intelligence are often intertwined, especially when academic testing is involved. While there is some overlap between achievement and intelligence, the two concepts are much more different than they are alike. The similarity between achievement and intelligence is that they often improve the other. In other words, one builds and is often dependent on the other. The major difference is that achievement can be measured more easily than intelligence. There is a clear understanding of

what achievement is. Intelligence, on the other hand, is more difficult to define explicitly, which makes it a concept that is difficult to evaluate. Achievement is the ability to accomplish something based on knowledge and an acquired skill.

Intelligence

Intelligence is more than a warehouse of knowledge. Rather, intelligence comprises the capability to use knowledge to make sense of the world round us. It is a very general mental capability that, among other things, involves the ability to reason, plan, solve problems, think abstractly, comprehend complex ideas, learn quickly and learn from experience. It is not merely book learning, a narrow academic skill, or test-taking smarts. Rather, it reflects a wider and deeper capability for comprehending our surroundings - "catching on," "making sense" of things, or "figuring out" what to do (Gottfredson (1997:13). Psychologists' definitions of intelligence often reflect intellectual goals, objectives and doubts rather than providing a clear definition of intelligence (Anastasi, 1986). Most theories of intelligence centre about the concept of the presence of a general factor known as "g" (Spearman, 1904). This "g" can be measured and is correlated to things such as level of education, occupation, and socioeconomic status (Gottfredson, 1998). According to Spearman, a general factor or "g", plus one and more specific factors can explain people's performances on intelligence tests. People who perform well on a cognitive test tend to perform well on other tests because of the dominant g factor. Spearman then concluded that intelligence is a general cognitive ability that could be measured and numerically expressed. Jensen (1980) summarized the literature and noted that g is correlated with several life outcomes including scholastic performance, reaction time, job performance, occupational status, earned income, and creativity.

2. NEED AND SIGNIFICANCE OF THE STUDY

Intelligence is the ability and capacity to learn and early out abstract view or thinking to respond appropriately to a new situation. It is closely related to intellect which includes the abilities such as observing, thinking, understanding, and remembering. Intelligence has a great, influence in the academic activities of an individual.

The performance of the students in class is usually judged by their achievement score in the examinations. It is often considered as their academic achievement which has been treated as the main basis for admission and promotion of a student to his and her next class. It has also been taken as criteria even in selection an individual in to various vocational and professional courses. So, by keeping this in mind, a study has been under taken to find out the relation of general intelligence on the academic achievement of high school students.

3. STATEMENT OF THE PROBLEM

The assessment of intelligence has been a focus of research along with the conceptualization of intelligence for over a century. Intelligence can be measured with intelligence tests, which are among the most reliable and valid of psychological tests and assessments. Achievement is a wide and multidimensional construct. It encompasses student ability and performance; it is multidimensional; it is intricately related to human growth and cognitive, emotional, social, and physical development; it reflects the whole child; it is not related to a single occurrence, but occurs across time and levels, through a student's life in school and on into postsecondary years and working life. Hence the investigator aims to know the General intelligence and Academic Achievement of high school students.

4. OBJECTIVES OF THE STUDY

- To construct and validate a tool on Intelligence Test
- To find the level of General Intelligence of high school students
- To find the level of Academic Achievement of high school students
- To find the significant difference in the General Intelligence of high school students with respect to the background variables namely Gender, Type of Management, Father's Educational Qualification, Mothers' Educational Qualification and Parents Occupational Status.
- To find the significant difference in the academic achievement of high school students with respect to the background variables namely Gender, Type of Management, Father's Educational Qualification, Mothers' Educational Qualification and Parents Occupational Status.
- To find the relationship between General Intelligence and Academic Achievement of high school students.

5. METHODOLOGY

Method

Normative Survey Method was adopted for the present study

Sample

The sample consisted of 300 high school students of Kanyakumari District, Tamil Nadu, India selected by Random Sampling Technique.

Tool

The tool used for the present study is a self-made questionnaire to test the general intelligence of high school students. Half Yearly Examination Mark was considered for academic achievement.

Statistical Techniques Used

Percentage Analysis, Mean, Standard Deviation, t-test, Analysis of Variance and Correlation were the statistical techniques used for the study.

6. DATA ANALYSIS

Table – 1: Level of General Intelligence of High School Students

N	Low		Average		High	
	N	%	N	%	N	%
300	51	17.0	195	65.0	54	18.0

Table- 2: Level of Academic Achievement of High School Students

N	Low		Average		High	
	N	%	N	%	N	%
300	36	12.0	216	72.0	48	16.0

Table -3: Differences among Type of Management of High School Students in their General Intelligence

Variable	Source of variation	Sum of square	Degrees of freedom	Mean of freedom	Calculated F value	Table value	Remark Value
Type of Management	Between	34.46	2.00	17.23	1.09	3.03	NS
	Within	4700.27	297.00	15.83			

(NS = Not significant at 5% level: Null hypothesis is accepted)

Table -4: Differences among Father's Educational Qualification of High School Students in their General Intelligence

Variable	Source of variation	Sum of Square	Degree of freedom	Mean Square Variable	Calculated F value	Table Value	Remark at 5% Level
Father education qualification	Between	152.41	4.00	38.10	2.45	2.41	S
	Within	4582.32	295.00	15.53			

(S = Significant at 5 % level: Null hypothesis is rejected)

Table- 5: Post-Hoc Analysis for General Intelligence of High School Students with regard to Father's Educational Qualification

	Below SSLC	SSLC	Hr.Sec.	UG	PG
Below SSLC	-	0.17	1.33	0.11	*1.83
SSLC	-	-	1.16	0.27	1.66
Hr.Sec	-	-	-	1.43	0.50
UG	-	-	-	-	1.94
PG	-	-	-	-	-

Table-6: Differences among Mother's Educational Qualification of High School Students in their General Intelligence

Variable	Source of variation	Sum of Square	Degree of freedom	Mean Square Variable	Calculated F value	Table Value	Remark at 5% Level
Mother's Educational Qualification	Between	106.52	4.00	26.63	1.70	2.41	NS
	Within	4628.21	295.00	15.69			

(NS = Not significant at 5% level: Null hypothesis is accepted)

Table -7: Differences between Parents Occupational Status of High School Students in their General Intelligence

Parents Occupational Status	Mean	SD	N	Calculated t value	Remark
Employed	9.69	4.38	71	1.90	NS
Un employed	10.79	3.80	229		

(NS = Not significant at 5% level: Null hypothesis is accepted)

Table -8: Differences among Type of Management of High School Students in their Academic Achievement

Variable	Source of variation	Sum of square	Degrees of freedom	Mean of freedom	Calculated F value	Table value	Remark Value
Type of Management	Between	10970520.00	2.00	5485260.00	373.62	3.03	S
	Within	4360348.00	297.00	14681.31			

(S = Significant at 5 % level: Null hypothesis is rejected)

Table – 9: Post-Hoc Analysis for Academic Achievement of High School Students with Type of Management

	Government	Private	Aided
Government	-	* 417.57	24.98
Private	-	-	392.59
Aided	-	-	-

Table -10: Differences among Father's Educational Qualification of High School Students in their Academic Achievement

Variable	Source of variation	Sum of Square	Degree of freedom	Mean Square variable	Calculated F value	Table Value	Remark At 5% Level
Father's educational qualification	Between	3068628.00	4.00	7671570	18.46	2.41	S
	Within	12262270.00	295.00	41567.01			

(S = Significant at 5 % level: Null hypothesis is rejected)

Table -11: Post-Hoc Analysis for Academic Achievement of High School Students with regard to Father's Educational Qualification

	Below SSLC	SSLC	Hr. Sec.	UG	PG
Below SSLC	-	25.03	59.76	37.85	* 298.99
SSLC	-	-	84.79*	62.87	324.02*
Hr. Sec	-	-	-	21.91	239.23*
UG	-	-	-	-	261.14*
PG	-	-	-	-	-

Table -12: Difference among Mother's Educational Qualification of High School Students in their Academic Achievement

Variable	Source of variation	Sum of Square	Degree of freedom	Mean Square Variable	Calculated F value	Table Value	Remark At 5% Level
Mother's Educational Qualification	Between	3505532.00	4.00	876383.00	21.86	2.41	S
	Within	11825360.00	295.00	40085.98			

(S = Significant at 5 % level: Null hypothesis is rejected)

Table - 13: Post-Hoc Analysis for Academic Achievement of High School Students with regard to Mother's Educational Qualification

	Below SSLC	SSLC	Hr.Sec.	UG	PG
Below SSLC	-	144.24	130.49	* 334.84	196.42
SSLC	-	-	13.75	190.60	52.18
Hr.Sec	-	-	-	204.35	65.93
UG	-	-	-	-	138.42
PG	-	-	-	-	-

Table -14: Difference between Parents Occupational Status of High School Students in their Academic Achievement

Parents Occupational Status	Mean	SD	N	Calculated “t” value	Table value	Remark
Employed	467.20	258.41	71.00	4.47	1.96	S
Un employed	318.14	202.36	229.00			

(S = Significant at 0.05 level: Null hypothesis is rejected)

CORELATIONAL ANALYSIS

Table -15 Relation between General Intelligence and Academic Achievement of High School Students

Category	ΣX	ΣY	ΣX^2	ΣY^2	ΣXY	N	Calculated r value	Table Value	Remark
Total	15795	530306	190265	217672928	5536660	1500	1.085	1.971	NS

7. FINDINGS OF THE STUDY

- The level of general intelligence of high school students is average.
- The level of academic achievement of high school students is average.
- There is significant difference between male and female high school students with regard to general intelligence.
- There is significant difference among Government, Private and Aided high school students with regard to general intelligence.
- There is significant difference among high school students of father educational qualification below S.S.L.C, S.S.L.C, Hr. Sec., U.G and P.G with regard to general intelligence.
- There is no significant difference among high school students of mother educational qualification below S.S.L.C, S.S.L.C, Hr. Sec., U.G and P.G with regard to general intelligence.
- There is no significant difference between high school students of employed and unemployed parents with regard to general intelligence.
- There is significant difference between male and female high school students with regard to academic achievement.
- There is significant difference among Government, Private and Aided high school students in their academic achievement.
- There is significant difference among high school students of father’s educational qualification below S.S.L.C, S.S.L.C, Hr.Sec., UG and PG in their academic achievements.
- There is significant difference among high school students of mother’s educational qualification below S.S.L.C, S.S.L.C, Hr.Sec., U.G and P.G in their academic achievements.
- There is significant difference between high school students of employed and unemployed parents with regard to academic achievement.

- There is no significant relationship between general intelligence and academic achievement of high school students.

8. RECOMMENDATIONS

All are intelligent. It's just that our intelligence aspects different from person to person. As far as teaching and learning are concerned, general intelligence and capacity to learn are very significant which are conditioned by intelligence. So, teachers shall teach lessons for students according to their capacities and skills. Intelligence is the native ability, natural brightness, inborn capacity that determines the acquisition of learning. Thus, parents shall be given freedom to children to choose their future studies. To Binet the features of general intelligence are its tendency to take and maintain a definite direction, the capacity of adaptation for the accomplishment of a desired end, and the power of auto-criticism. Students shall study well to achieve their career. Another thing to consider, as you'll see when you continue into the lesson, is that there are different kinds of intelligence. Parents shall provide conducive learning atmosphere to children to develop their intellect. Classroom teachers shall be trained strategies for building achievement, but not how to use intelligence measures to efficiently design instruction in a way that leads to improved achievement. The higher the level of intelligence, the easier it is to comprehend abstract content and understand the complexities of a mentally challenging career. However, a determined level of intelligence does not command that an individual cannot learn specific content or follow a particular career. What it does tell us is how tough one might have to work to learn specific content or which professions will take more energy and effort if one is to pursue them with a high level of competency. It is advisable for teachers to give activities to students by considering their individual differences too.

9. CONCLUSION

The present study focused on the relationship between general intelligence and academic achievement of high school students. Understanding intelligence and its bond to achievement is also crucial for educators charged with finding and providing services to gifted students. Though it is common to use together an intelligence test and an achievement test in the identification procedure. Today, investigation into intelligence from the point of view of psychology has returned to its real roots. Like Binet, whose first aim was to help find children requiring special education, intelligence theory and research are being applied in a number of frameworks today, whether in terms of cognitive decline, promoting health, academic achievement or how to successfully encourage oneself intra- or interpersonally. One key advancement in this resurgence in the study of intelligence is the thinking about the role of intelligence within a number of models in artistic ways.

References

- Anastasi, A. (1986). Intelligence as a Quality of Behavior. In R. J. Sternberg & D. K. Detterman (Eds.), *What is Intelligence? Contemporary viewpoints on its Nature and Definitions* (pp. 19-21). Norwood, NJ: Ablex.
- Gottfredson, L. S. (1997). Mainstream Science on Intelligence: An Editorial with 52 Signatories, History, and Bibliography. *Intelligence*, 24(1), 13-23. doi:10.1016/S0160-2896(97)90011-8
- Gottfredson, L. S. (1998, Winter). The General Intelligence Factor. *Scientific American Presents*, 9(4), 24-29.
- Jensen, A. R. (1980). *Bias in mental testing*. New York, NY: Free Press.
- Spearman, C. (1904). "General Intelligence," objectively determined and measured. *American Journal of Psychology* 15, 201-293. doi:10.2307/1412107