

# LOGICAL-MATHEMATICAL INTELLIGENCE AND ACHIEVEMENT OF COMPUTER SCIENCE DEGREE STUDENTS

Research  
Paper

## ABSTRACT

*This paper reports on the Logical-mathematical Intelligence and academic achievement of computer science students. The sample consisted of 59 B.Sc. computer science students. A scale on Logical-mathematical intelligence was used to get the data from the students. Percentage analysis, Pearson-Product moment correlation co-efficient, t-test, F-test and chi-square tests were used for analyzing the data. The result shows that there is a low negative correlation between the Logical-mathematical Intelligence and achievement in computer science of degree students.*

## INTRODUCTION

For over two thousand years civilizations have been discussing the existence and importance of mental powers -capacities reflecting intelligence or the deployment of the mind-which led to a rise in the desire to learn more about the human brain and human potential. In the early 70's, Dr.Howard Gardner believed that there was a persuasive evidence for the existence of several relatively autonomous human intellectual competencies which he referred to as "human intelligences". Logical - Mathematical Intelligence is the second of the multiple intelligences, typically emphasized in schools and colleges. This intelligence includes not only the ability to use numbers but reasoning ability and scientific thinking ability. The current efforts to develop critical thinking skills also dovetail with this intelligence. Any activity which relies on the development of a logical sequence of steps is utilizing this intelligence. Careers which draw on this intelligence include mathematician, accountant, scientific researcher, and computer programmer. Some of the researchers in the field of education and psychology tried to find out the influence of different intelligence on education. Woods and Gary Cornelivs (2004) conducted a study on students' perceptive of web based technologies, principles of good practice and multiple intelligence. The findings of the study revealed that there is significant correlation between student satisfaction with web based instruction and student

rating of web hand technologies and principles of good practice, and multiple intelligence discussion board, course information, e-mail, web links and announcement features received higher rating than syllabus, journal file exchange, multimedia and homepage features. Mackic and Russell Keith (2005) conducted the study among North Carolina community college students. This study revealed that there was no significant relationship between logical mathematical intelligence and linguistic intelligence and also there was no significant relation between spatial intelligence and logical mathematical intelligence. Though there many studies have been done in multiple-intelligences, this study is unique in its attempt to find out the influence of logical mathematical intelligence on achievement in Computer Science of degree students, which is considered as one of the important abilities in program development.

## OBJECTIVES OF THE STUDY

1. To find out the level of logical-mathematical intelligence among Computer Science degree students.
2. To find out the level of academic achievement in Computer Science of degree students.

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3. To find out the relationship between logical-mathematical intelligence and academic achievement of Computer Science degree students.

The above said objectives are achieved in terms of demographic variables: gender, type of the college, nature of the college, educational qualification of the parents and occupation of the parents.

### NULL HYPOTHESES

1. There is no significant difference in logical-mathematical intelligence of Computer Science degree students with respect to

- i. Gender
- ii. Type of the college
- iii. Nature of the college

2. There is no significant association in logical-mathematical intelligence of Computer Science degree students with respect to

- i. Educational Qualification of parents
- ii. Occupation of parents

3. There is no significant difference in the academic achievement of Computer Science degree students with respect to

- i. Gender
- ii. Type of the college
- iii. Nature of the college

4. There is no significant association in the academic achievement of Computer Science degree students with respect to

- i. Educational Qualification of parents
- ii. Occupation of parents

5. There is no significant influence of logical-mathematical intelligence on the academic achievement of Computer Science degree students.

**METHOD** Survey method of research was adopted for the study.

### SAMPLE

Randomly selected first year



Computer Science students from Rani Anna College of Arts and Science, Tirunelveli and St. John's College of Arts and Science, Palayamkottai were selected for the study.

### TOOL

Logical-mathematical intelligence scale developed by Kanmani(2008) and Annaraja(2008) was used for data collection.

### SOURCE OF ACHIEVEMENT IN COMPUTER SCIENCE

The second semester marks of I year Computer Science degree students were collected from the college record.

### DATA ANALYSIS

Percentage, t- test, F- test, Chi-square test and Karl Pearson product moment co-efficient of correlation were used for analyzing the data.

TABLE 1

LEVEL OF LOGICAL-MATHEMATICAL INTELLIGENCE AND ACHIEVEMENT OF THE STUDENTS IN COMPUTER SCIENCE

S. No	Level of Logical-mathematical intelligence	No. of Students	%	Academic Achievement	No. of Students	%
1	High	10	16.94	High	8	13.55
2	Moderate	28	47.45	Moderate	38	64.4
3	Low	21	35.59	Low	13	22
4	Total	59	100	Total	59	100

It is inferred from the above table that 16.94% of Computer Science students have high level logical-mathematical intelligence, 47.45% of them have moderate level of logical-mathematical intelligence and 35.59% of them have low level of logical-mathematical intelligence.

Further, it is inferred that 13.55% students have high level of academic achievement, 64.40% students have moderate and 22% of them have low level of academic achievement in computer science.

**TABLE 2**  
**DIFFERENCE IN LOGICAL-MATHEMATICAL INTELLIGENCE OF COMPUTER SCIENCE DEGREE STUDENTS**

Factor		N	Mean	S.D	t-Value	df	Remark
Gender	Male	17	13.65	3.1	1.582	57	NS
	Female	42	15.1	3.38			
Type of College	Co-education	32	15.34	3.507	1.713	57	NS
	Women	27	13.89	3.017			
Nature of College	Govt.	32	15.34	3.507	1.713	57	NS
	Govt. Aided	27	13.89	3.017			

(For 57df at 5% level of significance the 't' value is 2.02)

It is inferred from the above table that the calculated 't' values (1.582 and 1.713) are less than the table value of 't' (2.02). Hence the null hypotheses are *accepted*. Thus there is no significant difference between male and female, coeducation and women, govt. and govt aided Computer Science students in logical-mathematical intelligence.

**TABLE 3**  
**ASSOCIATION BETWEEN LOGICAL - MATHEMATICAL INTELLIGENCE OF DEGREE STUDENTS AND EDUCATIONAL QUALIFICATION AND OCCUPATION OF THEIR PARENTS**

Factors		Logical-mathematical intelligence				df	Calculated chi-square Value	Remark
		Low	Mode rate	High	Total			
Educational Qualification of Parents	Illiterate	3	8	10	21	4	6.149	NS
	School Education	6	14	11	31			
	College Education	1	6		7			
Total		10	28	21	59			
Occupation of parents	Coolie	9	14	15	38	4	6.787	NS
	Government Employee	1	10	3	14			
	Business		4	3	7			
Total		10	28	21	59			

(For 4df at 5% level of Significance the  $\chi^2$  value is 9.488)

It is inferred from the above table that the calculated  $\chi^2$  values (4.942 and 4.545) are less than the table value of  $\chi^2$  (9.488). Hence the null hypotheses are *accepted*. Thus there is no significant association between educational qualification and occupation of the parents of the students and their logical-mathematical intelligence of Computer Science students.

**TABLE 4**  
**DIFFERENCE IN ACHIEVEMENT IN COMPUTER SCIENCE OF COMPUTER SCIENCE STUDENTS**

Factor		N	Mean	S.D	t-Value	Remark
Gender	Male	17	5.88	2.09	0.59	Not Significant
	Female	42	5.52	2.14		
Type of College	Co-education	32	67.06	8.79	0.15	Not Significant
	Women	27	66.73	8.43		
Nature of College	Govt.	32	67.06	8.79	0.15	Not Significant
	Govt. Aided	27	66.73	8.43		

(For 57df at 5% level of significance the 't' value is 2.02)

It is inferred from the above table that the calculated 't' values (0.593, 0.147, and 0.147) are less than the table value of 't' (2.02). Hence the null hypotheses are *accepted*. Thus, there is no significant difference between male and female students, government aided college students, government college students, women's and co-education college students' achievement in computer science.

It is inferred from table 5 that the calculated  $\chi^2$  values (1.364 and 4.775) are less than the table value of  $\chi^2$  (9.488). Hence the null hypotheses are *accepted*. Thus there is no significant association between the educational qualification and Occupation of the parents of the students and their achievement in computer science of the students.

**TABLE 5**  
**ASSOCIATION BETWEEN ACHIEVEMENT IN**  
**COMPUTER SCIENCE AND EDUCATIONAL**  
**QUALIFICATION AND OCCUPATION OF THE**  
**PARENTS OF THE STUDENTS**

Factors		Academic Achievement				df	Calculated chi-square Value	Remarks
		Low	Moderate	High	Total			
Educational Qualification of Parents	Illiterate	4	13	4	21	4	1.364	NS
	School Education	8	20	3	31			
	College Education	1	5	1	7			
	Total	13	38	8	59			
Occupation of parents	Coolie	8	26	4	38	4	4.775	NS
	Government Employee	5	7	2	14			
	Business	0	5	2	7			
	Total	13	38	8	59			

(For 4df at 5% level of Significance the  $\chi^2$  value is 9.488)

**TABLE 6**  
**CORRELATION BETWEEN**  
**LOGICAL-MATHEMATICAL INTELLIGENCE**  
**AND ACHIEVEMENT IN COMPUTER**  
**SCIENCE OF THE STUDENTS**

			Remarks
Meta cognition and Academic Achievement	df = 57	r = -0.067	NS

(For 57df at 5% level of significance the 'r' value is 0.250)

It is inferred from the above table that the calculated 'r' value (-0.067) is less than the table value (0.0250). Hence the null hypothesis is **accepted**. Thus there is no significant influence of logical-mathematical intelligence on achievement of computer science degree students.

**FINDINGS**



**1. Logical-Mathematical Intelligence**

- 1.1. 16.94% of computer science students have high level of logical-mathematical intelligence.
- 1.2. Male and Female computer science degree students do not differ in their logical-mathematical intelligence.
- 1.3. There is no significant difference between the computer science degree students studying in co-education colleges and women's colleges in their logical-mathematical intelligence.
- 1.4. There is no significant difference between the government and government aided Computer Science degree students in their logical-mathematical intelligence.
- 1.5. There is no significant association between logical-mathematical intelligence and educational qualification of parents of Computer Science degree students.
- 1.6. There is no significant association between logical-mathematical intelligence and occupation of the parents of Computer Science degree students

**2. Achievement in Computer Science**

- 2.1 78.95% of students have high level of achievement in Computer Science.
- 2.2 Male and female computer science degree students do not differ in their achievement in Computer Science.
- 2.3 There is no significant difference between government and government aided college students' achievement in Computer Science.
- 2.4 There is no significant difference between the students from Women's and those from co-education colleges in their achievement in Computer Science.

2.5 There is no significant association between achievement in Computer Science and educational qualification of the parents of Computer Science degree students.

2.6 There is no significant association between achievement in Computer Science and the Occupation of the parents of computer science degree students.

### 3. Relationship between logical-Mathematical Intelligence and Achievement in Computer Science

3.1 There is a low negative correlation between logical-mathematical intelligence and achievement of Computer Science degree students.

### SUGGESTIONS

We suggest the following teaching strategies to foster logical/mathematical intelligence in Computer Science students

- i. Learning opportunities for problem solving using critical thinking skills can be structured for teaching the abstract concepts like pointers and arrays in computers.
- ii. Project using scientific methods can be conducted to foster problem solving abilities among the students for the development of efficient computer softwares.
- iii. Opportunities should be given to the learners to compare and contrast objects (physical things) and concepts (mental things) in the classrooms.
- iv. Students should be encouraged to participated in empirical study based on the scientific method
- v. Students should be encouraged to analyze a series of events or phenomena for underlying patterns in the new learning concepts.
- vi. Technological tools and software can be used in classroom teaching based on logical-mathematical intelligence which can lure students into topics they may have previously disliked.

vii. Interactive white boards enable teachers to present multi-sensory materials that will be more easily understood absorbed by a wider audience.

viii. Sensor based teaching method can be used.

ix. Using multimedia to include audio, video, text images as parts of a lesson presentation or means of learners presenting their work offer significant means of addressing the need of different of learning styles

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Education is a liberating force, and in our age it is also a democratizing force, cutting across the barriers of caste and class, smoothing out inequalities imposed by birth and other circumstances.

- Indira Gandhi

To find out what one is fitted to do and to secure an opportunity to do it, is the key to happiness.

- John Dewey