



The Impact of Students “Socio-economic Condition on Academic Performance in Public and National University of Bangladesh”

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Authors' contributions

This work was carried out in collaboration between all authors. Author MMH designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Author MJ managed the analyses of the study. Authors BB and MKH managed the literature searches. All authors read and approved the final manuscript.

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Abstract

This study is about the impact of students' socio-economic condition on academic performance in public and national universities. The objectives of the study are to evaluate the factors that influenced the student academic performance and the relationship between the student socio-economic background and academic performance. The results revealed that the student social economic condition influenced student academic performance. The academic performance focuses on statistical significance that stratifies the monthly educational expenditure, the time spend in study per day and working except study. The result of SSC and HSC examination are the reasonable factors influencing the academic performance of the examination in university.

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1 Introduction

Human life, which is the best creation of God, has two aspects: The biological and sociological or culture, while the former is maintaining by food and reproduction, the latter is preserved and transmitted by education. It is through education that child promotes his intelligence and adds his knowledge with which he can move his world for good and for evil according to his own wishes. Education, in fact, one of the major “life process” of the human beings. Just as there are certain indispensable vital processes of life in a biological sense. So education may be considering a vital process in social science [1].

Academic achievement undertakes primary importance in the context of an education system aimed at the progressive achievement of the students. The education of a man is monitored on the basis of his academic achievement. Academic achievement is the core of the wider term that is educational growth [2,3]. In Bangladesh, the opportunity of higher education is not sufficient with respect to the number of students. After passing Higher Secondary School Certificate examination a students has to enter a university. A student has to complete in the battle admission test to enter into a public university. On the other hand, a student with a level a merit and fitness can enter into national university. But rich students can easily study in private university. The students of the family of the higher society admit into private university. So the socio- economic condition is an important factor in studying in public and national university.

2 Literature Review

Socio-economic condition is a term comprises of two variables: the social condition and economic condition. Social condition is acquired by social position and economic condition is associated with the money or economy a person has. The Socio-economic condition was measured with same indicators by different sociologists, educationists and psychologists [4]. According to Parson, Stephanie and Deborah (2001), “Socioeconomic Status (SES) is the term used to distinguish between people’s relative position in the society in terms of family income, political power, educational background and occupational prestige” [5]. After ten years the SES was defined by Saifi and Mehmood (2011) as “Socio-economic condition is a combined measure of an individual or family’s economic and social position relative to others based on income, education and occupation” [4].

Mirza [6] conducted a research study to find out the relationship of socio-economic condition and student’s achievement and found that has fairly significant effect on their achievement. Khan and Shah [7] also conducted a research study on factors associated with learning achievement of grade point average students in public university. Graetz suggested “A student educational success contingent heavily on social status of student’s parents/ guardians in the society. Considine and Zappala [8] noticed the same that parent’s income or social status positively affects the student test score in examination. According to Minnesota [9] “the higher education performance is depending upon the academic performance of graduate students. Durden and Ellis quoted Staffolani and Bratti, (2002) observed that “the measurement of students previous educational outcomes are the most important indicators of students future achievement, this refers that as the higher previous appearance, better the student’s academic performance in future endeavors [10]. Family background and its socioeconomic status is a key to a student life and outside [6]. The environment at home is a primary socialization agent and influences a man’s interest and aspirations for the future. A family’s socioeconomic status is based on family income, parental education level, parents occupation level and social status in the community such as contacts with the community, group association and the community’s perception of the family, Demarest, Reisners, Anderson, Humphry, Farquhar and Stein [11].

Woessmann [12] concludes in his study that family background has strong and similar effects on both Europe and the USA. He also estimates the model using a QR approach where he concludes that there is weak evidence of variation in the family background influence.

Most of the citizens of the Bangladesh have to complete their education through the university. There are evident differences between public and national universities in many respects. The campus life of the students of these two types of universities is quite different. The students of public university can enjoy a well decorated campus life than the students of the national university. There is also dissimilarity in evaluation system of the students' academic performance in these universities. The teaching style of teachers is different. The students of national university have to suffer from session jam more than public university. Similarly, the life expectation of the students of these universities also varies. As the socio-economic conditions of studying in the universities: public & national are a great factor. Its study becomes important. For the analysis of the condition of the verities and verity students, the comparison of the socio-economic condition between public and national universities is badly needed.

The study is bending for the analysis as well as the comparison of the public and national universities and their students socially and economically. It focuses on the student's family background, family status, campus life, studying procedure, expectation goals etc. The study will be precise by its successful accomplishment.

Social and economic variation is a great problem which is evident everywhere in our society. It is also present in case of the students of public and national universities. Many students cannot get chance to study in public university using to merit and many students cannot get study in public university because of financial disability. For this reason a merit students admit into national university. So not only the merit and money but also some other social factors effects on studying in public or national university. Even in varsity life, the students' life style, study style, academic performance, expectation etc. vary in these two types of universities although they are taking the degree of same level. So, it is needed to analyze the condition of the students of public and national university in both social and economic prospects.

3 Methodology

3.1 Introduction

In this study a linear model of public and national university student performance was designed. The result of the examination in the university(REU) was taken as a dependent variable and the monthly educational expenditure (MEE), the time spend in the study per day (TTS), the work except study (WES), the result of SSC examination (RSSC) and the result of HSC examination (RHSC)as an independent variables. The population of the study consists of the students of public university and national university.

3.2 Sample size determination

Owing to the limitation of time and money and others restriction, a sample is drowning from the population as its representative part. But size of the sample should be precise and adequate. To make the study worthy and accurate, it has been decided that the percentage of the population to be included in the study is 0.89 and the level of significance is 0.05. We know, The sample size, $N = \frac{z^2 pq}{d^2}$ [13].

Here, The level of significance, $d=0.05$; The present of the population to be include in the sample, $p=0.89$; $q=1-p=1-0.89=0.11$; The level of standard normal variant at 5% level of significance, $z=1.96$.

Now, $N = \frac{(1.96)^2 \times 0.89 \times (1-0.89)}{(0.05)^2} = 150.44 \approx 150$; Thus, the estimated sample size is 150.

3.3 Sampling technique

Then 150 students are randomly selected from public university (Bangabandhu Sheikh Mujibur Rahman Science and Technology University, Gopalganj) and national university (Govt. Bangabandhu College, Gopalganj and Govt. Devandra College, Manikganj). Where 75 students take from public university (Bangabandhu Sheikh Mujibur Rahman Science and Technology University) and 75 students take from national university (Govt. Bangabandhu College and Govt. Devandra College, Manikganj).

3.4 Distribution of sampled students

The distribution of the sampled students is furnished as below:

Table 1. Students of Public University and National University

		Number of students		Total
		Public University	National University	
Faculties	Science	44	44	88
	Arts	15	15	30
	Commerce	15	15	30
	Others	1	1	2
	Total	75	75	150

Simple random sampling technique was employed in the selecting the sample from the targeted population. The researcher personally went to the respondents and filled out the questionnaires so that the true responses could be obtained. The researcher use close ended questionnaires because the population is literate and large and time for collecting data is limited. Data from Questionnaires was compiled, sorted, edited, classified and coded into the coding sheet of SPSS 13.0 (version) and Microsoft Excel 2007 [14,15].

3.5 Test of equality of the two means and variance

To test whether the two means (μ_1, μ_2) are equal or not, the hypothesis is set up as:

$$H_o: \mu_1 = \mu_2$$

$$H_I: \mu_1 \neq \mu_2$$

The appropriate test statistics is which follows normal distribution under null hypothesis.

$$d = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

To test whether the two variances (σ_1^2, σ_2^2) are equal or not, the hypothesis is set up as:

$$H_o: \sigma_1^2 = \sigma_2^2$$

$$H_I: \sigma_1^2 \neq \sigma_2^2$$

The appropriate test statistic is

$$F_{v_1, v_2} = \frac{S_1^2}{S_2^2}$$

The appropriate test statistic is which follows F distribution with v_1 and v_2 and degrees of freedom under null hypothesis. Since $F_{\text{tab}} < F_{\text{cal}}$, we reject the null hypothesis at 5% level of significance. It implies that the variances are not equal [14,15,13].

3.6 Multiple regression analysis

Multiple regression analysis is employed to identify the factors that influence the expenditure of our study area.

Multiple regression analysis permits the measurement of the degree of relationship between a dependent variable and two or more independent variables considered simultaneously.

Let us consider the multiple regression equation as

$$Y_i = \beta_1 + \beta_2 X_{2i} + \beta_3 X_{3i} + u_i \quad (1)$$

Under the assumption of the classical regression model, it follows that, on talking the conditional expectation of Y on the both sides of (1), we obtain

$$E(Y_i | X_{2i}, X_{3i}) = \beta_1 + \beta_2 X_{2i} + \beta_3 X_{3i} \quad (2)$$

In words, (2) gives the conditional mean or expected value of Y conditional upon the given or fixed values of X_2 and X_3 . Therefore, as in the two variable case, multiple regression analysis is regression analysis conditional upon the fixed values of the regressors, and we obtain the average or mean value of Y or the mean response of Y for the given values of the regressors.

The regression functions to fit the linear regression. For correlation analysis the correlation function built in Microsoft Excel 2007. For testing the hypothesis that the result of the examination in the university (REU) students of the public and national university using built in F-test function in SPSS. Graphs are constructed using Microsoft Excel 2007 graphical functions [16,17,18,19,20].

4 Discussion

4.1 Introduction

The socio-economic variation exists everywhere in the society. The university students have their own distinct socio-economic condition. The determinants of socio economic condition on education are the monthly educational expenditure, the residential place, using library, the time spend in daily study, doing works excepts study, results of SSC, HSC and the university examination and the future life expectation after finishing education.

4.2 Education of parents

The students' socio-economic condition mostly depends on their parent's education. So the educational qualification of the parents of the students is an important factor of the study. The parents are mostly instructors for their sons and daughters studying in public or national universities and in this case their educational view and history become important factor. The parent's education level is classified into the categories of illiterate, primary, secondary, higher secondary, graduate, higher degree. The education level of fathers and mothers is separately Table 2.

Table 2. Father's and mother's education & university status

		Father's education			Mother's education		
		University status		Total	University status		Total
		Public	National		Public	National	
Father's and Mother's Education	Illiterate	9.3%	14.7%	12.0%	14.7%	29.3%	22.0%
	Primary	8.0%	33.3%	20.65%	17.3.7%	30.7%	24.0%
	Secondary	30.7%	28.0%	29.35%	41.3%	24.0%	32.65%
	Higher Secondary	17.3%	10.7%	14.0%	17.3%	13.3%	15.3%
	Graduate	32.0%	13.3%	22.65%	9.3%	2.7%	6.0%
	Higher Degree	2.7%	0.0%	1.35%	0.0%	0.0%	0.0%
	Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

From the Table 2, it is found that 22.65% of the fathers of university students are graduated and 12.0% of them are illiterate. 32.0% of the fathers of public university students are graduated whereas 13.3% of the fathers of national university students are graduated. 9.3% of the fathers of public university students are illiterate whereas 14.7% of the fathers of the students studying in national university are illiterate. On the other hand, it is found that 32.65% of the mothers of university students have secondary education level and 22.0% of them are illiterate. 41.3% of the mothers of public university students are secondary education level whereas 24.0% of the mothers of national university students are same education level. 14.7% of the mothers of public university students are illiterate whereas 29.3% of the mothers of national university students are illiterate.

4.3 Occupation of parents

The parent's occupations are most important to the socio-economic condition of their sons and daughters studying in university. The students can study in public or national universities on the basis of their parent's occupations. The parent's occupations are classified into the different categories. The occupation pattern of fathers and mothers is separately below:

Table 3. Father's and mother's occupation & university status

		Father's occupation			Mother's occupation		
		University status		Total	University status		Total
		Public	National		Public	National	
Father's and Mother's Occupation	Govt. Service	20.0%	16%	18.0%	2.7%	2.7%	2.7%
	Non-Govt. Service	6.7%	5.3%	6.0%	1.3%	2.7%	2.0%
	Business	24.0%	9.3%	16.65%	0.0%	0.0%	0.0%
	Teacher	16.0%	4.0%	10.0%	5.3%	1.3%	3.3%
	Doctor	1.3%	0.0%	0.65%	0.0%	0.0%	0.0%
	Engineer	1.3%	0.0%	0.65%	0.0%	0.0%	0.0%
	House Wife	0.0%	0.0%	0.0%	90.7%	93.3%	92.0%
	Farmer	26.7%	62.7%	44.7%	0.0%	0.0%	0.0%
	Others	4.0%	2.7%	3.35%	0.0%	0.0%	0.0%
	Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

From the Table 3, it is found that most of the fathers in case of public and national university students are farmer. 26.7% of the fathers of public university students are farmer where as 62.7% of the fathers of national university are of same occupation. 20.0% of the fathers of public university the students are government service whereas 16.0% of the fathers of national university are of same occupation. 1.3% of the fathers of public university students are doctor and engineer whereas 0.0% of those in case of national university are of same occupation. 24.0% fathers of the students of public university are businessmen

whereas only 9.3% fathers of the students of national university are businessmen. On the other hand, it is shown that most of the mothers of the students of both universities are house-wife. 90.7% mothers of the students of public university are house-wife whereas 93.3% mothers of the students of national university are house-wife. 5.3% mothers of the students of public university are teacher whereas 1.3% mothers of the students of national university are of the same occupation. The number of the govt. service of the mothers of the students of both universities is same.

4.4 Family income and expenditure

The economic condition of a family highly maintains the socio-economic condition of family members. So the family income and expenditure are an important factor to the socio-economic condition of the students. The income and expenditure distribution of the families of the students studying in public and national university is shown below:

Table 4. Monthly family income and expenditure of public versus National University students

	Monthly family income			Monthly family expenditure		
	University status		Total	University status		Total
	Public	National		Public	National	
3000-12000	21.3%	36.0%	28.65%	2000-7000	50.7%	56.0%
12000-16000	22.7%	28.0%	25.35%	7000-10000	25.3%	34.7%
16000-20000	17.3%	17.3%	17.3%	10000-13000	12.0%	6.7%
20000-above	38.7%	18.7%	28.7%	13000-above	12.0%	2.7%
Total	100.0%	100.0%	100.0%		100.0%	100.0%

The Table 4 show that most of the families (38.7%) of the students studying in public university have the monthly income interval of tk. 20000 to tk. above while most of the families (36.0%) of the students studying in national ones have the monthly income interval of tk. 3000 to tk. 12000. The students studying in public and national university have the monthly income tk.16000 to tk.20000 (17.3%).

The Table 4 show that most of the families (50.7%) of the students studying in public university have the monthly expenditure interval of tk. 2000 to tk. 7000 while most of the families (56.0%) of the students studying in national university have the same monthly expenditure. (12.0%) of the students studying in public university have the monthly expenditure intervals of tk. 13000 to above whereas (2.7%) of the students studying in national university has the same monthly expenditure.

4.4.1 Equality of the averages and variances of monthly family income and expenditure of the students of public and National Universities

The averages and variances of monthly family income of the students of public and national university are represented in the following table:

Table 5. Averages and variances of monthly family income of the students of Public and National University

University status	Monthly family income				Monthly family expenditure			
	Mean	Variance	Test statistics		Mean	Variance	Test statistics	
			d _{cal}	F _{cal}			d _{cal}	F _{cal}
Public	1.99E4	9.292E7	3.82	2.02	7860.00	1.037E7	2.4985	1.534
National	1.47E4	4.608E7			6666.67	6.739E6		

The Table 5 expresses that averages of monthly family incomes of the students of public and national universities are tk. 1.99E4 and tk. 1.47E4 respectively and variances are tk. 9.292E7 and tk. 4.608E7

respectively. From sample, the value of the statistic is $d_{cal} = 3.82$. At 5% level of significance, the tabulated value of standard normal variate for two tails test is

$d_{tab} = 1.96$. Since $d_{tab} < d_{cal}$, we reject the null hypothesis at 5% level of significance. It implies that the average monthly family incomes of the students of national and public universities are not equal.

On the other hand, it is found that averages of monthly family expenditures of the students of public and national universities are tk. 7860.00 and tk. 6666.67 respectively and variances are tk. 1.037E7 and tk. 6.739E6 respectively. From sample, the value of the statistic is $F_{cal} = 1.534$. At 5% level of significance, the tabulated value of the variate for two tails test is

$F_{5\%, 74, 74} = 1.24$. Since $F_{tab} < F_{cal}$, we reject the null hypothesis at 5% level of significance. It implies that the variances of the monthly family expenditures of the students of public and national universities are not equal.

4.5 Students' monthly educational expenditure

Education is barely without expenses. The students have to spend money for residing, paying tuition fee and many other study purposes. The educational expenditure of the students of public and national universities mainly varies in educational goods, tuition fee etc. The monthly educational expenditure of the students of public and national universities is represented in the following table:

Table 6. Monthly educational expenditure of Public versus National University students

		University status		Total
		Public	National	
Monthly Educational Expenditure	200-1000	12.0%	70.7%	41.35%
	1000-2000	66.7%	26.0%	46.7%
	2000-3000	20.0%	2.7%	11.35%
	3000-above	1.3%	0.0%	0.65%
Total		100.0%	100.0%	100.0%

From Table 6, it is found that 66.7% of the students of public university spend tk. 1000 to tk. 2000 on educational purpose whereas 26% of the students of national university spend tk. 1000 to tk. 2000 on this purpose. 12.0% of the students of public university spend tk. 200 to tk. 1000 on educational purpose whereas 70.7% of the students of national university spend tk. 1000 to tk. 2000 on this purpose. No student of national university spends money tk. 3000 to above per month whereas 1.3% of the student of public university spends money tk. 3000 to above per month for this purpose.

4.5.1 Equality of the averages and variances of monthly educational expenditure of the students of Public and National Universities

The averages and variances of monthly educational expenditure of the students of public and national universities are represented in the Table 7.

The Table 7 shows that average of monthly educational expenditures of the students of public and national universities are tk. 1731.33 and tk. 1032.00 respectively and variances are tk. 1.608E5 and tk. 1.084E5 respectively, the value of the statistic is $d_{cal} = 12.173$. At 5% level of significance, the tabulated

value of standard normal variate for two tails test is $d_{tab} = 1.96$. Since $d_{tab} < |d_{cal}|$, we reject the null hypothesis at 5% level of significance. It implies that the average monthly educational expenditures of the students of public and national universities vary significantly. From sample, the value of the statistic is $F_{cal} = 1.4834$. At 5% level of significance, the tabulated value of the variate for two tails test is $F_{5\%, 74, 74} = 1.24$.

Table 7. Averages and variances of monthly educational expenditure of the students of Public and National Universities

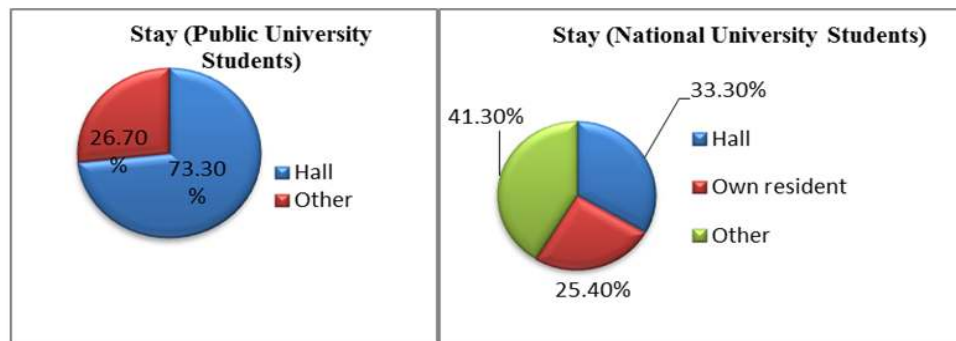
University status	Monthly educational expenditure			
	Mean	Variance	Test statistics	
			d_{cal}	F_{cal}
Public	1731.33	1.608E5	12.173	1.4834
National	1032.00	1.084E5		

Since $F_{tab} < F_{cal}$, we reject the null hypothesis at 5% level of significance. It implies that the variances of the monthly educational expenditures of the students of public and national universities are not equal.

4.6 Student's residential place

The residential place is an important factor to the socio-economic condition of the varsity students. It has a great impact on their education and other social facts.

The distribution of the residential places of the students studying in public and national universities is furnished in the figure below:



Figs. 1 and 2. Residential place of the students of Public University and National University

From Figs. 1 and 2, it is found that most of the students of public university (73.3%) stay in hall. On the other hand 33.3% of the students of national university stay in hall. 26.7% of the students of public university stay in other place whereas most of the students of national university stay in other place.

4.7 Student's using university library

The university library is a center where the students can acquire knowledge. It impacts on the students' education. A student who uses the varsity library regularly can perform well in the examination. So university library is a great factor to the students' socio- economic condition.

The student's using university library is shown in the following two pie charts with respect to the university status:

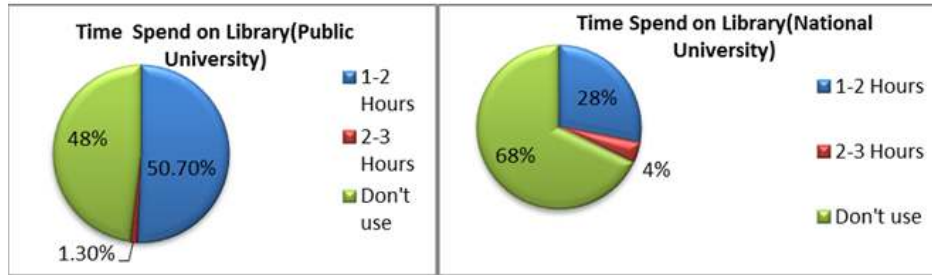


Fig. 3. The using of the University Library by the students of Public and National University

From Fig. 3, it is found that 50.7% of the students of public university use the university library whereas 28.0% of the students of national university use the university library. 48.0% of the students of public university don't use the university library whereas most of the students of national university don't use the university library.

4.8 The time spent in daily study by the students of Public and National University

The students' performing good result as well as acquiring much knowledge is dependent on how much time they spend in the daily study. The more time a student studies the more he can learn and perform.

The average spending time in different places in daily study of the students of Public and National Universities is shown in the table and graph as follows:

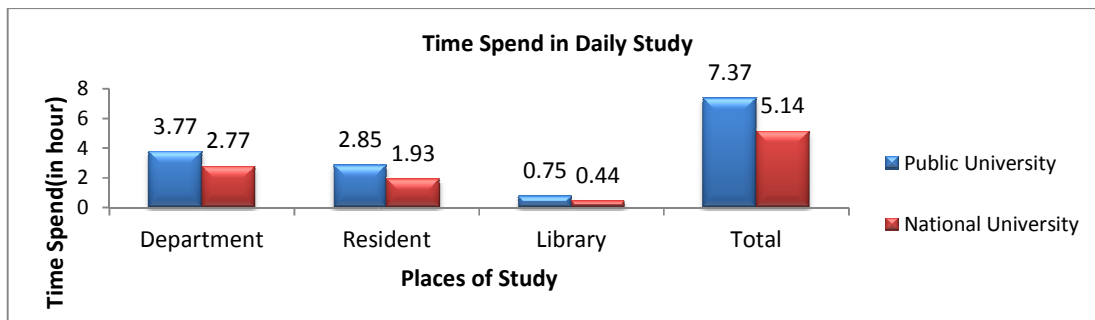


Fig. 4. The average spending time in different places in daily study of the students of Public and National Universities

From Fig. 4, it is found that the students of public university study 3.77 hours in department, 2.85 hours in resident, 0.75 hours and 7.37 hours in total daily on average. On the other hand those of national university study 2.77 hours in department, 1.93 hours in resident, 0.44 hours and 5.14 hours in total daily on average.

4.9 The involvement of the students of public and national universities in any work except study

The students of universities are more or less involved in works except study. The works which they usually do are tuition, part time job etc. The reasons for which some of the students do not involve themselves in other works because of not available, for good result etc.

The involvement of the students of public and national universities in any work except study is shown in the following two pie charts:

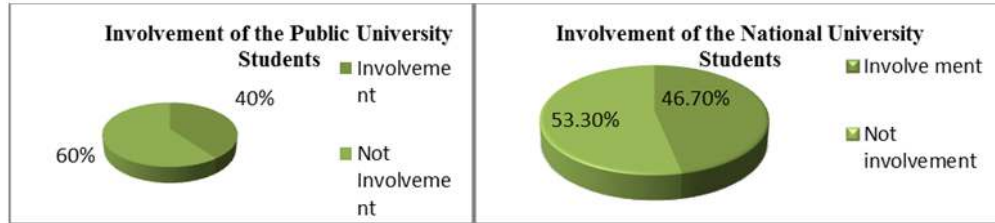


Fig. 5. The involvement of the Students of Public and National University in any work except study

The Fig. 5 represent that 40.0% of students of public university are involved in any work as well as study whereas 46.7% of those of national university are involved such.

4.10 The students preferable professions after the completion of education

The university students are usually worthy as well as ambitious of a good profession after the successful completion of their long education life. In preferring the profession, the social view of the student can be estimated and hence this fact is emergent to the analysis.

The Students' preferable professions after the successful completion of their study are mentioned in the following figure:

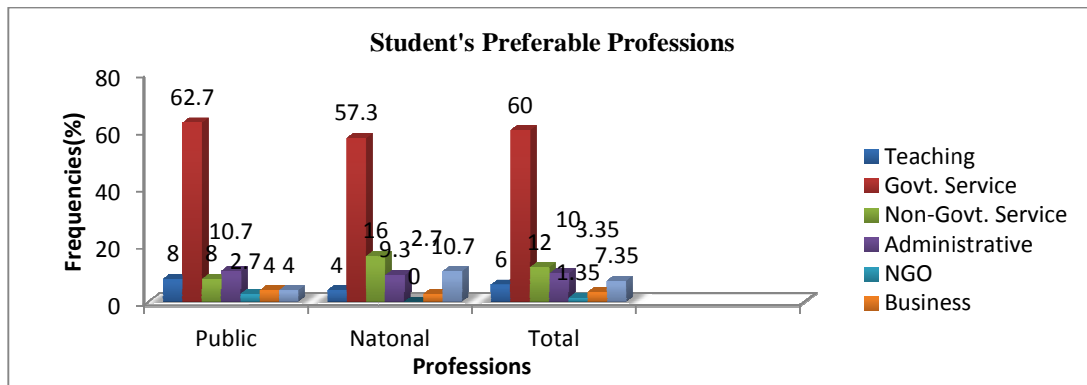


Fig. 6. The student's preferable professions after the completion of Education University

From the Fig. 6, it is found that most of the student's public university and national university want to be government service holder. 62.7% and 57.3% of the public university and national students respectively have the desire of having government service holder. 8.0% of the public university students of are ambitious of having non-government service holder while 16.0% of the national university students of are ambitious of having this job.

4.11 Model selection

To estimate a best model for the dependency of some variables on the result of the examinations of university is an important purpose of the study. In the study, the result of the examinations in university (REU) is the dependent variable and the monthly educational expenditure (MEE), the time spent in study per

day (TTS), the work except study (WES), the result of SSC examination (RSSC) and the result of HSC examination (RHSC) are the explanatory variables. SPSS and EXCEL are used to select the best model.

Some model selection criteria like R^2 , Adjusted- R^2 (\bar{R}^2), AIC (Akaike Information Criteria), SIC (Schwarz Information Criterion) are used to find the best model among the following five models:

$$\text{Model i: } REU = \beta_0 + \beta_1 MEE + U$$

$$\text{Model ii: } REU = \beta_0 + \beta_1 MEE + \beta_2 TTS + U$$

$$\text{Model iii: } REU = \beta_0 + \beta_1 MEE + \beta_2 TSS + \beta_3 WES + U$$

$$\text{Model iv: } REU = \beta_0 + \beta_1 MEE + \beta_2 TSS + \beta_3 WES + \beta_4 RSSC + U$$

$$\text{Model v: } REU = \beta_0 + \beta_1 MEE + \beta_2 TSS + \beta_3 WES + \beta_4 RSSC + \beta_5 RHSC + U$$

Where, REU = Result of the examinations in university, MEE = Monthly educational expenditure, TSS = Time spent in study per day, WES = Work except study, RSSC = Result of SSC examination, RHSC = Result of HSC examination,

U = Random error component, $\beta_0, \beta_1, \beta_2, \beta_3, \beta_4$ and β_5 are the parameters of the model.

For the both types of universities the selected model is

$$\text{Model v: } REU = \beta_0 + \beta_1 MEE + \beta_2 TSS + \beta_3 WES + \beta_4 RSSC + \beta_5 RHSC + U$$

The values of the model selection criteria for the five models in case of public university are given in the following table:

Table 8. The model selection criteria for the Models for Public and National University

Model	Public University				National University			
	R^2	Adjusted R^2	AIC	SIC	R^2	Adjusted R^2	AIC	SIC
1	0.174	0.162	37.23709	39.36419	0.133	0.123	17.14551	18.12492
2	0.211	0.189	34.27180	37.24992	0.195	0.172	17.23638	18.73418
3	0.259	0.228	34.31328	38.34542	0.195	0.161	17.13337	19.14671
4	0.309	0.270	34.74963	39.92678	0.208	0.163	16.21603	18.63196
5	0.383	0.339	34.15950	37.15416	0.239	0.186	16.14998	18.03998

From the Table 8, it is found that the five model is the best model since the value of \bar{R}^2 is largest and AIC, SIC are minimum. We also see that the value of \bar{R}^2 are slightly differ in the above four models. In this view, to avoid the multicollinearity problem the five models is selected as the best one. Since the values of R^2 and adjusted- R^2 (\bar{R}^2) are very small the significance test of the parameters of the selected model is needed to find whether these R^2 and \bar{R}^2 values are statistically significant or not. On the other hand, it is found that the five model is the best model since the value of \bar{R}^2 is largest and AIC, SIC are minimum. We also see that the value of \bar{R}^2 are slightly differ in the above four models. In this view, to avoid the multicollinearity problem the five models are selected as the best one. Since the values of R^2 , adjusted- R^2 (\bar{R}^2) are very small and AIC, SIC are high the significance test of the parameters of the selected model is needed to find whether these R^2 , adjusted- R^2 (\bar{R}^2) and AIC, SIC values are statistically significant or not.

4.12 Multiple regression analysis of the model for Public and National University

The parameters of the above model are estimated by applying the SPSS computer package program as follows:

Table 9. The estimated coefficients for the model for Public and National University

University status			
Public		National	
Regressors	Coefficients	Regressors	Coefficients
Constant	$\beta_0 = 38.824$	Constant	$\beta_0 = 33.758$
MEE	$\beta_1 = 0.001$	MEE	$\beta_1 = 0.258$
TSS	$\beta_2 = 0.044$	TSS	$\beta_2 = 0.116$
WES	$\beta_3 = 1.07$	WES	$\beta_3 = -0.001$
RSSC	$\beta_4 = 0.147$	RSSC	$\beta_4 = 0.05$
RHSC	$\beta_5 = 0.191$	RHSC	$\beta_5 = 0.122$

Hence the fitted regression model for public and National university becomes as:

$$\text{Model: REU} = 38.824 + 0.0001\text{MEE} + 0.044\text{TSS} + 1.07\text{WES} + 0.147\text{RSSC} + 0.191\text{RHSC}$$

and

$$\text{Model: REU} = 33.785 + 0.258\text{MEE} + 0.116\text{TSS} - .001\text{WES} + .005\text{RSSC} + 0.122\text{RHSC}$$

From the above analysis for public university, the monthly expenditure, time spent in study per day, working except study, the result of SSC examination and the result of HSC examination positively affect their result of the examinations in university. On the other hand for national university from the above analysis, the monthly educational expenditure, the time spent in study per day, the result of SSC examination and the result of HSC examination and positively affect their result of the examinations in university but working except study negatively affect this result.

The value of the statistic can be calculated for public and national university from the following ANOVA table at 5% level of significance for two tail test:

Table 10. ANOVA table

University status										
	Public					National				
	Sum of squares	df	Mean square	F	Sig.	Sum of squares	df	Mean square	F	Sig.
Regression	1178.411	5	182.288			277.527	5	45.857		
Residual	2589.289	69	26.754	8.584	0.000(a)	1131.021	69	8.248	4.342	0.002(a)
Total	3767.70	74				1408.548	74			

Predictors: (Constant), RHSC, RSSC, TSS, WES, MEE, Dependent Variable: REU

From the above ANOVA table for public university, the calculated value of the statistic is $F_{cal} = 8.584$ but its tabulated value at 5% level of significance is $F_{5\%, 5, 74} = 0.999462$. As the calculated value (F_{cal}) is

greater than the tabulated value ($F_{5\%,5,74}$) at 5% level of significance, we reject the null hypothesis. That is, the coefficients are not zero and hence the monthly educational expenditure, the time spent in study per day, working except study, the result of SSC examination, the result of HSC examination have significant impact on the result of the examinations in university.

On the other hand, for the national university the calculated value of the statistic is $F_{cal} = 4.342$ but its tabulated value at 5% level of significance is $F_{5\%,5,74} = 0.999462$. As the calculated value (F_{cal}) is greater than the tabulated value ($F_{5\%,5,74}$) at 5% level of significance, we reject the null hypothesis. That is, the coefficients are not zero and hence the monthly educational expenditure, the time spent in study per day, the result of SSC examination, the result of HSC examination have significant impact on the result of the examinations in university.

5 Conclusion

Academic performance is an excellent measure of the transfer of knowledge in modern society. Some variables of interaction can be studied. This research finds that which factors affect the academic performance. The parent's education level is classified into the categories of illiterate, primary, secondary, higher secondary, graduate, higher degree. From the analysis, it is found 32.0% of the fathers of the students studying in public university are graduated whereas 13.3% of the fathers of the students studying in national university are graduated. 9.3% of the fathers of the students studying in public university are illiterate whereas 14.7% of the fathers of the students studying in national university are illiterate. 41.3% of the mothers of the students studying in public university have secondary education level whereas 24.0% of the mothers of the students studying in national university have same education level. 14.7% of the mothers of the students studying in public university are illiterate whereas there are 29.3% illiterate mothers in case of national university.

It is found that most of the fathers in case of public and national university are farmer. 26.7% of the fathers of the students studying in public university are farmer where as 62.7% of those in case of national university are of same occupation. 20.0% of the fathers of the students studying in public university have government service whereas 16.0% of those in case of national university are of same occupation. Most of the mothers of the students of both university are house-wife. 90.7% mothers of the students of public university are house-wife whereas 93.3% mothers of the students of national ones are house-wife.

The families (38.7%) of the students studying in public university have the monthly income interval of tk. 20000 to tk. above while the families (36.0%) of the students studying in national ones have the monthly income interval of tk. 3000 to tk. 12000. Most of the families (50.7%) of the students studying in public university have monthly family expenditure interval of tk. 2000 to tk. 7000 while most of the families (56.0%) of the students studying in national university have same monthly expenditure. The educational expenditures of the students of public and national university are different. It is found that 66.7% of the students of public university spend tk. 1000 to tk. 2000 on educational purpose whereas 26% of the students of national university spend tk. 1000 to tk. 2000 on this purpose.

It is observed that most of the students of public university (73.3%) stay in hall whereas 33.3% students of the national university stay in hall. It is found that the students of public university study 3.77 hours in department, 2.85 hours in resident, 0.75 hours and 7.37 hours in total daily on average. On the other hand those of national university study 2.77 hours in department, 1.93 hours in resident, 0.44 hours and 5.14 hours in total daily on average. It is found that most of the students of both universities want to be government service holder. 62.7% and 57.3% of the students of public and national university respectively have the desire of having government service. 8.0% of the students of public university are ambitious of having non-government service while 16.0% of the students of national university are ambitious of having this job. 8.0% of students of the public university are desirous of being teacher while 4.0% of students of the national university are desire of being teacher respectively.

From the analysis in Table 8, the monthly expenditure, time spent in study per day, working except study, the result of SSC examination and the result of HSC examination positively affect their result of the examinations in university but working except study negatively affect this result in Table 8. From the ANOVA Table 9, that is, the coefficients are not zero and hence the monthly educational expenditure, the time spent in study per day, working except study, the result of SSC examination, the result of HSC examination have significant impact on the result of the examinations in university.

Competing Interests

Authors have declared that no competing interests exist.

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