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Original Research Article

ASSESSMENT AND DETERMINATE FACTORS OF STUDENT'S STUDY TIME PER DAY IN CASE OF TEPI PREPARATORY SCHOOL

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Abstract*:* This study was conducted on the regression analysis to assess the relationship between home environment and study time in case of Tepi preparatory school students. The purpose of this study was to identify the relationship home environment and study time of students. For these study 104 samples of students was selected by using cluster sampling method from the total number of 818 populations (students). The main source of data for this study was primary data, which is directly collected from the students through questionnaires. Multiple linear regression was used to analyze data. This finding showed that sex, number of academic books at home, and helping family at home has a significance effect on the study time of students.

Key words: Home environment, Mizan-Tepi, Regression

Introduction*:* The United Nations Report (2010) highlighted education as a basic right and need which is significant in the accomplishment of the second goal of the Millennium Development Goals. This is because good education academic performance guarantees skilled and dynamic citizen. This is because; academic performance is usually as a result of motivation that children get from the people they interact with in their initial stages of life [1].

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One of the most stable and consistently observed phenomena in the field of education is the impact of students' home background on achievement. Students whose parents have a higher level of education, a more prestigious occupation, or greater income tend to have higher achievement than students whose parents have a lower standing on such socio-economic status (SES) indicators [2]. Many theories have been proposed to account for this phenomenon, but there is little consensus about which explanation is the most powerful. One reason is that, in spite of the stability of the phenomenon there is also considerable variation in strength of effects across educational systems and learning domains [3]. So far there has been little research on this

variation, and on the mechanisms, which give rise to it.

A study conducted in the U.S.A revealed that years of schooling completed and educational achievement of students, varied widely by family backgrounds. Rouse and Barrow found out that students who came from less disadvantaged families had higher average test scores and were more likely to have never been held back a grade as compared to students from the more disadvantaged families. However, they highlighted that it was not clear to reflect the causal effect of family backgrounds on the child's educational achievement which creates a gap that this study sought to fill by finding out the influence of family backgrounds on the students' academic performance [3].

Researchers have not only found that adolescents from lower income and less-educated families performed less well in school, but those from single-parent and large families fared less well in school than their counterparts from higher income, better-educated, two-parent and small families [4& 5]. Other different study found that the educational level of parents explained more of the variability in school achievement than did other family demographic characteristics. This might be explained by the theory that caregivers with more 'human capital' had greater education and skills, which they could draw upon to teach their children cognitive and social skills and social and cultural norms [6,7 & 8].

The relationship of home environment and reading has often been of interest to researchers. According to [9] reading aloud to children was discovered to be the single most important activity for building a knowledge base for future success in reading. This study was investigated what extent parental education and gender influence preparatory students' achievement in reading time.

The purpose of this study was to investigate the relationship among home environment variables and reading time among students of Tepi preparatory school.

Objective of the study: To establish the relationship between home environment variables and reading time among Tepi preparatory school students. Specifically, the study sought to:

- To investigate the effect of home environment variables on reading time of students among Tepi preparatory school.
- To identify how strong are family environment variables at predicting reading time of students among Tepi preparatory school

Material and Methods

Study population and data source: The target population that we used in the study were the total numbers of all grade eleven & twelve students of Tepi secondary and preparatory school. The source of data was primary that is collected from the selected sample units of students by using self-administered questionnaire method. More over target population included all grade eleven (11) and twelve (12) students in Tepi preparatory school. The sampling frame was the list all grade eleven & twelve students in this particular school.

Sample size determination and selection: The population we are conducting the research is large enough. To study all these population at the same time is coasty and time consuming process even if it is good for the reliability and accuracy of the research .In order to minimize the cost and to save time that the research consumes we prefer to collect data using sample survey method, which is a method of collecting statistical data from sample elements to provide information that are relevant to all kinds of users at all levels.

In order to come up with adequate sample size which represents the whole population under the objective of the research, pilot-survey was conducted prior to the actual survey process. This method is preferable for determining the sample size for the study. Pilot survey is used to find the standard error of the population, which is used to calculate the sample size of the population under study, it also provides an information on how the population units are dispersed based on different factors.

Table 1: Pilot survey statistics

Response	N	Mean	S.D	Variance
Average point	10	2.2	0.207	0.043

To estimate the sample size we need the following assumption.

- Let Y_i be the average point of students with $\bar{y} = \frac{\sum_{i=1}^{n} y_i}{n}$
- $s^2 = \sum_{i=1}^{n} \frac{(y_i - \bar{y})^2}{n-1}$, so the sample size will be determined by the following formula:

$$n_0 = \frac{z_{a/2}^2 s^2}{d^2} * deff$$

where, s^2 =Variance of average point of sample students

z = 5% level of significance, set as 1.96

d = marginal error , set as 0.05 and

n = the required sample size.

Thus, $n_0 = \frac{z_{a/2}^2 s^2}{d^2} * deff = \frac{(1.96)^2}{(0.05)^2} * 0.043 * 1.8 = 119$

since n_0>0.05, n=104

luster Sampling is a process of any sampling plan that uses a frame consisting of clusters of listing units. For this study we use simple cluster sampling. Grade 11 as cluster 1 and grade 12 as cluster 2.

Probability Proportional to Size: The probability of selection into the survey sample for each cluster will be proportional to its relative size.

$$Probability\ selection\ (cluster\ k) = \frac{population\ in\ cluster\ k}{total\ population\ (all\ clusters)}, k = 1, 2, \ldots, 25$$

This is called probability proportional to size sampling (PPS sampling).

The populations and probabilities of selection of each PSU into the sample will be as follows:

Table 2: Populations and probability selection of district

Class	Population size	Probability of selection
Grade11	458	M1/N=PS1=0.56
Grade12	360	M2/N=PS2=0.44
Total (N)	818	

Then, from cluster 1 of 458 students we take 56% i.e. 58 students and from cluster 2 of 360 students we take 44% i.e. 46 students.

Variables considered in the study: The dependent variable was Study time that measured in hour. Similarly, different independent or explanatory variable was selected from different related study and literature in consideration of the current study area.

Statistical data analysis: The analysis is carried out in two sections. In the first section, results of descriptive statistics are presented; in the second section, we examined the effect of home and related characteristics on student study time using multiple linear regression with the help IBM SPSS statistics 20.

Results

Result of descriptive statistics: A total of 104 student attained preparatory school in Tepi preparatory school were included in the study. From the sampled student, the average study time of students was about 35.3%. similarly, 46.2% and 53.8% were male and female, respectively. The average age of student was about 18.33 years old. Indeed, the average mark of the sample students in the previous semester were 68.27.

Multiple Linear Regression Analysis

Model specification: Before we fit the linear regression model, first we check for linear functional form based on graphical displays of the dependent variable with each of the independent variables. The plots displayed in Figure 1 indicate that the relationship between the dependent and explanatory variables is nearly linear.

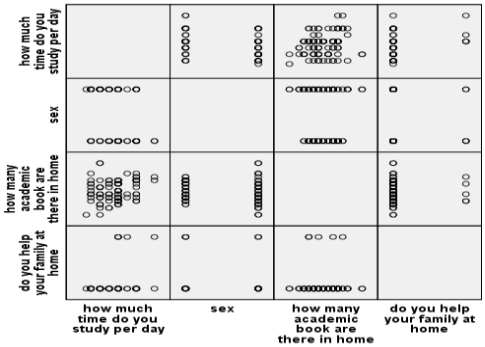

Figure1: relationship between the dependent and explanatory variables

Model diagnostic

a. Test of multicollinearity

Almost all of the correlation coefficients between the explanatory variables are small or moderate and statistically significant. To check whether these moderate correlations create the so-called Multicollinearity problem, a formal assessment is done using variance inflation factors and condition number of criteria.

In this assessment, first VIF is applied to detect Multicollinearity in the model. It has been noted that if any of the VIF is greater than 10, those variables are highly related to the other regressors

b. Testing the residuals for normality

As displayed in Figure 2 for the P-P plot, we observe that most of the actual data fall along the expected line. This indicates that there is no violation of the assumption of normality.

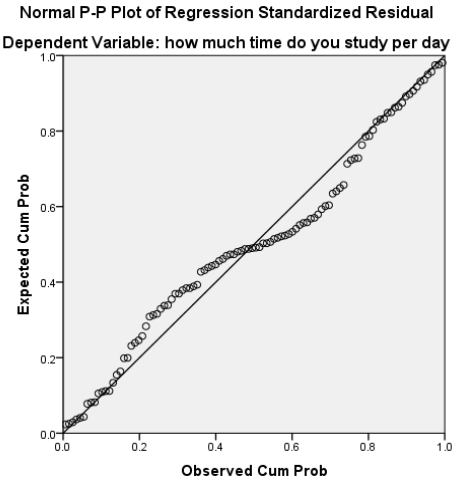

Figure 2: P-P plot

c. Testing the residuals for heteroskedasticity

Another assumption of ordinary least squares regression is that the variance of the residuals is homogeneous across levels of the predicted values, also known as homoscedasticity. If the model is well-fitted, there should be no pattern to the residuals plotted against the fitted values. If the variance of the residuals is non-constant then the residual variance is said to be "heteroscedastic."

A commonly used graphical method is to use the residual versus fitted plot to show the residuals versus fitted (predicted) values. Plots of residuals against time can be used to examine whether the variance of the error term is constant or not. As shown in Figure 3, the spread of the residual does not follow an increasing or decreasing pattern, thus we can say the residuals are homoscedastic (constant variance).

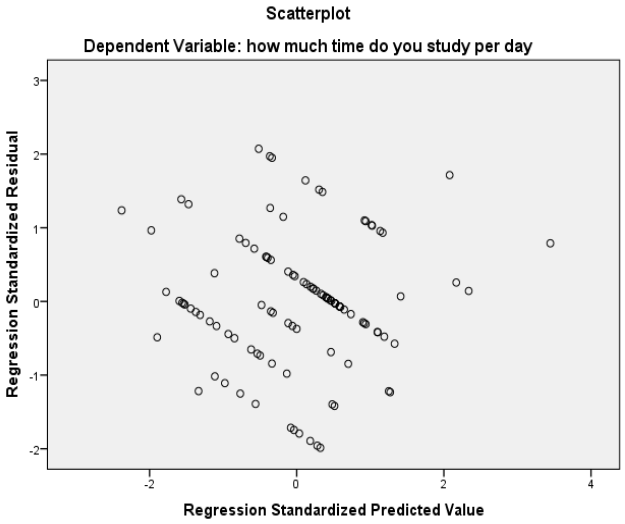

Figure 3

***d.* Checking for outliers**

From the plot of standardized residuals shown in Figure 3 there is no observation whose value of standardized residuals greater than 3.0 or less than -3.0, thus there is no problem of outlier.

Using Cook's d statistic there is no observation which is identified as possible influential observation since all Cook's d value less than 1. Therefore, all observation is retained in the data.

Table 3 Residuals Statistics

	Minimum	Maximum	Mean	Std. Deviation	N
Std. Residual	-1.987	2.073	.000	.903	104
Stud. Residual	-2.443	2.308	-.001	1.011	104
Cook's Distance	.000	.166	.014	.026	104
Centered Leverage Value	.067	.641	.183	.085	104

e. Testing the residuals for autocorrelation

One can use the Durbin-Watson d test, to test for first-order autocorrelation, that is

H0: $\rho=0$; H1: $\rho\neq0$ at $\alpha = 0.05$

Note that under the null, the errors at t-1 and t are independent or the observations are not serially dependent. The Durbin-Watson d statistic is obtained as 1.806.

From the results in Table 4 below using SPSS multiple linear regression models in stepwise selection method it can be seen that variable students sex, number of academic book at home and helping family at home are highly significant ($p < 0.05$), but age of the student, marital status of the student, grade, average mark of the student in the previous semester, residence, number of room in home, time it takes from school to home, study at home, study place, number of family members, time spent on helping family, average income of family, number of time eat per day, having own class to study, mother educational level and father educational level are not significant and remove from the model. The adjusted R^2 is high and F-value indicates that the multiple linear regression model is significant.

Table 4: Results of Multiple Linear Regression Models

model	Unstandardized coefficients		Standardized coefficients	t	Sig.
	B	Sd. Error	Beta		
(Constant)	5.558	2.204		2.255	.014*
Student's sex (Male)	-1.381	.322	-.428	-4.288	.000*
Number of books at home	.116	.051	.213	2.274	.025*
Helping family at home (yes)	2.262	.757	.301	2.989	.004*
F	**2.479**				.002*
R^2	**.359**				
R^2 Adjusted	**.214**				
D.W	1.806				

*, significance at 5% level of significance

The result of linear regression presented in Table 4 given above showed that the relationship between study time and home environment was highly significant for number of academic books at home. Number of academic books was increased by about 0.116 for each unit increase in Study time per day in hour controlling all the other variables in the model.

Student sex is also a significant factor associated with home environment and study time of students. As compared to the reference category (female), male students were about 1.381 lower in their study time, controlling for other variables in the model. Helping family at home is another important variable which showed a statistically significant association with student's study time and home environment. The students who help their family at home were higher by 2.262 units than those students who does not help their family at home, controlling for other variables in the model.

Discussion of the result: The results of the analysis presented in this study was to identify factors that are significantly associated with the relationship between home environment and study time. This paper was important to improve the study time of students by ensuring the effective implementation of a limited number of significant factors. This study was an attempt to identify some relationship between home environment and study time based on the data collected from May - June, 2017 on Tepi preparatory school.

The analysis also showed that student's sex was important variable which showed a statistically significant association with the relationship between home environment and study time in this research paper. But another study on reading achievement show that sex was not a significant

predictor of reading achievement, (β = 0.03, *p* = 0.13). This result was found that reading achievement is not influenced by the sex of students in Zimbabwe [10].

This study revealed that number of academic books at home is also a significant factor associated with home environment and study time of students. Unlike that a study on emergent literacy showed that the contribution of certain individual predictors like books at home was surprisingly low. This study explains in his study one would think that the number of books at home would be a significant predictor of reading achievement. Probably part of the reason for the weak contribution of number of books is the way the data were collected. Students were not specifically asked for the number of 'reading books', but the number of books in general. So, there is a possibility that students merely indicated any books they had at home even those they would never read. So, we viewed this as a limitation of the study. But in our study the question was asked clearly and specifically [11].

In this study helping family at home also showed a statistically significant association with home environment and study time. The students who help their family at home were higher by 2.262 units than those students who does not help their family at home, controlling for other variables in the model.

Conclusion and Recommendation: This study was designed to identify the relationship between home environment and study time based on the data collected from April-May, 2017 on Tepi preparatory school. Multiple linear regression was used.

The results of multiple linear regression showed that variables like number of academic books at home and helping family at home had positive effects on the relationship between home environment and study time.

The findings from this study have some relevant policy implications

- Improve the female students' performance by arranging tutorial and other supportive programs to fill the gap that they cannot study more time as compared with male students.
- The government should create awareness for parents to keep support their children by minimizing their hour spent on helping family.
- It is advisable for families to bought more academic books in order to increase their children study time.
- More research needs to be carried out in this particular study area on the factors associated with relationship between home environment and study time since there is no another research carried out by someone else.

Reference

1. United Nation (2010), Human right and the millennium Development Goal (MDG) in practice: A review of country strategies and reporting
2. Chiu, M., and Khoo, L. (2005). Effects of resources, inequality, and privilege bias on achievement: Country, school, and student level analysis. American Educational Research
3. Barone, C. (2006). Cultural capital, ambition and the explanation of inequalities in learning outcomes: a comparative analysis. Sociology, 40(6), 1039–1058.
4. McGill-Franzen, A., & Allington, R. (1991). Every child's right: Literacy. The Reading Teacher, 45, 86-90.
5. Sputa, C. L., and Paulson, S. E. (1995). Birth order and family size; Influences on adolescents' achievement and related parenting behaviors. Psychological Reports, 76, 43-51.
6. Ochs, E., Taylor, C., Rudolph, D., and Smith, R. (1992). Storytelling as a theory-building activity. Discourse Processes, 15, 32-72.
7. Snow, C. E., Perlmann, R., Berko Gleason, J., and Hooshyar, N. (1990). Developmental perspectives on politeness: Sources of children's knowledge. Journal of Pragmatics, 14, 289-305.
8. Swick, K. J., and Broadway, F. (1997). Parental efficacy and successful parent

involvement. Journal of Instructional Psychology, 24, 69-75.
9. Anderson, R. C., Scott, J. A., & Wilkerson, I. (1985). Becoming a nation of readers: The report of the commission on reading. Washington, DC: National Academy of Education.
10. Gibbs Y. kanyongo , Janine Certo and Brown I . Launcelot. (2006). using regression analysis to establish the relationship between home environment and reading achievement.
11. Saracho, O. N. (1997b). Using the home environment to support emergent literacy. Early Child Development and Care, 201-216.