"A Study of Achievement in Mathematics In Relation To Intelligence"

Dilpreet Kaur

Assistant Professor

GNCE, Majatri.Mohali

ABSTRACT*: In this study, the total sample comprised of 100 students with 50 male and 50 female students from both government and private schools. It was found that there is a positive relationship between Mathematical achievement and Intelligence of adolescents and significant Mean difference was found between Mathematical achievement of males and females at both high and low levels of Intelligence but there is no significant Mean difference between Mathematical achievement of males and females at average level of Intelligence.*

INTRODUCTION

Mathematical education is in a state of ferment all over the world. Millions of dollars, pounds, yen and rupees have been spent on improving it for the simple reason that mathematical education is important not only for mathematical research, but it is also vital for education and research in physics, chemistry, biology, engineering, economics, management and industry, Infact in almost all branches of knowledge.

It is observed that most of the school going students take mathematics as horrible subject and its progress report mirrors mystery. It is mainly because of the abstract nature and technical language of mathematics which needs to properly taught and studied. Mathematical achievement is effected by so many factors e.g. personality, intelligence, logic power, judgment ability, problem solving ability etc.

In the present fast paced life more emphasis is laid on the mathematical achievement of the people as no society can afford to shut its doors of prosperity which in turn are directly linked with the *'information outbreak'* through computers. Mathematics is essentially cognitive in character. It inculcates in pupil a problem solving ability, a clear expression of thoughts, logical reasoning etc. Mathematical achievement refers not only to obtaining excellent marks in the grade level final examination but also refers to the attainment of mathematical ability and skills

Mathematics plays an important role in our life. Today mathematics is used as an essential tool in many fields including natural sciences, engineering, medicine, and social sciences but students at school level are generally afraid of mathematics. Mathematics is considered as dry, dull and boring subject because interest toward mathematics is not favorable. The low achievement of students is going on increasing. Intelligence also affects the achievement of students in mathematics. So there is dire to study the relationship between mathematical achievement and intelligence **Aswal, (2001)** examined the relationship of intelligence with achievement in mathematics in context with different level of socio-economic status. 200 students of class 11th served as sample for the study and found that there exists a significant correlation between intelligence and achievement in mathematics. Relations between intelligence and

achievement may vary across different levels of economic status. ***Chauhan, (1982)*** constructed and standardized an achievement test is mathematics for class 9ᵗʰ students in Delhi with reference to categories of Guilford's structure of intellect model. ***Chen-hui-ling, (2001)*** found different factor structures and different influences on mathematical achievement. It supported ineffectiveness of home environment attitude towards mathematics and educational aspiration emerged as the more important and consistent predictor of mathematical achievement. Peer influences, school environment and study habits had mixed.

Ujwala (1990): investigated pupil's academic achievement in relationship to their intelligence, neuroticism and locus of control and found that girls had a significantly higher academic achievement than boys. Academic achievement showed a positive and significant correlation with intelligence.and I.Q. He concluded that a students' perception of himself may be an important predictor of success in the academic areas. ***Gakhar, (1981)*** studied intelligence and mathematical concept formation and concluded that those students scoring in the intellectual range of I.Q's above 109 attained significantly higher mean scores than those students functioning in the low range of intelligence (88-99) in the attainment of mathematical concepts.

Shah, J.H., (1990) indicated in his study relationship among intelligence, self-concept and academic achievement of pupils and of positive and significant relationship between intelligence and achievement. ***Sharma, M. & Shukla, P., (1997)*** *concluded that students of various types of school differ significantly in their intelligence and educational and mathematical achievement* ***Oh – Hwang, Youngjoo, (1995)*** found that high level of academic achievement was shown by students with intellectual ability.

DELIMITATIONS

The following are the delimitations of the study:

1. Only two variables i.e. mathematical achievement and intelligence were studied.
2. The sample for the present study was drawn from the students of class X of Mohali.
3. The sample was delimited to 100 students.
4. The study was delimited to 50 males and 50 females as a whole.
5. The levels of intelligence were calculated at three levels i.e low, average and high levels of Intelligence.

OBJECTIVES OF THE STUDY

1. To study the relationship between mathematical achievement and intelligence of adolescents.
2. To find out difference between mathematical achievement of males and females at different levels of intelligence.

HYPOTHESES:

The following hypotheses were set-up for investigation:

1. There is no significant relationship between mathematical achievement and intelligence of adolescents.
2. There is no significant mean difference between mathematical achievement of males and females at different levels of intelligence.

SAMPLE

In the present study, sample comprised of 100 students and equal number of students were taken from both government and private schools, 50 students (25 males and 25 females) were taken from each category of schools i.e. government and private schools. This technique of sampling was random in nature. Equal number of males and females were taken for the purpose of data collection.

TOOL USED

The following tools were used to collect the data:

1. Group test of General Mental Ability by Jalota and Singh, Punjabi Version, 1982
2. Achievement test in mathematics by Shahapur, P.N. and Aslam Khan, M.K. (1971) English Version.

STATISTICAL TECHNIQUES USED

1. Descriptive statistics such as mean, standard deviation and t-test were worked out to measure the difference between mathematical achievement at high, average and low level of intelligence.
2. Pearson's product moment correlation technique to find out the relationship between intelligence and mathematical achievement.

Table1 Correlation between mathematical achievement and intelligence of adolescents

Variables	No. of students	Correlation
Mathematical Achievement	100	0.59**
Intelligence	100	

** indicates value significant at 0.01 level

The value of correlation between intelligence and mathematical achievement is 0.59. This value of 'r' is significant, meaning thereby that a significant relationship exists between intelligence and mathematical achievement. Thus hypothesis (1) which states that "There is no significant relationship between intelligence and mathematical achievement of adolescents" cannot be accepted. Hence the correct hypothesis is "There is significant relationship between intelligence and mathematical achievement of adolescents".

Table 2.1Mean Difference between mathematical achievement of males and females at high level of Intelligence

Groups	Means	SD's	No. of students	t-ratio
Males	43.08	10.16	13	3.75**
Females	28.57	9.96	14	

** indicates value significant at 0.01 level

Table 2.1 shows that the value of mean scores of mathematical achievement of males and females at high level of intelligence are 43.08 and 28.57 respectively and the value of SD's are 10.16 and 9.96 respectively and their t-ratio is 3.75 which is significant at 0.01 level which implies that there is a significant mean difference between mathematical achievement of males and females at high level of intelligence.

Table 2.2: Mean Difference between mathematical achievement of males and females at average level of Intelligence

Groups	Means	SD's	No. of students	t-ratio
Males	34.43	8.61	23	1.50
Females	30	10.99	22	

From Table 2.2 we find that the value of mean scores of mathematical achievement of males and females at average level of intelligence are 34.43 and 30 respectively and the value of SD's are 8.61 and 10.99 respectively and their t-ratio is 1.50 which is not significant which implies that there is no significant mean difference between mathematical achievement of males and females at average level of intelligence.

Table 2.3: Mean Difference between mathematical achievement of males and females at low level of Intelligence

Groups	Means	SD's	No. of students	t-ratio
Males	25.43	7.11	14	3.57**
Females	17.57	4.15	14	

** indicates value significant at 0.01 level

Table 2.3 shows that the value of mean of mathematical achievement of males and females at low level of intelligence are 25.43 and 17.57 respectively and the value of SD's are 7.11 and 4.15 respectively and their t-ratio is 3.57

which is significant at 0.01 level, implying thereby that there is a significant mean difference between mathematical achievement of males and females at low level of intelligence.

FINDINGS AND DISCUSSION

The intelligence scores of adolescents were divided into three groups-high, average and low. Adolescents in the upper 27% of the intelligence group were considered belonging to high intelligence and those in the lower 27% intelligence group were named the low intelligence group, whereas the remaining adolescents were placed in the average intelligence group.

Table 2.3 shows that the value of mean of mathematical achievement of males and females at low level of intelligence are 25.43 and 17.57 respectively and the value of SD's are 7.11 and 4.15 respectively and their t-ratio is 3.57 which is significant at 0.01 level, implying thereby that there is a significant mean difference between mathematical achievement of males and females at low level of intelligence.

EDUCATIONAL IMPLICATIONS

In accordance with the findings of study, the following recommendations are made:

- This study is helpful for guidance and counseling purposes.

- The parents and teachers should help to create conductive learning environment by interacting with the children and providing basic necessary learning materials for their children.

- The teachers and parents can motivate the children and guide them to channelize their efforts in order to improve their achievement in mathematics.

- It helps the teacher in adopting suitable teaching methods in order to improve mathematical achievement of the students.

- The school administrators, particularly the mathematics teachers should persuade and encourage their students to register in mathematics clubs in their school settings.

- Students should be exposed continually to challenging life situations about the benefits of mathematics in the contemporary technological and fast developing society.

- Individual counseling can serve as an effective intervention to improve their mathematical achievement.

- Helpful to know the individual differences of children.

REFERENCES

1. **Aswal, G.S., (2001)** Intelligence as a correlate of Achievement in Mathematics Across Different level of SES Indian Educational Abstracts, 2(1).
2. **Chauhan, Poonam, (2001)** "Helping the underachiever in science." School sciences,Vol. 3 No.3, Sept 2001.
3. **Chen-Hui-Ling, (2001)** Across national study of factors influencing mathematics achievement for eight grade students DIA-A62/03. p325.
4. **Devi Ujwala. A (1990)** Pupils Academic Achievement in relationship to their intelligence, neuroticism and locus of control. Fifth Survey of Research in Education.
5. **Gakhar, S.C.,** "Teaching of Mathematics" N.M. Publishers, Chandigarh.
6. **Jalota and Singh (1982)** Group test of General Mental Ability.
7. **Oh – Hwang, Youngjoo, (1995)** Cross Cultural Study: Linkages among intelligence, physio-social maturity, parenting practices and academic achievement of adolescents. Dissertation Abstracts International, 56(2)
8. **Shah, J.H., (1990)** A study of relationship among intelligence, self-concept and academic achievement of pupils of standard 10th of urban and rural areas of Sihore Taluka, Experiments in Education, 23(3)
9. **Shahapur, P.N. and Aslam Khan, M.K.(1971)** Achievement test in mathematics
10. **Sharma, M. &Shukla P., (1997)** "A Comparative and Correlation Study of Intelligence and Educational Achievement", The Educational Review, Vol. C-III, pp. 71,74.