

An Analysis of the Factors Affecting Academic Performance of Undergraduate Students

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Abstract: The aim of this study is to analyze the factors affecting the academic performance of undergraduate students. Work in this area has the potential to provide important suggestions to improve the standard and quality of education and performance of students studying at Varendra University as well as other similar institutions. Primary data was collected from 299 undergraduate students (4th to 12th semester) through a well-defined questionnaire using a simple random sample technique and followed a face to face interview method. The data was collected for the Fall-2019 semester when the total population was 2800. Then the raw data was organized using Microsoft Excel. Afterward, the data were analyzed in STATA 14.2. Pearson Correlation Coefficient test was done to observe the strength of the relationship among variables. Through a one-way ANOVA test factors such as class lecture understanding level of students, active participation in a university program, attentiveness, HSC grade, sharing the result with parents found significant. Though the result of this study is based on a particular private institution the findings can be useful when comparing the results of a similar entity. The findings of the study would help students to understand their strengths and weakness and act properly for better academic achievement. Also, the authority will be conscious when implementing policy toward ensuring better academic performance.

Key words: academic performance, undergraduate students, simple random sampling, Pearson correlation coefficient, ANOVA test.

JEL classification: C1, C8

I. INTRODUCTION

Rajshahi is well known as a green city and educational centre of Bangladesh. The city is home to many renowned educational institutions of Bangladesh both public and private educational institutions. Varendra University (VU) is the first Government approved private university in Rajshahi. The credit for the idea of establishing this University goes to Varendra University Trust (VUT), which is the founder organization of the University. This Trust is a non-political and non-profit oriented organization. The mission of the university is to contribute to national development by producing innovative, skilled, and technologically trained manpower. The vision of Varendra University is to emerge as one of the leading and premier centers of higher studies in arts, social science, science, engineering and technology.

With the mission and vision of Varendra University, it is our primary objective to analyse the factors affecting academic performance of undergraduate students studying undergraduate program at Varendra University. Because I believe, work in this area has the potential to provide important suggestions to improve the standard and quality of education and performance of students studying at Varendra University. Moreover, the teachers, parents and students will know the factors that affect the academic performance of students studying at this university as well as the result should be beneficial for all those living in northern part of Bangladesh. Since it's a well known private university at northern part of Bangladesh.

II. LITERATURE REVIEW

According to Hansen (2000) and Kingdon (2006) academic performance is the measurement of student achievement across various academic subjects. It is widely measured in terms of grades and test scores. Graetz (1995) said, one's educational success depends very strongly on the socio-economic status of the parents. According to Considine and Zappala (2002). Families where the parents are advantaged socially, educationally and economically foster a high level of achievement in their children. The study of Ali et.al (2013) Children academic performance depends on the social investment in children; the parental investment in children; and the choices that children make, given the investments in and opportunities available to them. Guimares and Sampaio (2011) found that family background and study environments are key determinants of student performance. According to the study of Lotsi (2019), there don't exist any significant relationship between GPA of level 100 Legon campus students and gender and previous SHS attended.

There are very few researches on this issue in Bangladesh. Alam et.al (2014) revealed that age, gender, past academic track, medium of education, school/college location and absence/presence in the classes had influenced the academic performances of a student. Among these variables the most important variable for all the faculties turned out to be past academic result variables. Another study of Ahmmed and Salim (2018) identifies variables such as type of department, result of pre-university public examinations, gender, class attendance, teacher-student relationship, self-confidence level

of the students, depression and amount of credit hours to impact the academic performance level significantly.

Reviewing various national and international literatures, it is found that factors like gender, location of residence, family income, student’s physical health condition, educational background of family, teacher-student relationship and many other factors affect academic performance of students. In our study we will analyse these factors along with some new factors such as attentiveness in study, influence of family members for study, sharing results to parents, understanding level of students and so on.

III. CONCEPTUAL FRAMEWORK

The study covers the independent variables categorized as socio economic variables such as location of residence, yearly family income, student’s physical health status and educational background of family. Demographic variables such as age and gender, institutional variables such as department, teacher student relationship, class lectures, lecture notes, class hours. Individualistic variables such as SSC and HSC result, regularity and punctuality, understanding level, virtual hour, study hour, participation in university program, self-confidence, depression, sharing result with parents. This idea has been shown in Figure 1.

To verify the relationship a general hypothesis was formed as follows.

Socio economic, demographic, institutional and individualistic variables are significantly related with academic performance (GPA) of students.

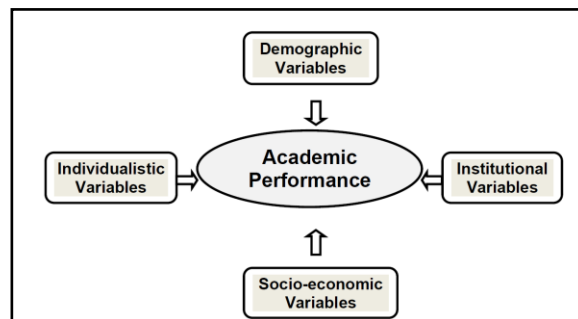


Figure 1: Conceptual Framework

IV. DATA AND METHODOLOGY

Primary data was collected from undergraduate students (4th to 12th semester) through a well-defined questionnaire. We provided questionnaires to 340 students studying at the Varendra University using simple random sample technique and the two research assistant assigned for this project collected the data through a face to face interview. We found 299 questionnaires answered correctly. Since many students were not interested to give some personal information though we did not use their name or id in our research project. However, our final sample size reduced to 299. The data was collected for the Fall-2019 semester when the total population was 2800. Then the raw data was organized using Microsoft Excel. Afterwards the data were analyzed in STATA 14.2.

The following table illustrates a clear picture of some selected variables and their measurement method used in this study.

Table 1: Design of variables

Concept	Variable	Indicator	Measurement
Academic Performance	GPA	CGPA of the last semester	2.00-2.99=bad, 3.00-3.24=average, 3.25-3.49=good, 3.50-3.74=excellent, 3.75-4.00=extraordinary
Understanding level	Class lecture understanding level	Percentage of understanding	0-20%=poor, 21-40%=average, 41-60%=good, 61-80%=very good, 81-100%=excellent
participation	Active participation in University program	Total number of programs attended or participated	Valuing each participation as one. Means is a student participate in 3 programs in a semester, the value is 3.
Attentiveness	Student attentiveness	Percentage class attended and weekly study hour at home	If a student’s attendance is 80% or more and do study in average of 2 hours in a week, categorized as attentive, otherwise he/she is inattentive.
Grade in HSC	GPA in HSC	HSC result measured in GPA as published	2.00-2.49=bad, 2.50-2.99=average, 3.00-3.24=good, 3.25-3.49=very good, 3.50-4.00=Excellent
Sharing result	Sharing academic issues with parents	Measured on whether students share their academic result and other problems to parents.	Those who share with their parents or family are categorized as Yes, otherwise its NO.

In our study at first we used Pearson correlation coefficient to measure the strength between dependent and independent variables and secondly ANOVA (Analysis of Variance) to determine the significant factors (independent variables) affecting GPA of undergraduate students (dependent variable).

We can express the null and alternative hypotheses of one-way ANOVA as:

$$H_0: \mu_1 = \mu_2 = \mu_3 = \dots = \mu_k \text{ (all population means are equal)}$$

$$H_1: \text{at least one } \mu_i \text{ differs.}$$

Where μ_i is the population mean of the i^{th} group ($i = 1, 2, \dots, k$).

V. RESULT AND DISCUSSION

Pearson correlation coefficient

In a study AnesthAnalg (2018) stated Pearson correlation coefficient as a dimensionless measure of the covariance, which is scaled such that it ranges from -1 to +1. The strength of the correlation (r-value) was interpreted according to the following common definitions: 0.00 to 0.19 "very weak", 0.20 to 0.39 "weak", 0.40 to 0.59 "moderate", 0.60 to 0.79 "strong", and 0.80 to 1.0 "very strong". We have used the same definition here to interpret the strength among variables.

By measuring the correlation coefficient for some selected variables, we found most of the relationships moderate and strong except for monthly family income of the students. It surprisingly shows a negative relation though a weak one. Afterwards in ANOVA we couldn't find any significant relationship between family income and academic performance of students. This implies the benefit of globalization where everyone can be benefited with a very low cost, sometimes even free of cost. Though institutional education costs a lot but learning can be possible just by surfing the internet.

Table 2. Pearson Correlation Coefficient in STATA 14.2

Academic performance (CGPA)	Value of r	Strength of covariance
Sex	0.0547	Moderate and positive
Hours spent on social media	0.0608	Strong and positive
Influence of family members	0.0751	Strong and positive
Family income (monthly)	-0.0390	Weak and negative
Educational qualification of father	0.0723	Strong and positive
Time spent on You Tube	0.0577	Moderate and positive

ANOVA Result

Table 3. Analysis of variance between GPA and class lecture understanding level of students

Source	SS	df	MS	F	Prob > F
Between groups	23.0418085	3	7.68060282	4.39	0.0048
Within groups	515.867891	295	1.74870471		
Total	538.909699	298	1.80842181		

Bartlett's test for equal variances: $\chi^2(2) = 1.9575$ Prob> $\chi^2 = 0.376$

Our first ANOVA result reveals that the understanding levels of students has a significant impact on their academic performance. That is, students whose level of understanding is higher, also tends to have a better academic performance. So, it is very important to concentrate on the class lecture as well as be regular in class.

Table 4. Analysis of Variance between GPA and active participation in Uni program

Source	SS	df	MS	F	Prob > F
Between groups	27.0991489	1	27.0991489	15.73	0.0001
Within groups	511.81055	297	1.72326785		
Total	538.909699	298	1.80842181		

Bartlett's test for equal variances: $\chi^2(1) = 7.4002$ Prob> $\chi^2 = 0.007$

The result of one way ANOVA between GPA and active participation in Varendra University programs indicates a significant relation. Here active participation in University program indicates that students are enthusiastic and motivated to take part in various co-curricular and extra-curricular activities arranged by the department or university. As expected, students who participate in the university program actively are also tend to have a good academic performance.

Table 5. Analysis of Variance between GPA and attentiveness of students

Source	SS	df	MS	F	Prob > F
Between groups	27.1839647	1	27.1839647	15.78	0.0001
Within groups	511.725734	297	1.72298227		
Total	538.909699	298	1.80842181		

Bartlett's test for equal variances: $\chi^2(1) = 0.7441$ Prob> $\chi^2 = 0.388$

Table 5 states a significant relationship between a student's academic performance and attentiveness. Attentiveness is measured by the mean value of weekly study hours and attendances in class. Attentive students tend to have good academic performance. That is students who study an average of 2 hours in a week and have an attendance of at least 80%, are categorized as attentive students. It should notify that ANOVA result for the variables regular class and weekly study hour was insignificant individually. This implies, to earn a good academic result students should have both qualities not just one. They have to study at home as well as to attend classes regularly.

Table 6. Analysis of Variance between GPA and grade in HSC

Source	SS	df	MS	F	Prob > F
Between groups	24.6721305	4	6.16803263	3.53	0.0079
Within groups	514.237568	294	1.74910738		
Total	538.909699	298	1.80842181		

Bartlett's test for equal variances: $\chi^2(4) = 4.1638$ Prob> $\chi^2 = 0.384$

According to the result stated in Table 6. students past academic results have a significant relation to GPA at the undergraduate level. We have taken the result of HSC of the respective students as their past academic result. Students having a good grade in HSC level tend to have a good academic performance at the undergraduate level also.

Table 7. Analysis of variance between GPA and sharing with parents

Source	SS	df	MS	F	Prob > F
Between groups	8.53180023	1	8.53180023	4.78	0.0296
Within groups	530.377899	297	1.78578417		
Total	538.909699	298	1.80842181		

Bartlett's test for equal variances: $\chi^2(1) = 1.2701$ Prob> $\chi^2 = 0.260$

We have got a new variable sharing with parents defined as students who share their academic result and other academic issues with their parents significantly affect GPA. This implies that, friendly parents are beneficial for student's academic performance. Maybe they can help their child when the students face problems and could study properly in a good family environment. This is picturized in Table 7.

VI. CONCLUDING REMARKS

Our main objective was to determine the factors affecting academic performances of undergraduate students studying at Varendra University, Rajshahi. Our one way ANOVA result suggests five variables i.e. Class lecture understanding level of students, active participation in university program, attentiveness, grade in HSC, sharing result with parents significantly affect academic performance of the students. Although in Pearson correlation coefficient tests some other variables i.e. time spent in social media, influence of family members, educational qualification of parents and watching YouTube videos had strong relation with GPA, but we didn't find these variables significant in ANOVA test. So we can conclude that, though social media, YouTube, these conflicting variables have strong relation with academic performance, these don't affect academic performance significantly. Today's generation are rebuked and blamed due

to social media very often. But we should reconsider before blaming them. Maybe they are watching helpful and educational videos in YouTube and are members of some beneficial groups in social media where they spend their time. So, the university authority and professional should be careful when taking policies regarding improvements of academic performances of students. Though the result of this study is based on a particular private institution the findings can be useful when comparing the results of a similar entity.

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REFERENCES

- [1] Ali, S. Haider, J. Munir, F. Khan, H. and Ahmed, A. (2013). "Factors Contributing to the Students Academic Performance: A Case Study of Islamia University Sub Campus". *American Journal of Educational Research*. 1(8), 283-289.
- [2] Alam, M.M. Billah, A. M. & Alam, M.S (2014). "Factors affecting academic performance of undergraduate students at IIUC, Bangladesh." *Journal of Education and Practice*. Vol.5, No.39.
- [3] Ahmmed, M. M. & Salim, Z.R. (2018). "Determinants of Academic Performance of Undergraduate Students in Private Universities in Bangladesh: A Case Study." *Global Journal of Human-social Science*. 18 (11).
- [4] Considine, G. & Zappala, G. (2002). "Influence of social and economic disadvantage in the academic performance of school students in Australia". *Journal of Sociology*. 38, 129-148.
- [5] Graetz, B. (1995). "Socio economic Status in Education Research and Policy". *Socio-economic Status and School Education*. 3(4), 25-30.
- [6] Guimares J. and Sampaio, B. (2011). "Education Economics, Family background and students achievement on a university entrance exam in Brazil". *Education Economics*. 1, 38-59.
- [7] Hansen, Joe B. (2000). "Student Performance and Student Growth as measure of success: A evaluator's perspective". Paper presented at the Annual Meeting of the *American Educational Research Association*.
- [8] <http://www.anesthesia-analgesia.org/> (2018). 126 (5).
- [9] Kingdon, G. G. (2006). "Teacher characteristics and student performance in India: A pupil fixed effects approach". *Global Poverty Research Group*. GPRG-WPS-059.
- [10] Lotsi, A. (2019). Statistical analysis of factors affecting grade point average of level 100 students: A case study of University of Ghana Legon Campus. *Journal of Mathematics Education*. 4(2), 87-96.

Appendices

Questionnaire

CIR research, Varendra University

(please answer the following questions with honesty)

Department:

Semester:

Gender:

Age:

1. your total GPA until last semester:
2. Did you take any retake/ improvement in this semester? yes/ no
3. Total credit hour in this semester?
4. Everyday class hour?
5. How much you understand the class lecture? a) 0 to 20% b) 21 to 40% c) 41 to 60% d) 61 to 80% e) 81 to 100%
6. Do you behave the follows ? a. Gossip in the class B.Using cell phones c. playing games in cell phones d. Disrespect teacher e. Others
7. Do you actively participate in university program? yes/ no
8. if no, why?
9. Do you think teacher should provide class notes? yes/ no
10. do you copy lectures? yes/ no
11. if yes, why? a. Easily understandable b. need less time to prepare for exam. c. convenient d. Others
12. if no, why? a. Boring b. can't concentrate c. not interested. d. Others
13. Do you attend classes regularly? yes/ no
14. if No, why? a. don't interested in the lecture b. don't like to do classes c. sickness d. University is far away from home. e. Others
15. Do you study in seminar library? yes/ no
16. if no, why? a. not sufficient books b. not enough space c. not interested d. Others
17. If yes, how much time do you read average in a week?
18. How much time do you study at home in average in a week?
19. Where are you from? a. rural b. Urban
20. Your GPA in HSC exam?
21. your category in HSC? a. science B. Arts c. commerce d. Others
22. Where do you live now? a. in a mess b. at home Om. c. a relative home d. Others
23. How much time it takes to reach university from your residence?
24. Have you ever missed your exams? yes/ no

25. if yes, why?
26. Do you have Wi-Fi connection?
27. Which social media do you use?
28. how much time do you spend in social media everyday?
29. do you watch youtube videos?
30. what kind of videos you watch most?
31. Do you play online games? yes /no
32. if yes, how much time you spend daily on online games?
33. Have you any problems like follows? a. financial problem b. relationship problem.c. health problem d. family problem e. Others
34. Do your problems affect your study? yes/ no
35. if yes, What are the sectors affected most?
36. Number of your family member?
37. Number of earnable person in your family?
38. What is your family's monthly income?
39. Do you share your results or other information with your parents? yes/ no
40. What is your father education level?
41. what is your mother's education level?
42. What is the main reason of your good or bad academic performance?

Thanks