

FACTORS AFFECTING THE ACADEMIC PERFORMANCE OF COLLEGE STUDENTS

By

NISHA ARORA *

NEETU SINGH **

* Freelancer Trainer, Gurugram, Haryana, India.

** Associate Professor, Department of Applied Sciences, World College of Technology & Management, Gurugram, Haryana, India.

Date Received: 28/04/2017

Date Revised: 26/06/2017

Date Accepted: 16/08/2017

ABSTRACT

The academic achievement of any student is the result of a complex interplay of various factors, such as study habits, personality trait, and personal interest of student as well as teaching skills of concerned faculties. This paper examines the relative importance of these factors on student's academic performance. The authors have collected data from 117 college/university students studying in Gurugram. To study the factors affecting academic grades of students, the authors have used factor analysis technique. Also to investigate the impact of these factors on academic grades, the they have used Multiple Regression Analysis (MRA) with dummy variable for introducing categorical variable 'gender'. Results of the analysis indicates teaching efficacy of educators, study habits, distraction factors, and family environment of student as significant predictors of academic performance of college students. Results also point towards gender difference in academic achievement of students. On average, girls achieve higher grade than boys. For the purpose of data analysis, Statistical Package for Social Sciences (SPSS) is used.

Keywords: College Student, Academic Performance, Gender, Data Analysis, SPSS.

INTRODUCTION

In the present era of globalization, growing economy and rapid development, the improvement of quality output and retention rates in higher education are of tremendous importance for the development of any nation. Higher education is perceived to be of enormous importance for an individual as it is incumbent for getting good jobs, success, and opportunities for better living. With the increasing number of educational institutes, there is a need to give emphasis on imparting specialized knowledge and technical skills to students to increase their productivity and opportunities for better living which leads towards the economic growth of a country.

The main objective of the educational institutes is to help students to understand the course material and obtain a grade that facilitates academic and professional advancement. Students learning performance is affected by numerous internal and external factors, including gender, age, study habits, discipline, class attendance, the contribution of a teacher in academic achievement of

students, time management, socialization, sleep patterns, partying behavior, socio-economic status, educational background of parents, etc. In the past few decades, there is a growing study on variables contributing effectively to the quality of academic achievement of students.

The aim of the present study is to investigate different factors influencing the academic performance of college students and enhance the quality of education. To achieve this aim, well-structured questionnaires were distributed to engineering students studying in different colleges of Gurugram. The result of the research concludes the fact that there are 5 important factors which contribute in determining academic level of the students among which teaching effectiveness of the concerned faculty is most significant.

1. Literature Review

There is a considerable amount of research available on factors affecting the academic performance of students at different study levels. The previous research pointed out many factors that influence students' academic

achievement.

Student's academic performance may be influenced by their faculty's attributes as they interact closely with their lecturers in their day-to-day interactions. The presentation of the module content by the concerned instructor should be made considering the interests of the students. As the attitude and motivation towards a module may be influenced by the way in which module content is presented to student (Sikhwari, et al., 2015). He also stated that there should be respect and trust in the interactions between students and the faculty. According to Adeyele and Yusuf (2012), the ability of the academic staff matters the most for students' good performance. Mlambo (2011) found that there is a positive impact on the performance of students in higher education and the lecturer's teaching style. The factor which motivates the students to attend classes is the way of teaching of the content using active learning approaches by the lecturer even if the topic under discussion is not interesting (Clay and Breslow 2006). Rahimpour and Magsoudpour (2011) studied teacher-students' interactions in task-based vs. form-focused instruction and found that students are motivated towards completion of a task when it is different and stimulating. In their study, Schwerdt and Wuppermann (2008) stated that the students' achievement is influenced by effective teaching practices. Lee and Rha (2009) concluded that the interactions and discussions of students with lecturer and the fellow students are important for the effective learning.

The study habits play an important role in achieving higher grades. Few researchers have examined the effect of time studying on the academic performance (e.g. Rogaten, et al., 2013). The length of sleep is related to academic performance of college students (Pilcher & Walters, 1997; Kelly, et al., 2001). However, Nonis and Hudson (2006) found that the amount of time spent studying or at work had no direct influence on academic performance. Kleijn et al. (1994) gave emphasis on the fact that empirically, deep and strategic learning strategies results in success at final examinations, however the surface learning results in failure.

The interactions with peer groups are helpful for quality

performance in higher education as friends having similar future plans get inspired by each other and perform better (Yousuf et al. 2011).

Socio-Economic Status (SES) and education of parents have a significant role in the overall academic achievement of the students (Farooq et al., 2011). He also concluded that girl students perform better than the male students. Educated parents can better communicate regarding academic activities and assist them in their work (Fantuzzo et al., 2000; Trusty, 1999). So the academic success depends on parental involvement as they help students to attain a higher level of quality (Barnard, 2004; Shumox & Lomax, 2001). Eamon (2005) concluded that the students from low socio-economic status show low performance in studies and obtained low scores as compared to the other students. In other studies also, socioeconomic status of families is considered to have a direct impact on students' academic achievement (Rich, 2000; Battle & Lewis, 2002; McCoy 2005; Sirin, 2005). Recently, Singh et al. (2016) concluded that the factor which affects academic performance the most is learning facilities followed by proper the guidance of parents.

2. Objectives

The following are the objective of this study.

- To study the factor affecting academic grades of student.
- To develop a model predicting academic performance of students based on identified factors.

3. Rationale of the Study

The quality of academic performance of students is affected by various factors, such as teaching effectiveness, student's study habits, distraction factors, family environment, etc. The study of academic performance of students may be helpful for the parents of the students as well as the policymakers of colleges. The quality of education can be improved by taking effective measures and necessary action about the factors which are more responsible for the academic performance of the students.

4. Research Methodology

The research is conducted by using the procedure of

survey method. Primary data has been collected from engineering students of Gurugram. Convenience sampling was used for the purpose of data collection. 120 students filled up the questionnaire, out of which 3 were not fit for use due to inadequate information. Data was analyzed on the basis of response provided by 117 respondents. Approximately 52% (61) of respondents were male while 48% (56) were female students.

Well-structured questionnaire by using 5-point Likert scale was developed for conducting the study. Data was collected in an anonymous way. Respondents were asked to give rating on the scale of 1 to 5 to different statements regarding the factors affecting the academic grades. First few statements addressed teaching effectiveness of their faculties, such as subject expertise, updated knowledge, teaching skills, student's involvement, etc. The authors have included some statements to assess study habits of the students. Also, other variables, such as distraction factors, family environment and personality traits of students are measured by using appropriate statements.

5. Limitation of the Study

The following are some limitations of the study.

- The study was conducted only on engineering students of Gurugram.
- Total variance explained by extracted five factors is 69.3%.
- Total variance explained by regression model is 60.17%.

6. Data Analysis and Analytical Results

6.1 Objective 1: To study the factor affecting academic grades of student

The authors have applied factor analysis to the responses provided by respondents. Factor analysis is a set of techniques, which, by analyzing correlations between variables, reduces their number into fewer factors, which explain much of the original data, more economically Nargundkar (2003).

To check the assumptions of factor analysis, the authors have analyzed measures of sampling adequacy by using Bartlett's test of sphericity and correlation between variables by KMO value. Bartlett's test of sphericity (approx

chi-square is 1037.790, degree of freedom is 153, significance is 0.000) and KMO value is 0.662 showed that sample data is fit for performing factor analysis.

For extracting independent factors, the authors have used Principal Component Analysis (PCA) and retained all the factors with eigenvalue greater than one. Eigenvalue represents the total variance explained by each factor. Table 1 confirms that there are five factors having Eigenvalues more than 1. For these extracted factors, total variance explained is also > 65 % (Table 1).

The results were obtained through orthogonal rotations with "varimax" and all the factor loadings greater than 0.4 were retained. The name of the factors, factor loadings, and reliability index are summarized in Table 2.

For the naming of the factors extracted, the authors have identified the associated variables. Thus Table 2 clearly depicts that Factor 1 is a linear combination of variable number 14, 12, 10, 11, and 13 ($\alpha=0.850$). Factor 2 is a linear combination of variable number 15, 18, 7, and 16 ($\alpha=0.847$). Factor 3 is a linear combination of variable number 8, 17, and 9 ($\alpha=0.754$). Factor 4 is a linear combination of variable number 5, 6, and 4 ($\alpha=0.729$). Factor 5 is a linear combination of variable number 2, 1, and 3 ($\alpha=0.624$).

6.1.1 Naming of Factors

- Factor 1: Teaching Effectiveness

The rotated matrix has revealed that respondents have perceived this factor to be the most important factor with the highest explained variance of 17.985%. Five out of sixteen variables load on significantly to this factor. The authors have named this factor as teaching effectiveness in terms of teacher's expertise on the subject, updated knowledge relevant to the subject, open discussion, teaching skills etc.

- Factor 2: Distraction Factors

It has been revealed to be the second most important factor with explained variance of 16.185%. Four variables were loaded onto this factor. Distraction factors like mobile phones, internet, peer pressure, etc., load high on this factor and thus the authors have named this factor as distraction factors.

| Component | Total | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | | Rotation Sums of Squared Loadings | |
|-----------|-------|---------------------|--------------|-------|-------------------------------------|--------------|-------|-----------------------------------|--------------|
| | | % of Variance | Cumulative % | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 3.993 | 22.186 | 22.186 | 3.993 | 22.186 | 22.186 | 3.237 | 17.985 | 17.985 |
| 2 | 3.338 | 18.544 | 40.730 | 3.338 | 18.544 | 40.730 | 2.913 | 16.185 | 34.171 |
| 3 | 2.365 | 13.139 | 53.868 | 2.365 | 13.139 | 53.868 | 2.406 | 13.368 | 47.538 |
| 4 | 1.729 | 9.606 | 63.474 | 1.729 | 9.606 | 63.474 | 2.049 | 11.382 | 58.920 |
| 5 | 1.049 | 5.826 | 69.300 | 1.049 | 5.826 | 69.300 | 1.868 | 10.379 | 69.300 |
| 6 | .888 | 4.933 | 74.232 | | | | | | |
| 7 | .778 | 4.320 | 78.553 | | | | | | |
| 8 | .731 | 4.060 | 82.613 | | | | | | |
| 9 | .598 | 3.321 | 85.934 | | | | | | |
| 10 | .479 | 2.663 | 88.597 | | | | | | |
| 11 | .470 | 2.612 | 91.209 | | | | | | |
| 12 | .346 | 1.922 | 93.131 | | | | | | |
| 13 | .297 | 1.650 | 94.781 | | | | | | |
| 14 | .265 | 1.470 | 96.251 | | | | | | |
| 15 | .242 | 1.346 | 97.597 | | | | | | |
| 16 | .164 | .911 | 98.508 | | | | | | |
| 17 | .152 | .844 | 99.352 | | | | | | |
| 18 | .117 | .648 | 100.000 | | | | | | |

Extraction Method: Principal Component Analysis

Table 1. Total Variance Explained

| Factor Number | Name of Dimension | Reliability Statistics | Variables | Factor Loadings |
|---------------|------------------------|------------------------|-----------|-----------------|
| F1 | Teaching_Effectiveness | 0.850 | 14 | 0.859 |
| | | | 12 | 0.858 |
| | | | 10 | 0.808 |
| | | | 11 | 0.763 |
| | | | 13 | 0.643 |
| F2 | Distraction_Factors | 0.847 | 15 | 0.825 |
| | | | 18 | 0.808 |
| | | | 7 | 0.780 |
| F3 | Personality_Traits | 0.754 | 16 | 0.722 |
| | | | 8 | 0.796 |
| | | | 17 | 0.788 |
| F4 | Study_Habits | 0.729 | 9 | 0.749 |
| | | | 5 | 0.876 |
| | | | 6 | 0.865 |
| F5 | Motivation | 0.624 | 4 | 0.471 |
| | | | 2 | 0.741 |
| | | | 1 | 0.659 |
| | | | 3 | 0.648 |

Table 2. Naming of Factors

- Factor 3: Personality Traits

Three variables load on this factor with explained variance of 13.368%. This factor includes personality-related variables like disciplined behaviour, maintaining a good relationship with friends, teachers & family and socializing/networking skills.

| Variable | Coefficient | Standard Error |
|--------------------------------|-------------|----------------|
| Intercept | 7.39322 | 0.11036 |
| Teaching_efficacy | 0.99316 | 0.15144 |
| Teaching_efficacy ³ | -0.20337 | 0.05976 |
| Study_habit ³ | 0.11502 | 0.02525 |
| Family_environment | 0.21235 | 0.06737 |
| Distraction ³ | 0.08319 | 0.02461 |
| Gender_Male | -0.61738 | 0.14419 |

Table 3. Regression Coefficients

- Factor 4: Study Habits

The next factor comprises of three variables related to study habits of students. Variables like to study regularly, putting more effort to learn difficult concepts, to be attentive during lectures together account for 11.382% of the variation.

- Factor 5: Family Environment

This factor has an explained variance of 10.379% with variables related to family environment, such as surrounding conducive to study, motivation from parents & family members, their involvement in the academic growth of the student, etc.

6.2 Objective 2: To develop a model predicting academic performance of students based on identified factors

For developing a predictive model for academic

performance of students, the authors have used the least square multiple regression analysis using a dummy variable for categorical predictor 'gender'. The authors have used grades of students as response variable and gender, teaching effectiveness, distraction factors, personality traits, study habits, and family environment as predictors.

The authors arrived at the following statistically significant regression model (F-statistic = 30.52 on 6 & 110 DF, p-value: < 2.2e-16) with 62.48% multiple R-squared and 60.43% adjusted R-squared.

$$\text{Grades (for male students)} = 6.77584 + (0.99316 * \text{Teaching Effectiveness}) - (0.20337 * \text{Teaching Effectiveness}^3) + (0.21235 * \text{Family Environment}) + (0.11502 * \text{Study Habits}^3) + (0.08319 * \text{Distraction Factors}) \quad (1)$$

and

$$\text{Grades (for female students)} = 7.39322 + (0.99316 * \text{Teaching Effectiveness}) - (0.20337 * \text{Teaching Effectiveness}^3) + (0.21235 * \text{Family Environment}) + (0.11502 * \text{Study Habits}^3) + (0.08319 * \text{Distraction Factors}) \quad (2)$$

The model summary is depicted in Table 3. The model shows that teaching effectiveness of concerned faculties is contributing the most towards academic growth of students. Other important predictors of academic grades of students are their study habits, family environment, and distraction factor. Also, the model revealed that there is a gender gap in the academic grade of students. On an average, grades for female students are slightly higher than that of male students. These entire factors together explain more than 60% variation in the academic grade of college students.

- Regression diagnostic tests revealed that overall, the data met regression assumptions.
- Result of t-test (t-statistics = 0, df = 116, p-value = 1) suggests that expected value of residuals is zero.
- Result of Breusch-Pagan test (BP-statistics = 2.7847, df = 6, p-value = 0.8353) suggests that there is homoskedasticity.
- Result of Anderson-Darling normality test (A-statistics = 0.6296, p-value = 0.09857) suggests that residuals are

normally distributed. Same can be verified by Shapiro-Francia normality test (W = 0.9799, p-value = 0.07169).

- Results of Ramsey's RESET test (RESET = 1.8543, df1 = 2, df2 = 107, p-value = 0.1616) suggests that the functional form of the model is correctly specified.

In addition, tests for multi-collinearity revealed low Variance Inflation Factors (VIFs) for the independent variables (VIFs were less than 10 in all cases).

Concluding Remarks and Recommendations

This present study was conducted to identify the factors that affect the student's performance. The study found that teaching effectiveness of faculties, student's study habits, distraction factors, and family environment are the factors that can influence the student's grades. Teacher's expertise on the subject, ability to create interest in the subject, interaction with students play an important role in students' achievement. Also, students' effective study habits and motivation from family help him/her perform better in academics. The study also revealed that controlling for other factors, academic grades for female students is higher than that of boys.

The student performance can be improved if the teaching faculty of college provides proper learning facilities and use effective teaching learning approaches to the students and also improve the environment of the college. The proper study habits are important to improve the performance of the students. The students should be properly guided and motivated by the parents from time to time to improve their study habits. Parents should create the proper environment for study in their family. If the student knows well about the abilities, competence, and distracts less; then he performs well.

References

- [1]. Adeyeye, J.S. & Yusuf, Y.S., (2012). Effect of teaching method, choice of discipline and student-lecturer relationship on academic performance. *Journal of Economics and Sustainable Development*, 3(7), 1-7.
- [2]. Barnard, W. M. (2004). Parent involvement in elementary school and educational attainment. *Children and Youth Services Review*, 26, 39-62.

- [3]. Battle, J. & Lewis, M. (2002). The increasing significance of class: The relative effects of race and socioeconomic status on academic achievement. *Journal of Poverty*, 6(2), 21-35.
- [4]. Clay, T. & Breslow, L. (2006). Why Students don't attend Class. *MIT Faculty News Letter*, 18, 6-7.
- [5]. Eamon, M. K. (2005). Social demographic, school, neighborhood, and parenting influences on academic achievement of Latino young adolescents. *Journal of Youth and Adolescence*, 34(2), 163-175.
- [6]. Fantuzzo, J. Tighe, E., & Child, S. (2000). A family involvement questionnaire. *Journal of Educational Psychology*, 92(2), 367.
- [7]. Farooq, M.S., Chaudhry, A.H., Shafiq, M., & Berhanu, G. (2011). Factors affecting students' quality of academic performance: A case of secondary school level. *Journal of Quality and Technology Management*, 7(2), 01-14.
- [8]. Kelly, W., Kelly, K., & Clanton, R. (2001). The relationship between sleep length and grade-point average among college students. *College Student Journal*, 35, 84-87.
- [9]. Kleijn, W. C., Van der Ploeg, H. M., & Topman, R. M. (1994). Cognition, study habits, test anxiety, and academic performance. *Psychological Reports*, 75, 1219-1226.
- [10]. Lee, H. J. & Rha, I. (2009). Influence of structure and interaction on student achievement and satisfaction in webbased distance learning. *Educational Technology and Society*, 12(4), 372-382.
- [11]. McCoy, L. P. (2005). Effect of demographic and personal variables on achievement in eighth grade algebra. *Journal of Educational Research*, 98(3), 131-135.
- [12]. Mlambo, V. (2011). An analysis of some factors affecting student academic performance in an introductory Biochemistry course at the University of the West Indies. *Caribbean Teaching Scholar*, 1(2), 79-92.
- [13]. Nargundkar, R. (2003). *Marketing research-Text & cases 2E*. Tata McGraw-Hill Education.
- [14]. Nonis, S. & Hudson, G. (2006). Academic performance of college students: Influence of time spent studying and working. *Journal of Education for Business*, 81(3), 151-159.
- [15]. Pilcher, J. & Walters, A. (1997). How sleep deprivation affects psychological variables related to college students' cognitive performance. *Journal of American College Health*, 46, 121-127.
- [16]. Rahimpour, M. & Magsoudpour, M. (2011). Teacher-students' interactions in task-based vs. form-focused instruction. *World Journal of Education*, 1(1), 171-178.
- [17]. Rich, A. (2000). Beyond the Classroom: How Parents Influence their Childrens Education. *CIS Policy Monograph 48*, Centre for Independent Studies, Sydney.
- [18]. Rogaten, J., Moneta, G., & Spada, M. (2013). Academic performance as a function of approaches to studying and affect in studying. *Journal of Happiness Studies*, 14(6), 1751-1763.
- [19]. Schwerdt, G. & Wuppermann, A. C. (2008). Do teaching practices influence student achievement. *CESIFO and IFO Institute for Economic Research*, 1-19.
- [20]. Shumox, L., & Lomax, R., (2001). Parental efficacy: Predictor of parenting behavior and adolescent outcomes. *Parenting*, 2(2), 127-150.
- [21]. Sikhwari, T. D., Maphosa, C., Masehela, L., & Ndebele, C. (2015). Exploring Students' Views on Factors affecting Academic Performance in a South African University. *International Journal of Education Science*, 10(3), 442-450.
- [22]. Singh, S. P., Malik, S. & Singh, P. (2016). Factors affecting academic performance of students. *Indian Journal of Research*, 5(4), 176-178.
- [23]. Sirin, S. R. (2005). Socioeconomic status and academic achievement: A meta-analytic review of research. *Review of Educational Research*, 75(3), 417-453.
- [24]. Trusty, J. (1999). Effects of eighth-grade parental involvement on late adolescents' educational expectations. *Journal of Research and Development in Education*, 32(4), 224-233.
- [25]. Yousuf, M., Sarwar, M., & Ranjha, A. (2011). A study of non-cognitive variables of academic achievement at higher education: Nominal group study. *Asian Social Science*, 7(7), 53-58.

RESEARCH PAPERS

Appendix

Questionnaire

Gender:

CGPA:

What, as per you, affects your grades the most?

(Optional):

Direction: Please give appropriate rating to the following statements by checking (√) the correct box using the following scales:

5 – Always 4 – Often 3 – Sometimes
2 – Rarely 1 – Never

| S. No. | Statement/ Rating | 5 | 4 | 3 | 2 | 1 |
|--------|--------------------------------------------------------------------------------------------------------------|---|---|---|---|---|
| 1 | My teachers explain the objectives of the lesson clearly at the start of each period. | | | | | |
| 2 | My teachers are open to suggestions & opinions. | | | | | |
| 3 | My teachers have mastery of the subject matter. | | | | | |
| 4 | My teachers are organized in presenting subject matters by systematically following course outline. | | | | | |
| 5 | My teachers are updated with present trends, relevant to the subject matter. | | | | | |
| 6 | I study the lessons I missed if I was absent from the class. | | | | | |
| 7 | I listen attentively to the lectures & exert more efforts for difficult assignments. | | | | | |
| 8 | I actively participate in the discussion, answering exercises and/or clarifying things I did not understand. | | | | | |
| 9 | I have a good relationship with the students and teachers. | | | | | |
| 10 | I impose proper discipline and I am not lenient in following the prescribed rules. | | | | | |
| 11 | I actively participate in community forums & Q/A sites for discussions related to technical queries. | | | | | |
| 12 | I use internet only to learn difficult concepts and don't get distracted by it while studying. | | | | | |
| 13 | I do not get distracted easily by my friends. | | | | | |
| 14 | I don't let my mobile phone to distract me while studying. | | | | | |
| 15 | Spending time on non-academic/extracurricular activities does not hamper my studies. | | | | | |
| 16 | My parents involvement in my academics motivates me to improve my study. | | | | | |

ABOUT THE AUTHORS

Nisha Arora is currently working as a Freelancer Trainer in the areas of Statistics, Machine Learning, and R Programming. She is a proficient academician in the field of Mathematics & Statistics. She has worked with reputed institutes like Amity University & G D Goenka University, Gurugram, India. She has a wide variety of experience in teaching Engineering, Management, Commerce and Applied Science courses at UG, PG, Ph.D, and Executive level. She has published several research papers in refereed National/International Journals. She has participated in various training programmes in the area of Mathematics, Operations Research & Data Science.



Dr. Neetu Singh is an Associate Professor in the Department of Applied Sciences at the World College of Technology and Management, Gurugram, India. She has completed M.Sc in Mathematics and Ph.D in Mathematics from Dr. Bhim Rao Ambedkar University, Agra, India. Her research specialisation is in Operations Research. Her research interests, include Queueing Theory, Inventory Theory, and Stochastic Modelling. She has published several research papers in National and International Journals and has presented/published papers in several National and International Conferences and has successfully organised a National Conference.

