

EXPLORING THE ROLE OF EDUCATIONAL ASPIRATION TO ENHANCE THE MATHEMATICS ACHIEVEMENT OF SECONDARY SCHOOL STUDENTS

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ABSTRACT

The present study was undertaken to explore the role of educational aspiration to enhance the mathematics achievement of secondary school students. Mathematics achievement was treated as the dependent variable, whereas educational aspiration (high, average and low) and demographic variable i.e. gender (Male & Female) were treated as independent variables. A descriptive survey method was employed for the present study. A sample of 400 students was taken using a multi-stage random sampling technique. Educational Aspiration Scale by Kumar (2012) [14] and Mathematics Achievement Test by Singh and Jaidka (2015) [23] were used to collect the data. Two-Way ANOVA with 3×2 factorial design was used to analyze the data. Levene's Test of Homogeneity of Variance was also applied to test the assumption of homogeneity of variance for ANOVA. It was found that there exists a significant effect of educational aspiration and gender on mathematics achievement of secondary school students. However, no significant interaction effect of educational aspiration and gender school was found. Teachers should provide personal attention and also proper guidance to the students with low mathematics achievement to utilize their energies in the right direction.

KEYWORDS: Educational Aspiration, Gender and Mathematics Achievement

INTRODUCTION

The term aspiration is a synonym to the words like goals, dreams, performance motivation, expectations, and intentions etc. With time, aspirations begin to decline as the child, now as the grown individual, matures in response to complexities of physical world and barriers and impediments in exercising choices and ensuring accomplishments. Aspiration refers to a strong desire to achieve something great or high (Kaur, 2012) [13]. It is a complex concept that can be defined as anything from abstract wishes and dreams to concrete plans and expectations (Atienza, 2006) [3]. The discrepancy between the goals achieved and the goals targeted by the individual that he/she expects to achieve refers to that person's level of aspiration (Dhanya & Rekha, 2011) [7]. Frank (1935) [8] explained, "Level of aspiration is the level of future performance in a familiar task, which an individual knowing his level of past performance in that task explicitly undertake to reach. Educational aspirations can be visualized as an element in the academic achievement motivation that catalyzes the desires for success (Abiola, 2014) [1]. Educational aspirations are the sum total of other levels of aspiration goals like occupational goals, career goals, wealth and lifestyle etc. (Mishra, 2013) [16] and are a reliable predictor of educational achievement (Abiola, 2014) [1]. Educational aspirations are early impressions of an individual's own academic caliber (Furlong & Cartmel, 1995) and the highest levels of education that he/she expects to achieve

(Furlong & Cartmel, 1995 [9]; Trusty, 2000 [25]; Ou & Reynolds, 2008 [18] and Beal & Crockett, 2010 [6]). Educational aspirations begin to take form quite early in child's academic career and start enhancing the possibility of his/her participation in available educational opportunities or pursuing the same also (Arbona, 2000) [2]. With time, the aspirations get crystalized and the way in which the aspirations take form to affect the behavior of the individual and influence the personality (Dhanya & Rekha, 2011) [7]. Educational aspiration is influenced by many factors such as personality, vocational interests, academic achievement and parents' socio-economic status etc.

Researchers have demonstrated that gender has a significant effect on educational aspiration (Goel (2004) [10]; Vaidya (2006) [24]. Singh & Sharma (2017) [21] examined the educational aspiration of 600 secondary school students of Jammu district. Bashir and Kaur (2017) [5] explored the interrelation of educational aspiration with a school environment of secondary school students. Findings of the study Singh, Pandey and Singh (2015) [22] analyzed a significant relationship between home environment and educational aspiration. Saikia (2015) [19] conducted a study on the level of educational aspiration in relation to gender and location. Mau and Bikos (2000) [15] analyzed vocational and educational aspiration of female and minority students and analyzed the educational and vocational aspirations on the basis of race, sex, school, and family. Review of the literature indicates that a few researches have been conducted to study the role of different factors in enhancing mathematics achievement of secondary school students. However, no quite similar studies on the subject of the present study have been done so far. Therefore, investigators decided to take the present problem to study the role of educational aspiration to enhance the mathematics achievement of secondary school students.

VARIABLES USED

- **Dependent Variable:** Mathematics Achievement
- **Independent Variables:** (a) Educational Aspiration [High, Average and Low]; (b) Gender [Male & Female]

OBJECTIVES OF THE STUDY

- To study the main effect of (a) educational aspiration [High, Average & Low] and (b) gender [Male & Female] on mathematics achievement among secondary school students.
- To find out the interaction effect of educational aspiration and gender on mathematics achievement among secondary school students.

HYPOTHESIS OF THE STUDY

- **H₀₁** There exists no significant main effect of (a) Educational Aspiration [High, Average & Low] and (b) Gender [Male & Female] on mathematics achievement among secondary school students.
- **H₀₂** There exists no significant interaction effect of educational aspiration and gender on mathematics achievement among secondary school students.

DESIGN AND METHODOLOGY

In the present study, a descriptive survey method is used. Multistage random sampling technique is used to select the sample of 400 studying in the school situated in Haryana. In order to analyze the data, two-way analysis of variance with 3×2 Factorial Design is used. The sample is further stratified on the basis of educational aspiration i.e. high educational aspiration (113), average educational aspiration (181) and low educational aspiration (106) and also on the basis of Gender i.e. Male (199) &Female (201). A layout of the factorial design used in the study for the variables i.e. educational aspiration and gender is given in the Figure. 1.

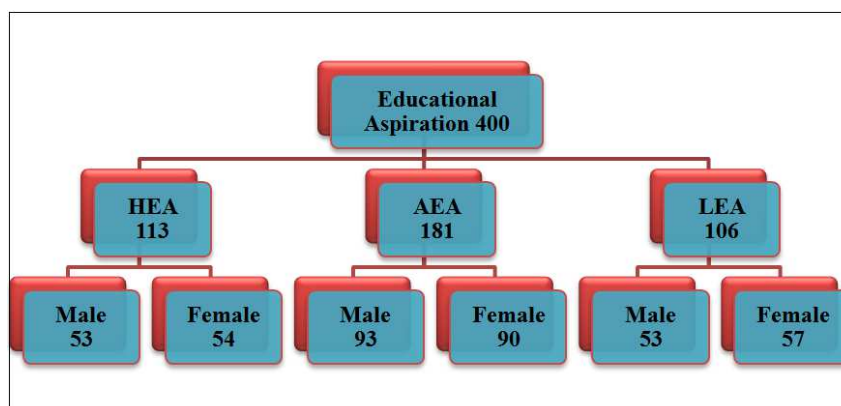


Figure 1: Schematic Layout of 3x2 Factorial Designs For Effect of Educational Aspiration and Gender on Achievement in Mathematics of Secondary School Students

TOOLS USED

Mathematics Achievement Test (MAT) developed by Parmvir and Jaidka (2015) [23] was used to assess the mathematics achievement of secondary school students. The test has 58 statements under 4 dimensions which pertain to the mathematics achievement of the students. The reliability coefficient was determined by Test-Retest method. The reliability coefficient was found to be 0.78. The correlation coefficients reveal that the mathematics achievement test possesses a reasonable level of concurrent validity.

Kumar Educational Aspiration Inventory developed by Pradeep Kumar (2012) [14] was used to measure the educational aspiration of school students. The inventory consists of 20 items. For scoring 1,2,3,4 be given to each alternative i.e. 1 for a, 2 for b, 3 for c and 4 for d to each item. Reliability of inventory was examined through Test-Retest method which was found to be 0.96. The validity for the inventory has been established by adopting the content approach.

STATISTICAL TECHNIQUES USED

The data was analyzed using descriptive as well as inferential statistics. The Two-Way Analysis of Variance (ANOVA) with 3×2 factorial design was computed using SPSS version 20 to study the main effect and interaction effects of the independent variables i.e. educational aspiration and gender on mathematics achievement of secondary school students. Before applying Two-Way ANOVA, Levene's Test of Homogeneity of Variance was used to test the assumption of homogeneity of variance. Wherever F-value was found significant, a t-test was employed for further investigation.

DATA ANALYSIS AND DISCUSSIONS

The objectives of the present study were to find out the main and interaction effects of educational aspiration and gender on mathematics achievement of secondary school students. The independent variables educational aspiration and gender are coded as A and B respectively. Independent variable educational aspiration (A) varies at three levels: High Educational Aspiration (A₁), Average Educational Aspiration (A₂) and Low Educational Aspiration (A₃). On the other hand, gender varies at two levels: Male (B₁) and Female (B₂) respectively. The Means and SDs of different sub-samples are presented in the Table-1 and Figure. 2. The summary of ANOVA (3×2 Factorial Design) is also presented in Table-2, which is further analyzed in terms of main effects and interaction effects.

Table 2: Means and SDs of Sub-Samples of 3×2 Design for Mathematics Achievement of School Students in Relation to Educational Aspiration (A) and Gender (B)

Educational Aspiration (A)	Gender (B)	N	Mean	SD
High Educational Aspiration (A ₁) 107	Male (B ₁)	53	49.86	9.09
	Female (B ₂)	54	47.27	10.43
Average Educational Aspiration (A ₂) 183	Male (B ₁)	93	39.80	7.41
	Female (B ₂)	90	35.14	9.45
Low Educational Aspiration (A ₃) 110	Male (B ₁)	53	30.73	9.72
	Female (B ₂)	57	29.17	10.40

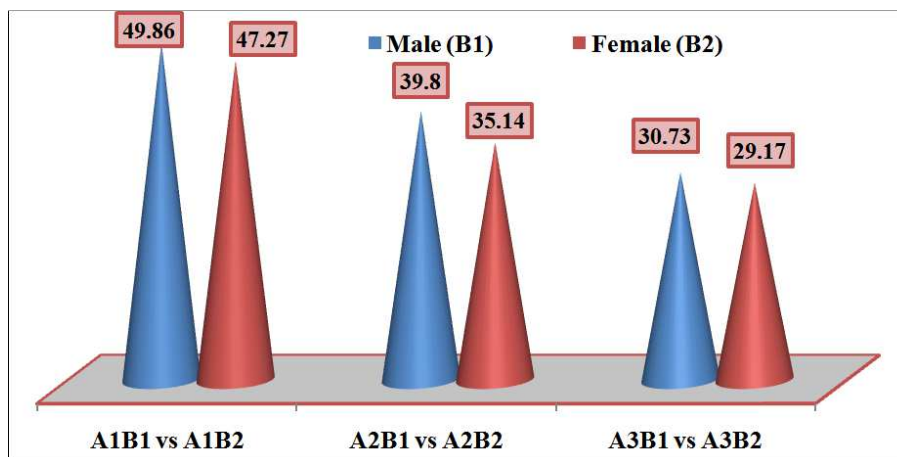


Figure 2: Mean Scores of Sub-Samples of 3x2 Factorial Design for Mathematics Achievement of School Students in Relation to Educational Aspiration and Gender

Table 3: Summary of Three-Way ANOVA (3x2 Factorial Design) for Mathematics Achievement of School Students in Relation to Educational Aspiration and Gender

Sources of Variance	df	Sum of Squares (SS)	Mean sum of Squares (MSS)	F-Ratios
Main Effects				
A(Educational Aspiration)	2	19061.755	9530.878	110.2**
B (Gender)	1	811.830	811.830	9.39**
Double Interaction Effects				
A × B Interaction	2	181.234	90.617	1.04 (NS)
Between Cells	5	20327.383
With in cells	394	34065.095	86.460
Total	399	

**Significant at 0.01 level; NS = Not Significant

Main Effects of Educational Aspiration and Gender on Mathematics Achievement of School Students

Educational Aspiration (A)

It is apparent from the Table-3 that F-ratio (110.23) highly significant at 0.01 level for the main effect of educational aspiration on achievement in mathematics of secondary school students. This means that educational aspiration has a significant independent effect upon achievement in mathematics. In this case the null hypothesis H_{01} (a), “There exists no significant effect of educational aspiration on achievement in mathematics of secondary school students **is not retained**.” However, this finding is antagonistic to the finding of Bakar and Mohamed (2004) [4] who found no significant differences in educational aspiration on achievement in mathematics. The present result is in consonance with the results of Hinson (2002) [11] who also revealed that educational aspiration had a significant and positive direct effect on mathematics achievement. Further, a t-test is employed to find out the significance difference between mean mathematics achievement scores for different groups. The results have been shown in Table 4.

Table 4: ‘t’-values for the Mean Scores of Achievement in Mathematics of Secondary School Students with Respect to Educational Aspiration

Sr. No.	Groups	N		Mean		SD		t-values
1.	HEA vs. AEA	107	183	48.56	37.51	9.83	8.77	9.89**
2.	HEA vs. LEA	107	110	48.56	29.92	9.83	10.06	13.78**
3.	AEA vs. LEA	183	110	37.51	29.92	8.77	10.06	6.77**

HEA: High Educational Aspiration AEA: Average Educational Aspiration

LEA: Low Educational Aspiration

From the Table - 4, it is clear that the t-value (9.89) for students having high educational aspiration and for students belonging average educational aspiration is significant at 0.01 level. An analysis of the mean scores makes it clear that students having high educational aspiration (48.56) possess higher mathematics achievement than students belonging to average educational aspiration (37.51). The same Table - 4 explains that t-value (13.78) for students having high educational aspiration and for students having low educational aspiration is found significant at 0.01 level leading to the conclusion that students of these groups differ significantly in relation to their mathematics achievement. From the comparison of mean scores, it is inferred that students with high educational aspiration have significantly higher mathematics achievement than their counterparts. As it is shown in the Table - 4 that t-value (6.77) for students having average educational aspiration and for students belonging low educational aspiration is found to be significant at 0.01 level. From the analysis of mean scores, it can be concluded that students with average educational aspiration are better than the students having low educational aspiration with respect to their mathematics achievement. The mean scores of the main effect corresponding to educational aspiration on mathematics achievement are also depicted in Figure 3.

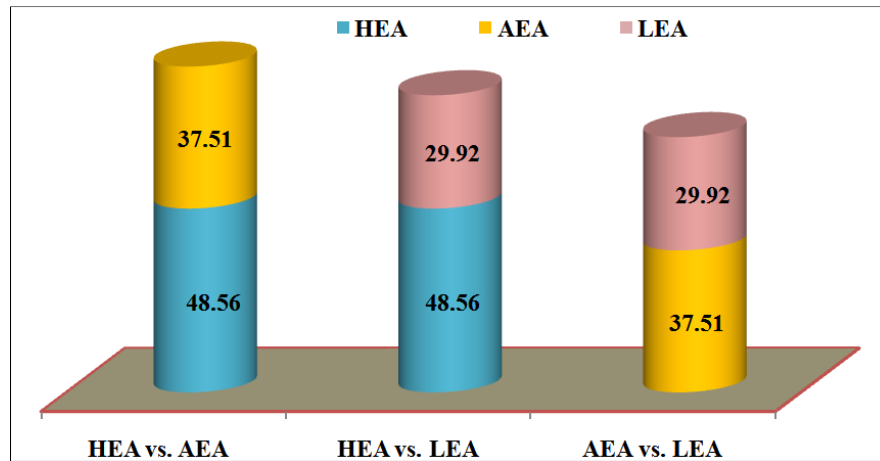


Figure 3: Mean Scores for Main Effect of Educational Aspiration on Achievement in Mathematics of Secondary School Students

Gender (B)

It is cogent from the Table - 3 that F-ratio (9.39) for the main effect of gender on achievement in mathematics is significant at 0.01 level which reveals that there is a significant difference between the mathematics achievement of male and female students. In this case, the null hypothesis H_{01} (b), "There exists no significant effect of gender on achievement in mathematics of secondary school students" **is not retained**. The present result is in congruence with the results of Jabor, Machtmes, Kungu, Buntat, and Nordin (2011) [12] who found that gender has the significant effect on achievement in mathematics. Results of the study Santos, Ursini, Ramirez, Gabriel Sanchez (2006) [20] reported no significant difference in mathematics achievement of students in relation to gender. For further exploration, the t-value was computed and has been given in the Table – 5

Table 5: 't'-value for the Mean Scores of Mathematics Achievement of Secondary School Students with Respect to Gender

Groups	N	Mean	SD	't'-value
Male Students	199	40.07	11.00	2.90**
Female Students	201	36.71	12.09	

Table - 5 illustrates that t-value (2.90) for the mean scores of achievement in mathematics between the male and female students is significant at 0.01 level. From the comparison of mean scores, it may, therefore, be easily inferred that male students (40.07) possess higher mathematics achievement than female students. The possible reason for the above result can be said that male students are provided better facilities at home as compared to female students. This makes their attitude more favorable towards mathematics as compared to female students. The present result is in contrast with the results of Mubeen, Saeed and Arif (2013) [17] who reported that female students have better mathematics achievement than male students. The mean scores of the main effect corresponding to gender on mathematics achievement are also depicted in Figure.4.

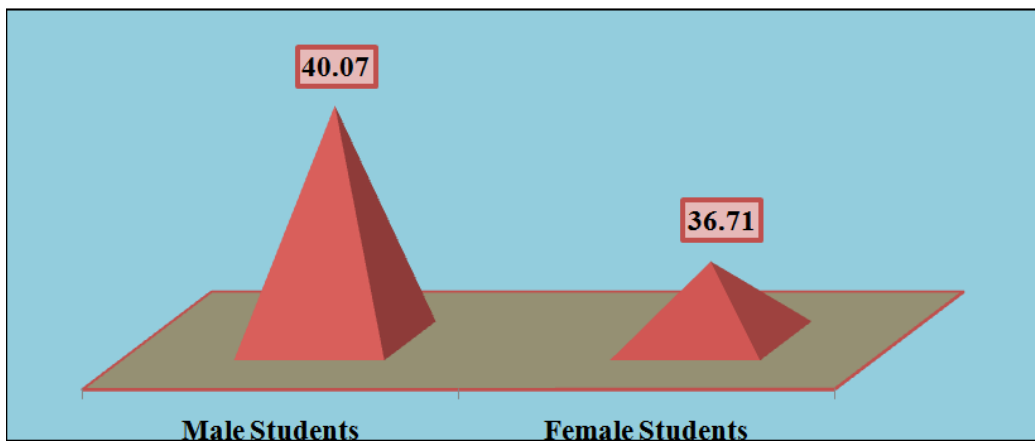


Figure 4: Mean Scores for Main Effect of Gender on Achievement in Mathematics of Secondary School Students

Double interaction effects of Educational Aspiration and Gender on Mathematics achievement of School Students Educational Aspiration and Gender (A x B)

It can be inferred from the Table - 3 that the F-ratio (1.04) for the interaction between educational aspiration & gender is found insignificant at 0.05 level leading to the inference that educational aspiration and gender do not interact significantly with each other in relation to mathematics achievement of school students. Therefore, the null hypothesis H_{02} "There exists no significant interaction effect of educational aspiration and gender on achievement in mathematics of secondary school students" is retained. Therefore, it is inferred that there is no significant interaction effect of educational aspiration and gender on mathematics achievement of secondary school students.

EDUCATIONAL IMPLICATIONS

The findings of the present study revealed that educational aspiration and gender have a significant effect on mathematics achievement. Male school students were found to be high in mathematics achievement as compared to female students. Male and female students should make the competitive environment, coordinate and exchange their knowledge from one another in mathematics teaching and learning. Girls students should be informed of the importance of mathematics and it is the basic tool for further education. Mathematics teaching and evaluation strategies should be bias-free. This way, males, and females will tend to see themselves as equals, capable of competing and collaborating in classroom activities. Hence, guidance and counseling services should be arranged for female students to enhance their mathematics achievement. Also, group discussions and career talks should be organized for female students to develop a clear understanding of different concepts among them. Teachers should provide personal attention and also proper guidance to the students with low mathematics achievement to utilize their energies in the right direction. Also, a teacher should adopt a student-centered classroom environment and provide opportunities for children to take part in various activities in the classroom independently. Schools and administrators should organize workshops and training for parents to guide about the various strategies which they should use for their child's development.

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