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Prediction of Study Involvement of Higher-Secondary Science Students

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ABSTRACT

The study aimed to find whether the study involvement can be statistically predicted by higher secondary science students' perceived school environment, educational, emotional and social adjustment, gender and educational grade. Stratified random sample of 200 higher secondary science students aged 16 and 19 years belonging to middle socio- economic status families of Kolkata was selected. Socio-Economic Status Scale was administered to determine the socio-economic status of students for controlling it. School Environment Inventory was administered to assess students' perception of their school environment (Domains- creative stimulation, cognitive encouragement, acceptance, permissiveness, rejection and control), educational, emotional and social adjustment was assessed by Adjustment Inventory for School Students and study involvement of participants was assessed by Study Involvement Inventory. Mean, Standard Deviation, Product –Moment Correlation, Shapiro-Wilk Normality Test and Multiple Regression Analysis were conducted. Result indicated that Study involvement is significantly predicted by the domains of school environment, aspects of adjustment, gender and grade of participants.

Keywords: Higher secondary science students, Gender, Educational grade

INTRODUCTION

Study involvement is an important variable in education. It determines the extent to which students do well in academic pursuits. These are many studies on academic achievement but study involvement as subject of study escapes attention. Operationally speaking study involvement refers to extent of involvement that is motivated participation and emotional connectedness of pupils to their scholastic pursuits (Bhatnagar, 2004). A survey of researches on study involvement and its determinants show the following- Booker (2006) found African-American adolescents' school belongingness to be significantly linked with perceived teacher support, peer- relations, own motivation, engagement and academic performance. Dorman and Adams (2004) found that students' perception of improvement in classroom environments were related with higher levels of academic efficacy. Ames and Archer (1988) worked with 8th through 11th graders. Students who perceived on emphasis on mastery goals in classroom were more study involved- reporting more use of effective strategies, preferring challenging tasks, having more positive attitude towards class and strongly believing that success results from effort. However, Lee (2008) found students' perceived authoritative socialization style at school to be positively associated with behavioral and emotional engagement with learning but not with cognitive encouragement for 9th and 10th graders.

Survey of researches on study involvement and students' adjustment shows the following. Raju and Rahamtulla (2007) found that students' problems in adjustment and study involvement were associated with the classes they were studying in, the language of instruction and the type of management at school. Govindhrajan and Babu (2014) found positive and

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significant relation between study involvements in biology practical and adjustment of higher-secondary students. Xi Lin *et al.* (2019), found that students' academic self-confidence, confidence in future success and confidence in making correct decisions in academics influence their intention to actively master learning (cross referenced from Chandan and Shivappa, 2020).

Researchers surveyed showed the influence of class in school and gender of students in their study involvement. Visvanathan and Krishna (2018) and Mallick *et al.* (2024) did not find any difference between male and female students in study involvement. These findings have to be verified. Raju and Rahamtulla (2007) found variables including class in school in school to be linked with study involvement- student adjustment relation. The survey of researches gives us a glimpse of the state of researches in the field. It is a lively field of research in India but an old area of research in the West. Studies carried out in the West are marked by superior methodology. Hence the present study is an attempt to plug the lacuna.

Research Objective:

To find out whether study involvement can be statistically predicted by higher-secondary science students' perceived school environment, educational, emotional and social adjustment, gender and educational grade.

METHODOLOGY

Participants:

The number of participants is 200 (100 males and 100 females) aged between 16 and 19 years. Among them 100 students are of grade XI and 100students of grade XII. They study in Science stream of higher secondary level at schools and belong to middle socio-economic status families of Kolkata. The nature of sample stratified random. Only students of Science were sampled to control extraneous variable of stream of study. Likewise the socio-economic status and city of residence were controlled to control the related extraneous sources.

Tools:

The selected tools are:

(a) Study Involvement Inventory (Bhatnagar, 2004)
(b) School Environment Inventory (Misra, 2002)
(c) Adjustment Inventory for School students (Sinha and Singh, 2007)
(d) The Socio-Economic Status Scale (Meenakshi, 2004)

(a) Study Involvement Inventory by Dr. Asha Bhatnagar (2004): It was administer to measure the study involvement of sampled students. It contains 40 items related to need areas *viz.,* abasement, achievement, affiliation, aggression, autonomy, deference, nurturance, order, recognition and succorance. There are four items pertaining to each need. There are two negatively worded and 38 positively worded items in the inventory. Response options for each item are Yes, Undecided and No- one of which the testee has to indicate. There is no time limit. It was standardized. It is claimed to have high content and construct validity. Percentile norms are based on a quota sample of 600 students of class X (Bhatnagar, 2004).

(b) **School Environment Inventory** by Dr. Karuna Shankar Misra (2001): It was administered to assess students' perception of their school environment. It comprises 70 items covering six dimensions of school environment *viz.,* creative stimulation, cognitive encouragement, acceptance, permissiveness, rejection and control. Response options for each item are Always, often, sometimes, very rarely and never- one of which the testee has to indicate. There is no time limit. Higher scores indicate greater perceived presence of creative stimulation, cognitive encouragement, acceptance, permissiveness, rejection and control. It was standardized on 102 girls and 100 boys studying in intermediate classes. Norms are in stanine (Misra, 2002).

(c) **Adjustment Inventory for School students** by A.K.P. Sinha and R.P. Singh (2007) : It was used to assess emotional, social, educational and total adjustment of sampled school students. It comprises 60 items with 20 each in the areas of emotional, social and educational adjustment. Response options for each item are Yes and No- one of which the testee has to indicate. There is no time limit. Higher score indicates maladjustment. It was standardized. Percentile

norms are based on random sample of 1950 pupils aged 14-18 years of classes IX-XI of 40 schools in Bihar. Chi-square tests revealed that distributions of scores were more or less normal (Sinha and Singh, 2007) .

(d) **The Socio-Economic Status Scale** by Dr. Meenakshi (2004) : The tool was used to measure the socio-economic status of adolescents. It comprises items spanning four areas *viz.,* finance, property, education and social status. The scale has been standardized on a sample of 1127 students of class VIII through XII. It was standardized. There is no time limit Meenakshi (2004).

Techniques of Statistical Analysis:

Mean, Standard Deviation, Product–Moment Correlation, Shapiro-Wilk Normality Test and Multiple Regression Analysis.

RESULTS AND DISCUSSION

Table 1 reveals that from observation of mean values of the dimensions of perceived school environment, adjustment and study involvement of participant higher secondary science students it seems participating science students perceive slightly more of creative stimulation, cognitive encouragement, acceptance and control in school; they manifest somewhat greater educational adjustment and overall maladjustment but more study involvement. The standard deviation or S.D. values are not very high indicating moderate homogeneity of variance. It suggests that intra-group variability of scores on the variables is not high.

Table 2 reveals that science students' perceived creative stimulation, cognitive encouragement, acceptance, permissiveness, and control at school are significantly positively related with their study involvement and perceived rejecting school environment and study involvement of pupils of science are significantly negatively correlated. It manifests that social, educational and total adjustment of science students are significantly negatively related with their study involvement. Emotional adjustment and study involvement of science students have been found non-significantly related.

Table 3 shows the results of the Shapiro-Wilk Normality Test. The W value of 0.994 is close to 1 indicates a congruence with normal distribution. The associated high p-value of 0.554 indicates that the null hypothesis cannot be rejected. Thus a normal distribution is surmised. Having assured of normality of distribution, Multiple Regression Analysis was carried out (Table 4 and 5). The dependent variable was Study Involvement

Table 1 : Mean and Standard Deviation Values of Variables

	Creative Stimulation	Cognitive Encouragement	Acceptance	Permissiveness	Rejection	Control	Emotional Adjustment	Social Adjustment	Educational Adjustment	Adjustment Total	Study Involvement
Mean	48.2	27.41	24.79	20.94	18.15	25.27	6.53	6.9	7.25	20.67	49.48
SD	10.31	5.78	5.85	5.7	5.67	5.06	3.15	2.94	3.3	7.04	6.37

Table 2: Correlation Matrix for Science Students (N=200)

	Creative Stimulation	Cognitive Encouragement	Acceptance	Permissiveness	Rejection	Control	Emotional Adjustment	Social Adjustment	Educational Adjustment	Adjustment Total	Study Involvement
Study Involvement	0.34**	0.26**	0.28**	0.29**	-0.16*	0.25**	-0.04	-0.18*	-0.22**	-0.20**	1

*p<.05: **p<.01

Table 3 : Normality Test (Shapiro-Wilk)

Statistic	p
0.994	0.554

and the predictors were domains of school environment (creative stimulation, cognitive encouragement, acceptance, permissiveness, rejection and control), aspects of Adjustment (Educational, Emotional and Social Adjustment), Gender (Female and Male) and Grade (Classes XI and XII).

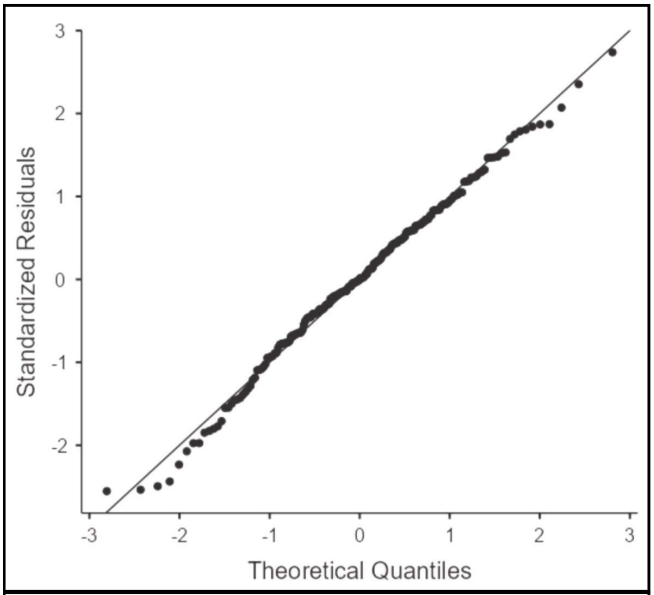

Fig. 1 : Quantile – Quantile plot

Table 4 shows the Y-Intercept to be significant. Among the predictors, Creative Stimulation (B=0.1208, t- 1.760, p= 0.080) is perhaps the most dominant. The more the Creative Stimulation at school the more is Study Involvement. The Standard Error values show accuracy of prediction. Low values of Variance Inflation Factor shows lack of multicollinearity. Except for Creative Stimulation, Cognitive Encouragement and Educational Adjustment, Tolerance values are high also indicating lack of multicollinearity.

In Table 5, The Coefficient of Multiple Regression (R) is significant at 0.01 level indicating that the independent variable and predictors are closely related. The Coefficient of Multiple Determination (R^2) indicates that 16.8% of the variance in Study Involvement scores of the participants can be accounted for by the predictors that are domains of school environment, aspects of adjustment, gender and grade of participants. The Adjusted R^2 shows that 11.9% of Study Involvement scores can be predicted without addition of more variables than required. F-value is 3.44 (p<.001) showing

Table 4 : B Coefficient, Variance Inflation Factor and Tolerance Values – Dependent Variable: Study Involvement (N=200)

Predictor	Estimate	SE	t	p	VIF	Tolerance
Intercept[a]	41.1340	4.1428	9.929	<.001		
Stimulation	0.1208	0.0687	1.760	0.080	2.79	0.359
Encouragement	-0.0663	0.1161	-0.571	0.569	2.50	0.400
Permissiveness	0.1335	0.0920	1.451	0.148	1.53	0.654
Acceptance	0.0484	0.1136	0.426	0.670	2.45	0.408
Rejection	-0.0143	0.0896	-0.159	0.874	1.43	0.697
Control	0.1061	0.1099	0.965	0.336	1.72	0.582
Gender						
2 – 1	-0.2575	0.9121	-0.282	0.778	1.16	0.861
Grade						
2 – 1	0.9742	0.8905	1.094	0.275	1.11	0.903
Edu.Adj	-0.2449	0.1701	-1.440	0.152	1.75	0.571
Emo.Adj	0.1501	0.1581	0.949	0.344	1.38	0.724
Soc.Adj	-0.2381	0.1636	-1.455	0.147	1.28	0.780

[a]Represents reference level

SE: Standard Error, VIF: Variance Inflation Factor

Table 5: Linear Regression

Model Fit Measures

				Overall Model Test			
Model	R	R^2	Adjusted R^2	F	df1	df2	p
1	0.409	0.168	0.119	3.44	11	188	<.001

Note. Models estimated using sample size of N=200

R: Coefficient of Multiple Correlation, R^2: Coefficient of Multiple Determination, df: Degrees of freedom

significance. Thus the prediction is significant. The research hypothesis is supported. This finding agrees with those of Dorman and Adams (2004), Raju and Rahamtulla (2007) and Govindhrajan and Babu (2014).

Conclusion:

Study involvement is significantly predicted by the domains of school environment, aspects of adjustment, gender and grade of participants. Lacuna of the study is size of the sample is not very large. Besides, the difference in predictive study between state run and privately run schools could be studied in future by the present investigators.

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