



IMPACTS OF PARENTS ON ACADEMIC PERFORMANCE AT DEBRE BERHAN GENERAL SECONDARY SCHOOL

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Abstract

Education is process through which human kind transmit experience, new findings and value accumulate over time with the aim of individuals and societies, to make all around participation in the development process. Parent has vital roles to play in the life of a child. This study aimed at to investigate the impact of parents on the academic performances of their children's at Debre Behan General Secondary School. Descriptive and inferential statistics was used. Income level, having parents, rate of money given to satisfy basic and educational materials ,parents occupation, family size, parents educational level, and parents way of giving motivation have significant effect on academic achievement of students. Improvement of socio-economic status of parents that help students their academic achievement.

Keywords: *Impacts of parents, academic achievement, Parents.*

1. INTRODUCTION

Education is a process by which man transmits his experiences, new findings, and values accumulated over years, in his struggle for survival and development, through generation (Tekeste 1996). Furthermore, Mamo (cited in Bezabih, 2006) stated that education is a strong instrument used to empower human beings to foster ecological sustainable development; to provide democracy, justice, gender, equality, social and economic development. Family is the primary cell of society where the child's upbringing must begin since his birth, still in cradle.

According to V. Hugo, the person's principles established since childhood are like letters engraved in the bark of a young tree, which grow, enlarge with it making its integral part. Therefore, right beginning makes the most important part of upbringing/education. Failure of the parents to meet these specific needs can have wide-ranging and long-lasting negative effects (Chris Theisen, 2009). Because parent in the home are children first teacher. As a child move from infant to toddler and then to a preschooler, he learns how to speak, listen, write and read which latter develop the child to achieve academically. Influence of parents on children school achievement is well documented in numerous studies. Parents are the first crucial individuals who take the real responsibility regarding to their children learning. Effective "school parents' interaction program" could encourage parents to play their critical role to result in higher academic and non-academic achievement for students. Therefore, children's academic achievement is influenced either positively or negatively by socio-economic status of parents. Students' academic performance can be improved through continuous support of parents. Regarding this, Gottfried, Fleming, and Gottfried (1994) reveal that for better academic performance, parents should be very closer to their children.

Accordingly, the study is in general aimed at to engage on the following basic questions of their children (students). The general objective of this study is to analyze the impact of parent's on the academic performance of their children in Debre Behan General Secondary School. Specifically the paper aimed to answer the following research questions with respect statistical data analyses:

- Is there any significant relationship between socio-economic status of parents and their children's academic achievement?

•Which of the variable/s is/are highly influential on the academic achievement of students?

2. Data and Methods

Study Design

For this study, cross sectional data was done it is important for the values of one or more than one variable are collected for several sample units at the same points in time (one time shoot), just the researcher collects the data from the respondents directly in a particular time. In this study, the target population means that total number of students in Debre Behan General Secondary school in academic year of 2009 E.C.

Data Source

We used primary data by designed questionnaire form Debre Behan General Secondary School students. Primary data refers to the data when researcher collects data directly from his observations and experience. The type of data that was employed under this study is primary data from sampled respondents in the college of engineering. The data was collected by data collectors using a standard, structured and pre-tested questionnaire.

Sampling Technique

Sampling technique is a system of taking small ratio of observation from large population with the aim of getting information of those large populations from the sampled observation by using some statistical techniques. The target population for this study was all students except first year student's grade 9th and 10th (2367 students). Before the actual data collection, emphasis was done on the determination of sample size depending on the purpose of the study, available resource and precision required. In this study, a probabilistic sampling (simple random sampling) technique was adopted as an appropriate sampling method for selecting a representative sample of the students.

Sample size Determination

Determining the sample size for a study is a crucial component of study design. The goal is to include sufficient numbers of subjects so that statistically significant results can be detected. In order to have an optimum sample size, there are a number of

issues/points one has to take into account. Some of the issues are: objective of the research, design of the research, cost constraint, plan for statistical analysis, and degree of precision required for generalization, degree of confidence with which to conclude etc. As mentioned in sampling design, sample size determination technique used in this study was stratified random sampling techniques. Accordingly, the sample size determination formula adopted for this study was using simple random sampling,

$$n_o = \frac{(Z_{\alpha/2})^2 S^2}{e^2}$$

Where;

- $Z_{\alpha/2}$: level of significance
- S^2 : estimated variances for 20 students by asking the response variable (what is your GPA) conduct pilot survey
- E :margin of error

$$n_o = \frac{(1.96)^2 * 0.769}{0.0025} = 118$$

2.5. Study Variables

The dependent variable for this study was average mark of the students scored in first semester in 2009 E.C. The independent variables for the study was list out below with their categories

- Sex[0=Male,1=Female]
- Age[Continuous]
- Grade level[0=Nine,1=Ten]
- Having parents[0=Yes,1=No]
- Mother Educational level[0=Illiterate,1=Elementary &secondary,2=College diploma 3=other]
- Father Educational level[0=Illiterate,1=Elementary &secondary,2=College diploma,3=Other]
- Mother Occupation[0=Farmer,1=Employee,2=Merchant ,3=Other]
- Father Occupation[0=Farmer,1=Employee,2=Merchant ,3=Other]
- Family size [Continuous]
- Rate of money given to respondent

- Way of giving motivation to students[0=Byrewarding,1=By enforcing,2=By advising,3=Other]
- Parents advise for their children's [0=Yes,1=No]
- Family's income per month in birr[Continuous]
- Parents follow up their children's [0=Yes,1=No]
- Have you leisure time [0=Yes,1=No]

2.6. Statistical Data Analysis

2.6.1. Descriptive Statistics

Deals with describing data without attempting to infer anything that goes beyond the given set of data, consists of collection, organization, summarization and presentation of data to describe data using table, graph, pie chart and by using different charts.

2.6.2. Multiple Linear Regression Model

Multiple linear regression (MLR) is multivariate statistical technique for examine the linear correlation between two or more independent variables and a single dependent variable. The goal of multiple linear regressions is to model the relationship between predictor variables and response variable.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k + \epsilon_i$$

Where;

- Y = response variable
- $\beta_1, \beta_2, \dots, \beta_k$, are unknown parameters. $i = 1, 2 \dots k$
- $X_1, X_2 \dots X_k$, are explanatory variables
- ϵ_i = error term

Assumptions of multiple linear regressions

- Relationship between the dependent variable and the predictor variables must have be linear
- Error terms (ϵ_i) must have constant variance (Homoscedasticity)
- Error terms are normally distributed with mean zero and constant variance

- No exact linear relationship exists between independent variables (No Multicollinearity)
- The error $\varepsilon_1, \varepsilon_2 \dots \varepsilon_i$ are independent that means their pair covariance are zero

Hypothesis testing for ANOVA

Test of overall model adequacy

- $H_0: \beta_0 = \beta_1 = \beta_2 = \dots = \beta_k = 0$ Vs
 H_1 : At least one of β_i is different from zero for $i = 0, 1, 2 \dots, k$
- Specifies level of significant.
- Test statistics = $F_{cal} = MSR / MSE$ where, MSR With $k - 1$ degree of freedom, MSE with $n - k$ degree of freedom
- Decision: if $F_{cal} > F_{tab}$ then, H_0 will be rejected
- Conclusion

Test of individual parameter

- $H_0: \beta_i = 0$ Vs. $H_1: \beta_i \neq 0. i = 1, 2, 3 \dots p$
- Specify α level of significant
- Test statistics
- Decision at a given significant level (α)
- Conclusion

2.7. Parameter estimation of the model

The model parameters were estimated by using least square estimation method in order estimate the unknown parameter for multiple linear regressions. Due to difficult to work manually like simple linear regression. The ordinary least square estimation can be work as after a certain procedure

$$\hat{\beta} = (x'x)^{-1}x'y$$

Where;

- y is vector of observation of academic achievement
- $y(n \times p)$, invertible matrix of coefficient
- x is matrix of factors affecting the academic achievement
- β are vectors of the coefficients of the regresses (independents)
- $\beta (p \times 1)$ Vectors of regression that was estimated from the data

2.8. Model adequacy checking

This is a method of checking whether the fitted model is adequate for modeling the data or not and whether the required assumptions are valid. Residual analysis is a measure of variability that left unexplained by the regression model. Thus, any departures from the assumption on the errors should show up in the residuals. Its analysis is effective through plotting. These are:

- Normal probability plot
- Plot of residuals against fitted value
- Variance Inflation Factor
- Coefficient of determination (R^2) = $\frac{\text{Explain variation}}{\text{Total variation}}$
- Adjusted coefficient of determination (R^2_{adj}) = $1 - (1 - R^2) \frac{(n-1)}{(n-k)}$

3. Result and Discussion

The main objective of the study is identifying factors affecting the impact of parent's student's academic performance of students in Debre Berhan General Secondary School. Both descriptive and inferential statistical analyses were employed. SPSS v.20 was used for analysis purpose. Descriptive statistics have been used to assess the existing situation of academic performance of students, whereas multiple linear regressions have been used to investigate the relationship between academic performance and the set of predictor variables.

3.1 Descriptive Result

Descriptive result of the study shows that the average GPA of students is with maximum of and minimum of.

3.2 Multiple linear regressions

It is an advanced portion of statistics which can be generalized and concluded about the population from the sample results.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	0.937	0.879	0.861	4.93

Table 1. Model summary

R =0.937, model is adequate because R^2 value is become unity that is greater than 0.70. It indicates that about 94% of the variability in the average mark of student is explained by the variability of the independent variables in the estimated regression and 6% explained by other non-explained factors out of our determined independent variable.

Model	Sum of Squares	Degree of freedom	Mean Square	F	Sig.
1 Regression	17968.083	15	1197.872	49.313	0.000
Residual	2477.680	102	24.291		
Total	20445.763	117			

Table 2. ANOVA

The Sig. value 0.000 indicates that combination of these variables significantly ($p < .001$) predicts the dependent variable (average mark of students). Based on the analysis of variance tables we have to test the overall test of the regression model. From the ANOVA tables, p-value is 0.000 is less than the level of significance (0.05). Therefore, we can conclude that at 5% level of significance at least one of the β_j has significance impact on the regression model. The overall model is statistically significance for the data.

		Average mark of respondent	Average income of family per month	Family size	Age of respondent
Average mark of respondent	Pearson Correlation	1	.742**	-.876**	.421**
	Sig. (2-tailed)		.000	.000	.000
	N	118	118	118	118
Average income of family per month	Pearson Correlation	.742**	1	-.688**	.455**
	Sig. (2-tailed)	.000		.000	.000
	N	118	118	118	118
Family size	Pearson Correlation	-.876**	-.688**	1	-.369**
	Sig. (2-tailed)	.000	.000		.000
	N	118	118	118	118
Age of respondent	Pearson Correlation	.421**	.455**	-.369**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	118	118	118	118

Table 3. Correlations for continuous variables

** . Correlation is significant at the 0.01 level (2-tailed).

There is highly correlate between average mark of students and a predictor variable (family size of respondent, average income of family) then satisfies the assumption of linearity

Model	Unstandardized Coefficients		T test	Sig.
	B	Std. Error		
(Constant)	86.479	4.825	17.922	.000
Sex of respondent	-1.460	1.435	-1.018	.312
Age of respondent	-.171	.217	-.788	.432
Student grade level	-1.136	.902	-1.260	.211
Do you have parents	-3.971	1.358	-2.924	.004
Rate of money given to satisfy basic and education materials	-4.667	1.669	-2.797	.006
Average income of family per month	.001	.000	1.671	.024
Family size	-2.391	.410	-5.828	.000
Parents advice their children	.670	.984	.681	.498
Parents follow up their children	-.771	.965	-.799	.426
Have you leisure time	3.025	1.315	2.300	.098
Way of giving motivation by rewarding	-2.631	1.684	-1.562	.122
Way of giving motivation by enforce	-5.756	1.622	-3.550	.001
Way of giving motivation by other	6.790	2.299	2.953	.004
Mothers education elementary &secondary	-1.453	1.112	-1.307	.194
Mothers education collage	-6.119	2.194	-2.789	.006
Fathers education elementary &secondary	2.145	1.291	1.662	.100
Fathers education collage	3.869	1.470	2.632	.010
Fathers education other	6.439	1.888	3.410	.001
Mothers occupation employee	.374	1.363	.274	.785
Mothers occupation merchant	-2.734	.993	-2.753	.007
Mothers occupation other	-2.987	1.811	-1.650	.102
Fathers occupation farmer	.906	1.618	.560	.577
Fathers occupation merchant	2.854	1.451	1.967	.025
Fathers occupation other	.872	2.041	.427	.670

Table 4: Coefficient table

The fitted regression model given by:

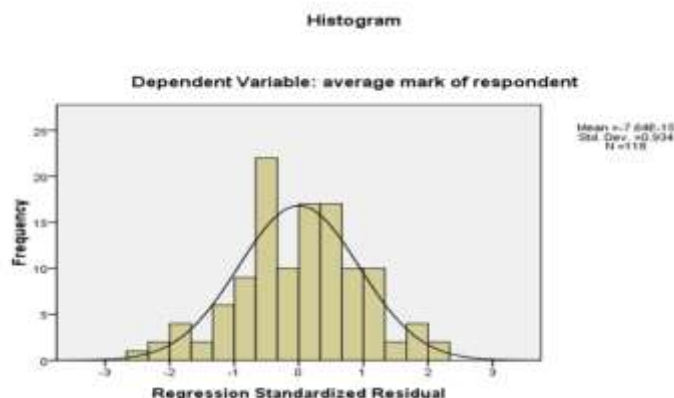
$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + \beta_7X_7 + \beta_8X_8 + \dots + \beta_{15}X_{15}$$

Where; Y= average mark of students that score at first semester, X1= father occupation, X2 = mother occupation, X3=father education level, X4=mother education level, X5=rate of money given to respondent, X6=family income per month, X7 =family size, X8=parents follow up, X9=way of giving motivation, X10=leisure time, X11=age, X12=sex, X13=having parents, X14=grade level, and X15=parents advise their children.

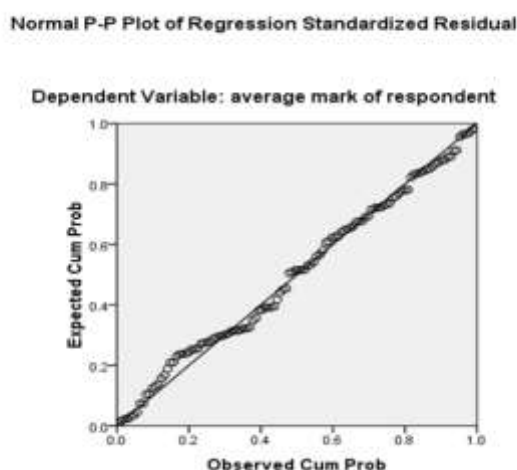
- **-4.667** indicates that rate of money given to satisfy basic and education materials for student 4.667 greater to have good average mark than those who have not rate of money given to satisfy basic and education materials. **0.001** indicates that as per unit change in family income per month the average mark of student's increase by the amount of 0.001.
- **-3.971** indicate those students who have parents are about 3.971 times more likely to have good average mark than those who have not parents.
- $\beta_{32} = 3.869$ tells us that the mean average mark of student in the fathers education collage is more about 1.393 than the mean average mark of students whose is fathers education illiterate.
- $\beta_{33} = 6.439$ shows students whose fathers education others are 6.439 times more likely to have good average mark of students as compared to students whose fathers education are illiterate .
- $\beta_{42} = -6.119$ shows that the mean average mark of student in the mothers education collage -6.119 less than to have good average mark of students as compared to students whose mothers education are illiterate.
- From coefficient table $\beta_{92} = -5.756$ shows that the mean average mark of student in parents way of giving motivation by enforce is -5.756 less than to have good average mark of students as compared to students whose parents way of giving motivation by advising.
- The value from coefficient table $\beta_{22} = -2.734$ shows that the mean average mark of student in mothers occupation merchant is -2.734 to have good average mark of students as compared to students whose mothers occupation farmer.

3.6. Checking Adequacy of Model

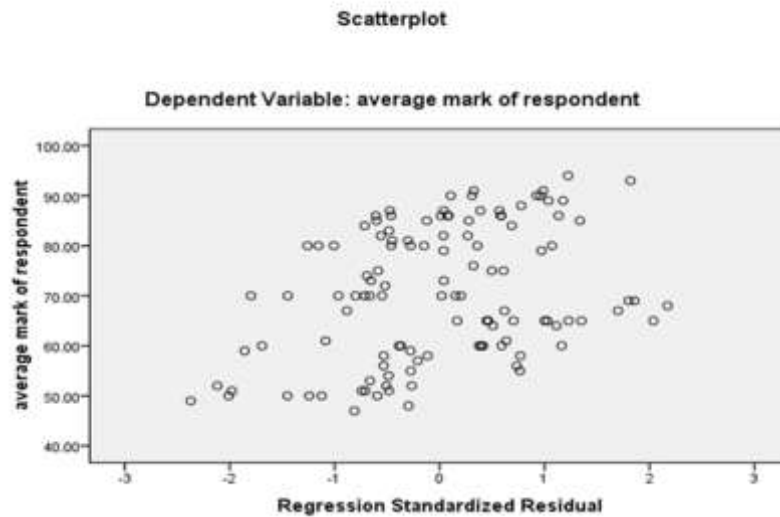
Normality Checking by Histogram: From the below figure the residual of the students average mark is normally distribution (dependent variable normally and independently distribution with mean $(-7.64 \times 10^{-15} \approx 0)$ and variance $(0.934 \approx 1)$ and it indicate residual approximately normally distributed with $\mu \sim (0, 1)$. so the normality is satisfied.



- **Normal probability plot:** A statistician, one can conclude that the model becomes normal. The plots of the ordered standardized residuals are approximately the same as the ordered normal scores. Under normality assumption, the plot indicates nearly straight line with an intercept of zero and a slope of one (these are the mean and standard deviation of residuals respectively). Generally, the linearity and normality assumptions are satisfied.



- **Checking Homoscedity:** The plot is random scatter of points (it is not in systematic pattern). This shows that the standardized residual are uncorrelated with the fitted value. Therefore, the plot is random or non-systematic pattern there is no Heteroscedasticity problem in the model.

Residuals Vs fitted values

- **Checking of Multicollinearity:** The decision is that absence of Multicollinearity based on variance inflation factor (VIF). Because of VIF are less than 10 for each predictor variables.

Model	Collinearity diagnostics	
	Tolerance	VIF
1 (Constant)		
Sex of respondent	.468	2.139
Age of respondent	.654	1.529
Student grade level	.903	1.108
Do you have parents	.708	1.412
Mothers education	.720	1.388
Fathers education	.561	1.783
Mothers occupation	.890	1.124
Fathers occupation	.736	1.359
Rate of money satisfy basic education materials	.284	3.518
Average income of family per month	.365	2.743
Family size	.251	3.985
Parents way of motivation their children	.405	2.468
Parents advice their children	.866	1.155
Parents follow up their children	.831	1.204
Have you leisure time	.509	1.963

Table 5. Collinearity Diagnostics

Conclusions

Based on the results of this study the following conclusions were drawn. Parents' (fathers' and mothers') income level, having parents, rate of money given to satisfy basic and educational materials, parents occupation, family size, parents educational level, and parents way of giving motivation have significant relationship with the academic achievement of students. However, with the implementation of the above variables; it is possible to increase the academic achievement of students more than other variables. According to the results of multiple regression analysis, the most important predictors of academic achievement of students were Parents' (fathers' and mothers') income level, having parents, rate of money given to satisfy basic and educational materials, parents occupation, family size, parents educational level, and parents way of giving. When academic achievement was regressed on the predictor variables, parents' income level, parents' education level, parents' occupational status, family size and other predictor variables the obtained multiple coefficient of determination was 0.879 (R^2). This

implies that the proportion of academic achievement variance accounted for by the independent variables, taken together, was 86.1%. The obtained multiple coefficients of determination indicates that there were over all relationship. F-test also revealed that this proportion of variance is statistically significant. From these findings, it was concluded that students' academic achievement in grade nine and ten was a function of parents' income, parents' education, parents' occupation, family size, and other variables. Hence, any intervention aimed at improving students' academic achievement need to consider these variables. Thus, the influence of role of parents on the academic achievement of students call for suitable intervention strategies on the part of teachers, counselors, school administrators, education officials and government at large.

Recommendations

After gathering the necessary data, analyzing, and interpreting it, the following recommendations were forwarded.

Parents' income (average income per month) is important to students' academic achievement; therefore, it is advisable for parents to improve their income level per month by involving in various different activities that help them generate additional income, to increase the rate of money given to basic and educational materials for students in academic achievement.

Since schools are the integral part of teachers, students and parents, parents should allocate time to visit schools and establish good relationship and discussion about their children's academic progress in according to way of motivation to learn actively in school.

In order to give students the necessary assistance, it is advisable for schools to have a well-organized students' record including the parent's income per month, educational level, occupation status ,family size and others that help them identify easily when support is available for academic achievement.

Finally, the study on the role parents' and students' academic achievement has covered only a limited area of Debre Birhan General School. Therefore, it is important to conduct a detailed study that will cover the schools and the population at large in different grade levels to arrive at general conclusions on the influence of parents on students' academic achievement.

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