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Topic: Achievement of Senior Secondary School Students in Mathematics: The Contribution of Intelligence and Socio Economic Status

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Abstract: The present study aims to study the significant predictors in mathematics achievements among adolescents. Descriptive survey method was used as a research design for the study. The target population of the study was the students studying in senior secondary schools of Hisar district in Haryana. A sample of 130 students was randomly selected out of 7 senior secondary C.B.S.E. schools out of which 69 were males and 59 females. The study revealed that Intelligence emerged as the most significant predictor in mathematics achievement among adolescents. This is in consistent to previous researches conducted by Das (1986), Patel (1997), Kasat (1991), Abdulmajeed (1992) and Fernandez (2011), who reported positive relationship between the intelligence and mathematics achievement.

Keywords: Mathematics Achievement, Intelligence, Socio-Economic Status, Gender, Adolescents.

NTRODUCTION: Education occupies a vital role in the lives of common people. It involves a process of character building, strengthening mind and expansion of intellect. It is the preparation for a complete life. It is a process by which a person gains understanding about himself as well as the environment. It ensures the all-round development of man where he trains himself to fulfill his aims. Through education a child developed his inherent capacities in consonance with his natural environment. "Education is the process by which people's abilities and talents are developed. Education in this broad sense, is also everything that is learned and acquired during lifetime: - habits, knowledge, skills, interests, attitudes and personality." Education is the activity which involves integration and gradual development of individual's abilities. It refers to the acquirement of knowledge and transmitting it to the next generation. It is a means by which an individual gains knowledge, insights and develop attitude or skills. It is a dynamic process that starts from birth. A child learns through his parents and other family members. He collects information from his surrounding environment which is physical and social. He also interacts with his environment. Through his responses one can understand that his development is normal, abnormal and extraordinary. Various children differ in terms of their response at the same biological age because of the development of their perceptive and cognitive skills such as seeing, hearing, smelling, touching and mental processing. The response of children also depends upon their family background/environment. So education is also affected by the environment. It is concerned with methods of teaching and learning in schools as well as the school environment.

Mathematics has become a substantial and integral part of an organized society. Mathematics is fundamental to national prosperity in providing tools for understanding science, engineering, technology and economics. Despite innumerable the usefulness of mathematics in every sphere of our life, there has been a general perception among students that mathematics is one of the most difficult subjects and therefore only intelligent students should opt mathematics at higher level of studies. Students' mathematics achievement is often associated with the future of a country (Baker & LeTendre,2005; Wobmann, 2003). Thus, the desire to understand and identify factors that may have meaningful and consistent relationships with mathematics achievement has been commonly shared among national leaders, policy makers and educators around the world. Various investigators have studied numerous variables which were found accountable for the success

or failure of mathematics. An increasing pool of research findings indicate there are various factors like demographic, individual, instructional, classroom management and evaluation factors that have an impact on mathematics achievement of the students. Intelligence, aptitude, attitude, anxiety, adjustment, creativity, socio-economic status and gender are among the few variables which are found to have a significant influence on mathematics achievement.

Intelligence is conceived as a general mental power or multiplicity of mental powers that could be measured on a vertical scale by a single score. It has been argued that more intelligent pupil tend to score higher in mathematics than their less intelligent counterparts. Fernandez (2011) found positive relationship between intelligence and specific areas of mathematics achievement, similarly, Das (1986), Patel (1997), Kasat (1991) and Abdul Majeed (1992) observed positive correlation between intelligence and Mathematics Achievement.

The issue of socio-economic status and its relationship to mathematics achievement remains as an intriguing aspect of students mathematics achievement among researchers. A number of studies have revealed significant correlation between SES and learning outcomes in mathematics (Eamon, 2005; Jeynes, 2002; Hochschild, 2003). On the contrary, Grootenboer & Hemmings (2007) and Mustafa (2009) found that students from the higher SES groups scored more marks than the low SES groups.

Significance of the Study: All the above studies reflect that in some cases, variables like intelligence, socio-economic status and gender differences has a role to play in mathematics achievement of students. Though it appears that the variables undertaken are significant predictors of mathematics achievement, yet they need to be subjected to scientific corroboration. This will be a significant contribution of this study to knowledge apart from providing empirically based suggestions.

. **Objectives:**

1. To identify the significant predictors of achievement in mathematics and their extent of predictability.
2. To study the relative influence of intelligence on students' achievement in mathematics.

Hypotheses:

1. None of the predictive variables will be found to be the significant predictors of students' achievement in mathematics.
2. There will be no significant effect of students' intelligence on their achievement in mathematics.

METHODOLOGY: Descriptive Survey Method was used as a research design for the study. In order to generalize the findings on the whole population, data collected on a sample of respondents was the true representative of the target population. The target population of the study was the senior secondary students studying in senior secondary schools of Moradabad city, U.P (India). A sample of 123 students was randomly selected out of 5 senior secondary C.B.S.E. affiliated schools. The sample consisted of 66 males and 57 females.

Research Assessment Tools: The researcher used the standardized tools for the collection of data for the present study. Group test of intelligence by Ahuja (2009) was used to know the intelligence of the students. The socioeconomic status of the sample was obtained through socio-economic status scale (urban and rural) by Kalia and Sahu (2005) and High School C.B.S.E. board exam scores in Mathematics was considered as their achievement in Mathematics.

Statistical Techniques Used:

The researcher used the following statistical techniques for the analyses:

Multiple regression and linear regression were used to know the strength of the predictors. With the help of Pearson product moment correlation the researcher was able to determine the relationship between dependent and independent variables. While t test helped in knowing the significant differences between the variables.

DATA ANALYSIS AND FINDINGS:

Objective: 1. To identify the significant predictors of achievement in mathematics and their predictability.

Table 1: Intelligence and Socio-Economic Status as Predictors of Students Mathematics Achievement

R = 0.503 R Square = .253 Adjusted R Square = .241 Standard Error = 10.404						
Analysis of variance						
	Sum of square	Df	Mean square	F	Sig. value	Remark
Regression	4429.927	2	2214.963	20.323	0.000	*Significant (p<0.05)
Residual	13078.707	120	108.989	---	---	---
Total	17508.634	122	---	---	---	---

In the table 1, intelligence and socio-economic status together account for 25.3% of the total variance in students' achievement in Mathematics (R square = 0.253, p<0.05). The percentage is significant. Thus, in a students' high achievement in mathematics, intelligence and socio-economic status have a role to play. Hence, the null hypothesis is rejected here.

Objective 2: To study the relative influence of intelligence on students' achievement in Mathematics.

Table 2: Relative Influence of Intelligence on Students' Achievement in Mathematics

R = 0.490 R Square = .240 Adjusted R Square = .234 Standard Error = 10.484						
Analysis of variance						
	Sum of square	Df	Mean square	F	Sig. value	Remark
Regression	4209.982	1	4209.982	38.305	0.000	*Significant (p<0.05)
Residual	13298.652	121	109.906			
Total	17508.634	122				

In the table 2 above, students' intelligence alone accounts for 24.0% of the total variance of performance in mathematics (R square = 0.240, p< .05). This percentage is significant. Thus, high intelligence leads to high achievement in mathematics. Hence, rejecting the null hypothesis,

CONCLUSION AND SUGGESTIONS: Results of the present study revealed the significant contribution of intelligence and socio-economic status in students' mathematics achievement. Intelligence was found to be strong and significant predictor of mathematics achievement. On the other hand socio-economic status came out to be an insignificant predictor in mathematics achievement. Intelligence was found to be strongly and positively related to mathematics achievement but at the same time socio-economic status had weak but positive correlation with mathematics achievement while negative insignificant correlation existed between intelligence and socio-economic status of students. Gender differences were found to be significant in socio-economic status and students' mathematics achievement. The gender differences were insignificant in only intelligence.

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