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An Investigation of the Inter-Relationship of Intelligence Quotient and Its Comparison among Professional Students from Different Streams

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Abstract

Background: The purpose of the study was to investigate the inter-relationship of Intelligence Quotient and its comparison among professional students from different streams.

Methods: The study was confined to Banaras Hindu University. Subjects were selected on the basis of random sampling method. A total of 200 male professional students from different streams i.e. Engineering, Medical, Physical Education and Social Science (50 from each stream) were selected for the study. Observations were made on the contents related to General Intelligence. In order to determine the inter relationship of General intelligence Product Moment method of Correlation was applied. Finally, One Way Analysis of Variance (ANOVA) was used in order to compare intelligence quotient among professional students from different streams.

Results: Pearson's Product Moment Correlation for Intelligence Quotient between Physical Education and Social Science Students, showed existence of significant relationship for Intelligence Quotient. Further, Significant difference was found among Engineering, Medical, Physical Education and Social Science Students in relation to Intelligence Quotient.

Key words: Intelligence Quotient and Professional Students.

INTRODUCTION

To many people, the word "Intelligence" refers to an individual ability to perform cognitive tasks, whereas same psychologists argue that intelligence refers to an amalgamation of a number of relatively separate abilities. The concept of intelligence has been clearly tied to intelligence tests. Thus intelligence tests measure achievement as well as ability. This means that the two people can earn the same score of different reason, one because of high ability and low achievement and other the vice-versa.

There are probably as many definitions of *intelligence* as there are experts who study it. Simply put, however, intelligence is the ability to learn about, learn from, understand, and interact with one's environment. This general ability consists of a number of specific abilities, which include these specific abilities:

- Adaptability to a new environment or to changes in the current environment
- Capacity for knowledge and the ability to acquire it
- Capacity for reason and abstract thought
- Ability to comprehend relationships
- Ability to evaluate and judge
- Capacity for original and productive thought

Additional specific abilities might be added to the list, but they would all be abilities allowing a person to learn about, learn from, understand, and interact with the environment. Environment in this definition doesn't mean the environment of the earth, such as the desert, the mountains, etc., although it can mean that kind of environment. It has a wider meaning that includes a person's immediate surroundings, including the people around him or her. Environment in this case can also be something as small as a family, the workplace, or a classroom in a statement signed by 52 psychologists, published in the December 13, 1994 Wall Street Journal), contend the following:

1. Intelligence exists as a very general mental capability involving ability to reason, plan, solve problems, think abstractly, comprehend complex ideas, learn quickly and learn from experience. The brain processes involved are little understood.
2. Intelligence can be measured, and IQ tests measure it well. Non-verbal tests can be used where language skills are weak.
3. IQ tests are not culturally biased.
4. IQ is more strongly related than any other measurable human trait to educational, occupational, economic, and social outcomes. Whatever it is that IQ tests measure, it is very important.
5. Genetics plays a bigger role than environment in intelligence, but environment has a strong effect.
6. Individuals are not born with an unchangeable IQ, but it gradually stabilizes during childhood and changes little thereafter.

In the popular sense, intelligence is often defined as the general mental ability to learn and apply knowledge to manipulate your environment, as well as the ability to reason and have abstract thought. Other definitions of intelligence include adaptability to a new environment or to changes in the current environment, the ability to evaluate and judge, the ability to comprehend complex ideas, the capacity for original and productive thought, the ability to learn quickly and learn from experience and even the ability to comprehend relationships.

A superior ability to interact with the environment and overcome its challenges is often seen as a sign of intelligence. In this case, the environment does not just refer to the physical landscape (e.g. Mountains, forests) or the surroundings (e.g. school, home, workplace) but also to a person's social contacts, such as colleagues, friends and family – or even complete strangers (Wall Street Journal, 1994).

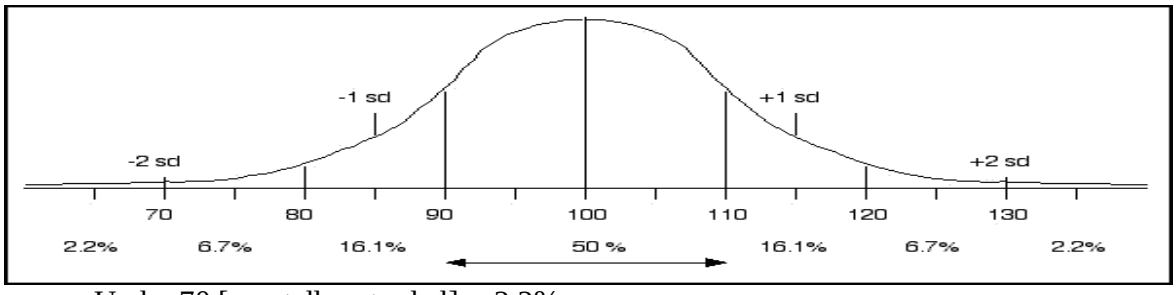
Researchers asked about the aspects of intelligence felt that factors like problem-solving ability, mental speed, general knowledge, creativity, abstract thinking and memory all played important roles in the measure and standard of intelligence. Most agree that intelligence is an umbrella term which covers a variety of related mental abilities.

Intelligence is a person's capacity to:

1. Acquire knowledge (i.e. learn and understand),
2. Apply knowledge (solve problems), and
3. Engage in abstract reasoning.

It is the power of one's intellect, and as such is clearly a very important aspect of one's overall well-being. Psychologists have attempted to measure it for well over a century.

Intelligence Quotient *(IQ)* is the score you get on an intelligence test. Originally, it was a quotient (a ratio): IQ= MA/CA x 100 [MA is mental age, CA is chronological age]. Today, scores are calibrated against norms of actual population scores.



- Under 70 [mentally retarded] -- 2.2%
- 70-80 [borderline retarded] -- 6.7%
- 80-90 [low average] -- 16.1%
- 90-110 [average] -- 50%
- 110-120 [high average] -- 16.1%
- 120-130 [superior] -- 6.7%
- Over 130 [very superior] -- 2.2%

Statement of the Problem

The statement of the problem was stated as to investigate the inter-relationship of Intelligence Quotient, and its comparison among professional students from different streams i.e. Engineering, Medical, Physical Education and Social Science.

Aims & Objectives of the Study

- To assess the Intelligence Quotient among professional students from different streams.
- To investigate the inter-relationship of Intelligence Quotient among professional students from different streams.
- To compare the Intelligence Quotient among professional students from different streams.

PROCEDURE AND METHODOLOGY

Coverage:

Universe of the Study:

The study was confined to Banaras Hindu University.

Sampling Frame:

Subjects were selected as a sampling frame from different professional streams i.e. Engineering, Medical, Physical Education and Social Science.

Sampling Method:

Subjects were selected on the basis of random sampling method.

Sampling Size:

A total of 200 male professional students from different streams i.e. Engineering, Medical, Physical Education and Social Science (50 from each stream) were selected for the study.

Units of Observation:

Observations were made on the following contents related to General Intelligence:

a) Word Meaning
b) Analogy
c) Classification
d) Number Series
e) Coding Decoding
f) Syllogism

Criterion Measures

The criterion measure adopted for the study was as follows:

- Assessment of Intelligence was done by using a Test of General Intelligence for College Students developed by S. K. Pal and K. S. Misra.

Statistical Techniques

- To characterize professional students on General intelligence the data was analyzed by applying Descriptive Statistics i.e. Mean, Standard Deviation, Range, Skewness, Kurtosis.
- Further, in order to determine the inter relationship of General intelligence Product Moment method of Correlation was applied.
- Finally, One Way Analysis of Variance (ANOVA) was used in order to compare intelligence quotient among professional students from different streams i.e. Engineering, Medical, Physical Education and Social Science.

RESULTS AND DISCUSSIONS OF THE FINDINGS

TABLE-I: Descriptive Statistics of Engineering, Medical, Physical Education and Social Science Students in relation to Intelligence Quotient

	Engineering Students	Medical Students	Physical Education Students	Social Science Students
Number	50	50	50	50
Mean	30.760	34.920	26.400	31.360
Std. Error of Mean	1.03591	1.16403	.97980	1.10648
Std. Deviation	7.32499	8.23095	6.92820	7.82398
Skewness	-1.14	-1.48	.882	-.956
Std. Error of Skewness	.337	.337	.337	.337
Kurtosis	4.107	3.593	.115	.973
Std. Error of Kurtosis	.662	.662	.662	.662
Range	39.00	39.00	26.00	32.00
Minimum	6.00	7.00	17.00	10.00
Maximum	45.00	46.00	43.00	42.00

Table-1 clearly depicts the descriptive statistics values for the Engineering, Medical, Physical Education and Social Science students in relation to Intelligence Quotient, which shows that the mean for Engineering, Medical, Physical Education and Social Science students were found to be 30.76 ± 1.03, 34.92 ± 1.16, 26.40 ± 0.97, and 31.36 ± 1.10 respectively. Standard deviations were 7.32, 8.23, 6.92, and 7.82 for the same. Range for Engineering, Medical, Physical Education and Social Science students were 39, 39, 26, and 32 respectively.

TABLE-II: Correlation Matrix for the Data on Intelligence Quotient along with p-Values

		TGI Engineering Students	**TGI Medical Students**	**TGI Physical Education Students**	**TGI Social Science Students**
TGI Engineering Students	Pearson Correlation	1	-.278	.232	.021
	Sig. (2-tailed)		.051	.105	.882
	N	50	50	50	50
TGI Medical Students	Pearson Correlation	-.278	1	-.188	-.244
	Sig. (2-tailed)	.051		.190	.087
	N	50	50	50	50
TGI Physical Education Students	Pearson Correlation	.232	-.188	1	.366**
	Sig. (2-tailed)	.105	.190		.009
	N	50	50	50	50
TGI Social Science Students	Pearson Correlation	.021	-.244	.366**	1
	Sig. (2-tailed)	.882	.087	.009	
	N	50	50	50	50

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Table-2 indicates the value of Pearson's Product Moment Correlation for Intelligence Quotient between Physical Education and Social Science Students, which showed existence of significant relationship for Intelligence Quotient as the calculated r- value 0.366 was greater than the required value at 0.05 levels of significance as well as at 0.01 level of significance. All those correlation coefficients having p-value less than 0.05 are significant at 5% level. This is shown by asterisk (*) mark by the side of the correlation coefficients. Similarly, correlation having p-value less than 0.01 are significant at 1% level and this is indicated by two-asterisk (**) mark by the side of the correlation coefficients.

TABLE- III: Analysis of Variance among Engineering, Medical, Physical Education and Social Science Students in relation to Intelligence

Source of Variation	**Sum of Squares**	**Df**	**Mean Square**	**F-Value**
Between Groups	1831.76	3	610.5867	10.59041
Within Groups	11300.32	196	57.65469	

*Significant at 0.05 level of significance, F 0.05 (3, 196) = 3.14

Table-3 revealed that there was significant difference among Engineering, Medical, Physical Education and Social Science Students in relation to Intelligence Quotient, as obtained

F-ratio was 10.59, which was higher than the tabulated value of 3.14, required for F-ratio to be significant at 0.05 level with (3,196) degree of freedom.

Since the one way analysis of variance was found significant in relation to Intelligence Quotient, the least significant difference (LSD) test was applied to find out the differences of the paired means among Engineering, Medical, Physical Education and Social Science Students.

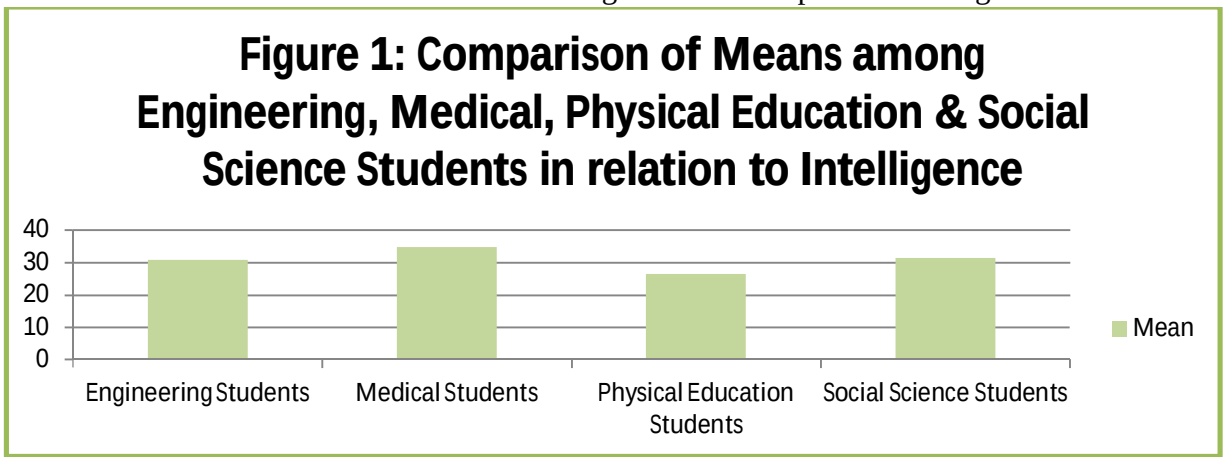
TABLE-IV: Least Significant Difference (LSD) post hoc test for the paired means among Engineering, Medical, Physical Education and Social Science Students in relation to Intelligence

Means				**Mean Difference**	**Critical Difference**
Engineering Students	**Medical Students**	**Physical Education Students**	**Social Science Students**		
1538	1746			208*	2.477758
1538		1320		218*	
1538			1568	30*	
	1746	1320		426*	
	1746		1568	178*	
		1320	1568	248*	

* Significant at 0.05 level of significance

It is evident from table- 4 that paired mean differences among Engineering, Medical, Physical Education and Social Science Students in relation to Intelligence was found significant between Engineering and Medical; Engineering and Physical Education; Engineering and Social Science; Medical and Physical Education; Medical and Social Science; Physical Education and Social Science. Hence, it is inferred that mean difference between Medical and Physical Education > Physical Education and Social Science > Engineering and Physical Education > Engineering and Medical > Medical and Social Science > Engineering and Social Science.

The graphical representation of means among Engineering, Medical, Physical Education and Social Science Students in relation to Intelligence has been presented in figure No.1.



DISCUSSION

The scholar examined the interrelationship of Intelligence Quotient and also compared the Intelligence among professional students from different streams i.e. Engineering, Medical, Physical Education and Social Science.

Correlation technique was applied between inter group (i.e. Engineering, Medical, Physical Education and Social Sciences) for IQ. In case of Intelligence Quotient significant relationship was found between Physical Education and Social Science Students.

Further, one way analysis of variance (ANOVA) was computed to find out the significant difference among the means. In case of significant result, post-hoc test (LSD test) was applied in order to determine the significant difference between the paired means.

Findings revealed that there was significant difference among Engineering, Medical, Physical Education and Social Science Students in relation to Intelligence Quotient. The possible reason could be the academic background and experiences of the individuals which reflects the intelligence of the individuals.

paired mean differences among Engineering, Medical, Physical Education and Social Science Students in relation to Intelligence was found significant between Engineering and Medical; Engineering and Physical Education; Engineering and Social Science; Medical and Physical Education; Medical and Social Science; Physical Education and Social Science. Hence, it is inferred that mean difference between Medical and Physical Education > Physical Education and Social Science > Engineering and Physical Education > Engineering and Medical > Medical and Social Science > Engineering and Social Science. Analysis of finding clearly shows that Medical students scored high in IQ in comparison to Physical Education students. Terman said that an individual is intelligent in proportion to his ability to carry on abstract thinking.

The findings are in consonance with the study of Fannin, Barbara, Ellen. (2001), Max B. Wu (2008), and Tomporowski, Davis, Miller, Naglieri, (2007).

CONCLUSIONS

1. Pearson's Product Moment Correlation for Intelligence Quotient between Physical Education and Social Science Students, showed existence of significant relationship for Intelligence Quotient.
2. Significant difference was found among Engineering, Medical, Physical Education and Social Science Students in relation to Intelligence Quotient.
3. Paired mean differences among Engineering, Medical, Physical Education and Social Science Students in relation to Intelligence was found significant between Engineering and Medical; Engineering and Physical Education; Engineering and Social Science; Medical and Physical Education; Medical and Social Science; Physical Education and Social Science. Hence, it is inferred that mean difference between Medical and Physical Education > Physical Education and Social Science > Engineering and Physical Education > Engineering and Medical > Medical and Social Science > Engineering and Social Science.

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