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Impact of gender, intelligence and stress on academic achievement of primary school students

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Abstract
The present study examines the influence of gender, intelligence and stress on academic achievement of primary school students of Narayanavanam and Nindra mandals of Chittoor District of Andhra Pradesh. The sample of the study consisted of 400 students (200 males and 200 females) from 8th class students. Intelligence was measured by Raven's Progressive Matrices (RPM) by Raven, J.C (1972) and stress was assessed by using Students Academic Stress Scale by Rajendran and Kaliappan (1990). The end results of 8th class were used for collecting data for academic achievement. The obtained data are quantitatively analyzed by using Means, SDs and Analysis of Variance (ANOVA). The findings of the study reveal that there is a significant influence of gender, intelligence and stress on academic achievement of primary school students.

Keywords: intelligence, academic achievement, primary school students

1. Introduction

In today's world exams are important aspect in the lives of the children, who are tested throughout the year. They have significant implications in shaping young people's future. The children are expected to achieve high due to the expectations and pressures from school and parents. This performance depends upon the children ability to grasps and pressure mounted on them by the parents.

This pressure is a significant issue for the students. Students in the pressure have lower levels threshold of anxiety when evaluated. Thus students perceive such expectations and experiences as stressful. In literature stress is Stress is the body's nonspecific response mechanism towards demands or strains made on itself or the environment (Selye, 1974 and Rosenham and Seligman, 1989) [32]. It is a process by which we perceive and cope with environmental threats and challenges (Myers, 2005). Stress is defined in Webster dictionary as "a condition typically characterized by symptoms of mental and physical tension or strain, as depression or hypertension, which can result from a reaction to a situation in which a person feels threatened, pressured, etc." An individual can be stressed in daily life in different ways, and stress can be viewed as the bodies' reaction both neurologically and physiologically to adapt to the new condition (Yakushko, Watson and Thompson, 2008) [39].

Students with more stressed behaviour show average or poor results in academic achievement. Their concentration never works properly in educational field (Signal, 1998). Though most of the research findings support the negative relationship between stress and academic achievement, (Blumberg & Flaherty (1985), Clark & Rieker, 1986; Linn & Zeppa, 1984, Felsten & Wilcox (1992) [15]. Struthers, Perry & Menec, 2000). Bell (1995), Dubois & Felner (1992) and Ganesan (1995) [16], Malik & Balda (2006) [23] few researches conclude against them. Bankston & Zhou (2000) [2] reported a significant positive relationship between stress and academic performance of college students. Kaplan & Sadock (2000) reported that an optimal level of stress can enhance learning ability. Gelow, Brown, Dowling & Torres (2009) [17] stated that a state of emotional stress was reported to have a significant positive relationship with reported school performance. In another research Womble (2003) [38] did not find any relationship between perceived stress and academic achievement of college students. Whereas the study of Rajni Kumari and Radhakanta Gartia (2012) [29] showed a positive correlation between stress and academic achievement. Significant difference exists in the academic achievement of students having high, moderate and less stress. Students with high and moderate stress performed better than the students having less stress. Further it was also found that stress and academic achievement are not mediated by gender.

The intelligence is a concept which has affected the life of every individual in all spheres of life. It is responsible for the academic outcome and finally the success in life. It helps us in combating the challenges of life and be a winner. There are individual differences in educational outcomes and to predict these differences, many studies have found intelligence was significantly correlated to academic achievement (Misra, 1977, Diseth, 2003, Panda, 2005) [27].

Research also studied gender and academic achievement Sahai (1985) [33]. Deve (1990) [12]. Rani (1992) [30]. Meena (2000) [24]. Burni *et al.* (2006); Birenbaum & Nasser (2006); Grurubasappa (2009) found significant positive relationship between gender and academic achievement, but few researchers have found a negative relationship e.g., Pavithran and Ferore (1965); Hosenfield, Koller and Baumer (1999) [20]. William *et al.* (2000) [37]. Ezeameyi (2002) [14]. Suneetha and Mayuri (2000) [36]. Chambers and Schreiber (2004) [10] Herbert and Stipek (2005) [19] Panigrahi (2005) [28]. Barkatsa, Kasimatis and Gialams (2009) [3] Naderi *et al.* (2009) [26] and Gurubasappa (2009) [18] found a negative relationship.

Researcher who studied gender, intelligence and academic achievement often found that intelligence has significant influence on academic achievement whereas gender has not significantly influenced the academic achievement (Ritu Chandra and Sheikh Azimmudin, 2013) [31].

Keeping the foresaid observations in mind the study was taken up with the following objectives.

2. Objectives

1. To study the influence of gender on academic achievement of primary school students.
2. To study the influence of intelligence and gender on academic achievement of primary school students.
3. To examine the impact of stress on academic achievement of primary school students.

3. Hypotheses

1. There would be significant impact of gender on academic achievement of primary school students
2. There would be significant impact of intelligence on academic achievement of primary school students
3. There would be significant impact of stress on academic achievement of primary school students.
4. There would be significant interaction effect among gender, intelligence and stress on academic achievement of primary school students.

4. Sample

The present study is descriptive in nature. It is conducted in Nidra Mandal of Chittoor District, Andhra Pradesh. The sample comprised of 400 students (male 200 and female 200) from primary schools of Chittoor District. Purposive sampling was used to collect the sample of the study.

5. Tools

To measure the intelligence of the subjects, the Standard Progressive Matrices by Raven, J.C. (1972) with Indian norms was adopted.

Stress was assessed by a 40 item rating scale which was originally developed by Kim (1970) was used in the present study. The scale was adopted to Indian conditions by Rajendran and Kaliappan (1990).

6. Academic Achievement

Academic Achievement marks obtained by students in their (end exams) annual examinations were collected from the school records.

7. Procedure

The investigator obtained formal permission from the school headmaster to obtain the VII class marks of VIII class students from the school records and approached the office staff.

The data was collected in three phases in the first phase the children was met personally and were explained the need for such study and informed that the data provided by them would be exclusively used for research purpose only.

In the second session they were given RPM and based on their scores they were divided into two groups. Those students who obtained 75 percentile were grouped as having high intelligence and those who got below 50 percentile points were grouped as low intelligence.

In the third phase they were given stress inventory based on their scores they were classified those students as having optimum stress and high stress. 160 the maximum possible score and the highest score on each factor would be 32 (4 x 8). Each factor has equal number of items, the higher the value of the score, the more the academic stress and vice-versa.

8. Statistical Analysis

The obtained data are analyzed quantitatively by using descriptive statistics, such as Mean and Standard Deviation and Inferential Statistics such Analysis of Variance (ANOVA) wherever necessary to test the hypotheses and the results are presented in the following pages.

9. Results and Discussion

Table 1: Means and Sds Academic Achievement Scores

		Low Intelligence		High Intelligence	
		Optimum Stress	**High Stress**	**Optimum Stress**	**High Stress**
Boys	MEAN	62.60	59.07	69.44	65.56
	S.D	14.80	15.32	13.52	13.57
Girls	MEAN	67.82	67.74	80.19	70.51
	S.D	10.24	11.62	14.08	13.86

Grand Means

Boys = 64.17	Low Intelligence = 64.31	Optimum Stress = 70.01
Girls = 71.56	High Intelligence = 71.42	High Stress = 65.72

A close observation of table –2 clearly shows that primary school girls with high intelligence with optimum stress obtained a high mean of (80.19) compared to primary school boys with low intelligence with high stress (59.07). This indicates that primary school girls with high intelligence with optimum stress have better achievement compared to primary school boys with high intelligence with high stress.

There are mean differences among the eight groups of subjects with regard to academic achievement. However in order to test whether there are any significant differences among the eight groups of subjects in their academic achievement, data are further subjected to analysis of variance and the results are presented in table-3.

Table 3: Summary of Analysis of Variance in relation to Academic Achievement

Source	Type of III Sum of Squares	df	Mean Square	F value
Gender (A)	5225.781	1	5225.781	28.356**
Intelligence (B)	4830.794	1	4830.794	26.213**
Stress (C)	1662.771	1	1662.771	9.023**
Gender x Intelligence	17.184	1	17.184	0.093@
Gender x Stress	25.559	1	25.559	0.139@
Intelligence x Stress	569.147	1	569.147	3.088@
Gender x Intelligence x Stress	451.545	1	451.545	2.450@
Error	72241.900	392	184.291	-
Corrected Total	85169.190	399	-	-

** - Indicates Significant at 0.01 level @ - Indicates Not Significant

The "F" value of 28.356 for the variable gender is significant at 0.01 level, indicating that gender would significantly influence the academic achievement of primary school students. It means that there is a significant impact of gender on academic achievement of primary school students. Primary school girls are better in achievement (71.56) compared to primary school boys (64.17). Thus the hypothesis -1 "*there would be significant impact of gender on academic achievement of primary school students*" is accepted as warranted by the results. The finding of the present study in line with earlier findings of Brunie et al. (2006) and Joshi and Srivastava (2009) who also found significant difference between male and females with regard to academic achievement.

The "F" value of 26.213 for the variable intelligence is significant at 0.01 level, indicating that intelligence would significantly influence the achievement of primary school students. It means that there is significant difference between high and low intelligent students in academic achievement. High intelligence of primary school students have better academic achievement (71.42) compared to primary school students with low intelligence (64.31). Thus the hypothesis -2 "*there would be significant impact of intelligence on academic achievement of primary school students*" is accepted as warranted by the results. The finding of the present study consistent with earlier studies of Rani (1992) [30] and Ritu Chandra and Sheikh Azimmudin (2013) [31] found that there is a significant influence of intelligence on academic achievement of the primary school students.

The "F" value of 9.023 for the variable stress is significant at 0.01 level, indicating that academic achievement of primary school students would significantly influenced by stress. It means that there is a significant difference between high and optimum stress category students on achievement. Primary school students with optimum stress have better academic achievement (70.01) compared to primary school students with high stress (65.72). Thus the hypothesis -3 "*there would be significant impact of stress on academic achievement of primary school students*" is accepted as warranted by the results. The findings of the study are in line with earlier studies of Bankston and Zhou (2002) [2]. Rajni Kumari and Radhakanta Gartia (2012) [29] which showed a positive correlation between stress and academic achievement. Significant difference exists in the academic achievement of students having high, moderate and less stress. Students with high and moderate stress performed better than the students having less stress.

The "F" value for interaction between gender and intelligence is 0.093, the "F" value of interaction between gender and stress is 0.139, the "F" value for interaction between intelligence and stress is 3.088, the "F" value for second order interaction between gender, intelligence and stress is 2.450, which are not significant, indicating that there is no significant interaction among gender, intelligence and stress with regard academic achievement. Thus the hypothesis- 4 "*there would be significant interaction effect among gender, intelligence and stress on academic achievement of primary school students*" is rejected.

10. Conclusions

Based on the results discussed above it can be concluded as follows:

1. Primary school girls had higher academic achievement compared to primary school boys.
2. Primary school students with high intelligence have better academic achievement than the primary school students with low intelligence.
3. Primary school students with low stress have better academic achievement than the primary school students with high stress.
4. There is no interaction effect among gender, intelligence and stress on academic achievement of primary school students.

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