

Determinants of Academic Performance Among Undergraduate Students: A Case Study of University of Peshawar (Pakistan)

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Abstract

This study examines the factors influencing the academic performance of undergraduate students at the University of Peshawar. By employing a stratified random sampling method with 530 students, and utilizing Multiple Linear Regression, the research identifies several key predictors of cumulative grade point average (CGPA). The findings reveal that higher marks in the Secondary School Certificate (SSC) examinations are strongly associated with a higher CGPA, underscoring the significance of prior academic achievement. Additionally, a positive correlation is observed between parental education levels and students' academic performance, suggesting that parents with higher education levels contribute to a more supportive educational environment. Active parental support is also a significant predictor of higher CGPA, emphasizing the crucial role of encouragement and assistance from home. Furthermore, students who exhibit greater attention in class tend to achieve higher CGPA, highlighting the importance of classroom engagement. Other notable factors include HSSC marks, father's income, financial support for accommodation, effort in solving tutorial questions, the presence of a study space, and daily study time. These insights offer valuable guidance for educators and policymakers in developing targeted strategies to enhance student support systems and improve academic outcomes.

Keywords: Financial Support for Accommodation, Attention in Class, Effort in Solving Tutorial Questions, Time Spent Studying Daily.

Introduction

Education is the process of gaining knowledge, skills, values, and habits through formal systems like schools, colleges, and universities, where students learn under the guidance of teachers and professors. Formal education is a structured learning process that occurs in organized institutions, following set policies to ensure quality and fairness. It includes primary, secondary, and higher education, with each stage building on the previous one. Students acquire academic knowledge and practical skills through a planned curriculum, culminating in certificates or degrees that

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demonstrate their competence. Teaching methods are designed to meet the needs of different ages and learning objectives, preparing individuals for further education or the workforce. Formal education lays the foundation for lifelong learning, providing essential qualifications and skills for future success (Bransford et al., 2000; OECD, 2019).

In contrast, informal education is self-directed learning that takes place outside traditional schools. It is driven by personal interests and involves learning through experiences, observation, and reflection. This type of education can occur in various environments, such as museums, libraries, and workplaces, or through interactions with peers, family, and mentors. Unlike formal education, informal education is flexible and tailored to individual needs, fostering personal growth and lifelong learning. It complements formal education by offering practical applications and reinforcing concepts, thereby enriching the overall learning experience (Knowles, 1980; Livingston, 2001). The stages of formal education—primary, secondary, and higher education—each serve distinct purposes. Primary education focuses on foundational subjects like math, language, and science, aiming to build basic literacy and numeracy skills. Secondary education, typically for ages 11-18, expands on this foundation with more specialized subjects, preparing students for higher education or the workforce. This stage may include lower and upper secondary levels, with assessments leading to diplomas or certificates. Higher education offers advanced training in specialized fields, including undergraduate, postgraduate, and doctoral programs, focusing on developing deep knowledge and critical thinking skills, culminating in degrees or certifications (UNESCO, 2020; Trow, 1973).

Primary, secondary, and higher education are key stages in the formal education system, each serving distinct purposes. Primary education focuses on foundational learning in basic subjects like mathematics and language, emphasizing literacy, numeracy, and social development. Assessment is often formative, aiming at understanding and progression rather than high-stakes exams. Secondary education, spanning ages 11-18, builds on primary knowledge and introduces more specialized subjects, with assessments leading to diplomas or certificates. Higher education, including undergraduate and postgraduate programs, provides advanced training for specialized careers, focusing on in-depth knowledge and expertise. Curriculum, encompassing content and learning objectives, and pedagogy, referring to teaching methods, are fundamental components of educational practice, shaping how knowledge is delivered and acquired.

Education seeks to develop individuals who are intellectually, socially, economically, and ethically prepared to contribute positively to society and pursue personal fulfillment. Key goals include fostering personal development, social responsibility, economic opportunity, cultural and global competence, and personal well-being. Education provides foundational skills, critical thinking, creativity, and ethics, promoting informed decision-making and problem-solving. It emphasizes social justice, environmental stewardship, and career readiness, equipping individuals with vocational skills and fostering lifelong learning. Additionally, education supports cultural understanding and global engagement, while also promoting personal health and emotional resilience. These objectives guide educational policies and practices to meet both individual aspirations and societal needs. Educators are vital in shaping students' learning experiences and outcomes. They provide instruction, guidance, and support, designing curricula that meet educational standards and student needs. By planning lessons and assessments, educators engage students in active learning and evaluate their progress through tests, quizzes, and projects. They offer constructive feedback to aid student growth and create a positive learning environment by fostering community and promoting positive behavior. Additionally, educators model ethical behavior and advocate for students' needs, collaborating with families and support services. They

pursue continuous professional development to refine their teaching skills and adapt to new instructional methods, using reflective practice to enhance their effectiveness and improve student achievement.

Lifelong learning is the ongoing pursuit of knowledge and personal development throughout life, spanning formal education, informal learning, and experiential opportunities. It fosters adaptability, intellectual curiosity, and continuous self-improvement. Key benefits include career advancement, personal enrichment, and enhanced social and cultural engagement. Lifelong learning supports technological integration, boosts job performance, and promotes personal growth by expanding knowledge and discovering new interests. It encourages individuals to reflect on their learning, set goals, and adapt to a rapidly changing world, making learning a transformative and integral part of their lives.

Global perspectives encompass an understanding of the diverse cultural, economic, political, environmental, and social dynamics of our interconnected world. They emphasize cultural sensitivity, cross-cultural communication, and global citizenship. This includes recognizing economic and political interdependence, advocating for environmental sustainability, and promoting social justice. Education for global citizenship fosters critical thinking and cultural competence, while media and information literacy involve analyzing global sources and understanding biases. Collaborative problem-solving is essential for addressing complex global challenges.

Educational challenges include ensuring access and equity, overcoming financial barriers, and advancing inclusive education. Curriculum adaptation is necessary for up-to-date teaching practices and assessments. Globalization requires integrating diverse perspectives while avoiding biases. Technological integration involves enhancing digital literacy and addressing privacy and cyber security concerns.

Education plays a crucial role in shaping individuals' abilities to interpret information and advance their knowledge. A well-educated person tends to be more aware of their rights and responsibilities, contributing to reduced societal conflicts and greater tolerance for diversity. For employers, academic achievement, especially among fresh graduates, is a significant criterion when assessing potential employees (Khan, Gul, & Zeb, 2023). Education equips individuals to navigate complex global challenges and enhances career opportunities. Academic performance significantly impacts career prospects and further educational pursuits, with metrics like cumulative grade point average (CGPA) serving as benchmarks for success (Talib & Sansgiry, 2012). Strong academic results are associated with better employment opportunities, higher incomes, and increased self-confidence (Tentama & Abdillah, 2019). Factors influencing academic success include initial performance, family support, living conditions, and proficiency in English (Kochhar, 2000). Socioeconomic factors, such as family income levels and teacher-student ratios, also impact outcomes. This study aims to model the CGPA of students at Riphah International University, Malakand Campus, identifying key factors affecting academic performance to provide insights for improvement.

Literature Review

Khan et al. (2023), examine factors affecting academic performance at Riphah International University, Malakand Campus, using CGPA as the metric. Key factors include HSSC grades, parental education, parental support, and classroom attention. Recommendations focus on improving student outcomes, particularly for those with less educated parents, and emphasize the importance of a supportive learning environment.

Noble, Roberts, and Sawyer (2006) highlight that strong communication skills are linked to improved academic performance and CGPA. Effective communication enhances comprehension, collaboration, engagement, and professional readiness, leading to a better understanding of concepts, productive teamwork, and efficient conflict resolution.

Abdullah's (2011) Study Active participation in class discussions enhances learning by encouraging critical thinking and deeper engagement with the subject matter. Strong communication skills are also crucial for networking, job interviews, and career advancement, as they help students build relationships with peers, professors, and professionals in their field. Therefore, universities and educational institutions often emphasize the development of these skills alongside academic knowledge to support overall student achievement.

Khan (2019) identifies factors affecting academic performance, including the examination system, family size, use of audio-visual aids, and living status. Exam formats influence preparation and performance, while family size affects resource allocation and support. Audio-visual aids enhance learning and engagement, and living status impacts time management and the study environment. Understanding these factors helps create supportive learning environments tailored to diverse student needs.

Khan and Irfan (2021) highlight that effective study habits, such as note-taking and regular review of class materials, significantly impact academic performance. Note-taking enhances retention and comprehension, while consistent review helps consolidate learning and identify gaps. These habits improve preparedness for assessments and reduce exam stress, positively correlating with academic success.

Khan and Irfan's (2021) study emphasizes the importance of study habits with academic performance, particularly focusing on two key habits: taking notes and reviewing class materials. These habits can significantly influence students' academic outcomes by promoting active learning, retention of information, comprehension of concepts, and preparedness for assessments. Khan et al. (2023) found a strong positive correlation between student cognitive engagement and academic success. Abou Naaj et al. (2023) highlighted that course categories, student attendance, and hybrid course delivery methods significantly affect academic performance. Hybrid delivery combines online and face-to-face elements, offering flexibility and enhancing engagement, which supports improved academic outcomes. Understanding these factors helps optimize learning for both educators and students.

Hasan et al. (2017) study found that students' attitude toward courses, self-motivation, and the teaching and learning process significantly impact their CGPA. Tabassum et al.'s study examined variables influencing classroom attendance and performance. Data from four universities was gathered through multiple regression analysis, supporting the beneficial effect of classroom attendance on student performance.

Zulauf and Gortner's studies (1999) and Chen and Lin's research highlight the importance of study time, time management, and attendance in enhancing students' academic performance. Zulauf and Gortner found a positive correlation between study time, effective time management, and academic achievement, as measured by quarterly CGPAs. They also found that investing adequate time in study and employing good time management skills can contribute to higher academic performance.

Chen and Lin (2008) found a significant positive correlation between attendance and exam performance, with regular attendance leading to a 9.4% to 18.0% increase in scores. This indicates that active learning, interaction, and discipline are vital for academic success, as consistent

attendance enhances engagement, understanding, and performance while reflecting a student's commitment and discipline.

Materials and Methods

Sampling

Sampling is a method where a predetermined number of observations are taken from a larger population to reduce the number of cases. This is more cost-effective than conducting a census, which involves studying every individual or item in a population. A well-designed sample can provide accurate and reliable information at a fraction of the cost. The process involves defining the target population, selecting the appropriate sampling frame, choosing the sampling technique, estimating the sample size, collecting data, and assessing the response rate.

Types of Sampling

The selection of a sampling method is crucial for ensuring a representative sample and generalizability of results to a larger group. It depends on factors like population nature, research questions, and available resources, and can be divided into two types. representative sample and generalizability of results to a larger group. It depends on factors like population nature, research questions, and available resources, and can be divided into two types.

Stratified Random Sampling

In estimation problems, the goal is to obtain an accurate estimator of a population parameter. For homogeneous populations, simple random sampling provides a good estimator of the population mean. However, for heterogeneous populations, stratified sampling is more effective. This method divides the population into homogeneous subpopulations and samples each stratum separately, enhancing estimator precision by reducing overall heterogeneity (Turner, 2020).

Multiple Linear Regression Model

Multiple linear Regression (MLR) is a statistical method that predicts a response variable using multiple explanatory variables. It extends ordinary least squares (OLS) regression, assuming a linear relationship between the dependent variable and each independent variable. The model is expressed mathematically as a function of these variables.

$$y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_p X_p + \epsilon \quad (1)$$

Multiple regressions are a statistical method that predicts one variable based on multiple explanatory variables, unlike linear regression, which only involves two continuous variables (one independent and one dependent). Multiple regressions extend this by incorporating several predictors to improve prediction accuracy.

The Assumption for Multiple Linear Regression Model

The multiple linear regression models are based on the following assumption we must first make sure that five assumptions.

Linear Relationship

Multiple regressions are a statistical method that predicts one variable based on multiple explanatory variables, unlike linear regression, which only involves two continuous variables (one independent and one dependent). Multiple Regressions extends this by incorporating several predictors to improve prediction accuracy.

Multicollinearity

The data should not exhibit Multicollinearity, as it indicates highly correlated explanatory variables. If the independent variables show Multicollinearity, it suggests a problem contributing to the variance of the dependent variables. The best statistical method to test this assumption is through regression models (Gujarati, 2004).

VIF (Variance Inflation Factor)

The variance inflation factor (VIF) is a statistical tool used to assess multicollinearity in regression. It measures how much an independent variable's behavior is inflated by its interaction and correlation with other variables. In cases of severe multicollinearity, the VIF is very large. Various methods are used to eliminate multicollinearity in identified variables. VIF values range from 1 to 5, with 1 indicating no correlation, 1 to 5 indicating moderate correlation, and 5 indicating highly correlation.

Independence

Time series data does not correlate with constative residuals, while longitudinal data sets collect observations from the same entity over time. Longitudinal data sets, like stock price data, are one-time-only data on entities. There are two types of data: cross-sectional data and longitudinal data. Longitudinal data can be analyzed using statistical methods like regression analysis, mixed effect model, and growth curve model. Cross-sectional data only collects information on entities once.

Autocorrelation

Autocorrelation may be defined as "Correlation between members of a series of observations ordered in time [as in time series data] or space [as in cross-sectional data]" is one definition of the term autocorrelation. The standard linear regression model in the context of regression presupposes the absence of such autocorrelation in the disturbances μ_i . Simply put, the classical model holds that the disturbance term associated with any given observation is unaffected by the disturbance term associated with any other observation (Gujarati, 2004).

Data Description

This section discusses the population, sampling technique, and sample size of our study.

Study Area Description

The study was conducted at the University of Peshawar Khyber Pakhtunkhwa (KPK) Pakistan.

Data Collection Tools

The University of Peshawar collected data through stratified random sampling, where students were selected from each academic department using an equal allocation method.

Questionnaire

A questionnaire was developed for data collection at Peshawar University, with consent signed by all individuals. Simple and easy-to-understand language was used, with possible answers provided for respondents to choose their preferred response. The workplace academics performance questionnaire was used for these methods.

Population and Samples

This study surveyed current BS students at the all-Department University of Peshawar, Pakistan, focusing on all 49 departments with good academic performance, excluding subjects considered as subjects.

Results and Discussion

Methodology and Demographics

The study utilized rigorous Stratified Random Sampling to gather data from a representative sample of 530 undergraduate students across 49 departments. This method ensured a balanced representation of students from various academic backgrounds. Among them, 63 (58.3%) were male and 45 (41.7%) were female. The age distribution highlighted a majority in the 18-22 age range, with a notable segment above 22 years old.

Academic Performance and CGPA

The cornerstone of academic assessment was the Cumulative Grade Point Average (CGPA), revealing a trend where female students consistently outperformed their male counterparts. Notably, over 63.3% of students achieved above-average scores in their last examination, indicating a robust academic performance overall.

Influence of Parental Education

Parental education emerged as a pivotal factor influencing student achievement. The majority of parents had educational backgrounds up to matric or intermediate levels, with a significant impact on their children's academic outcomes. Research consistently shows that higher parental education correlates with higher student CGPAs, underscoring the critical role of family educational backgrounds in academic success.

Critical Factors Affecting Academic Success

Several key factors were identified as crucial determinants of academic success.

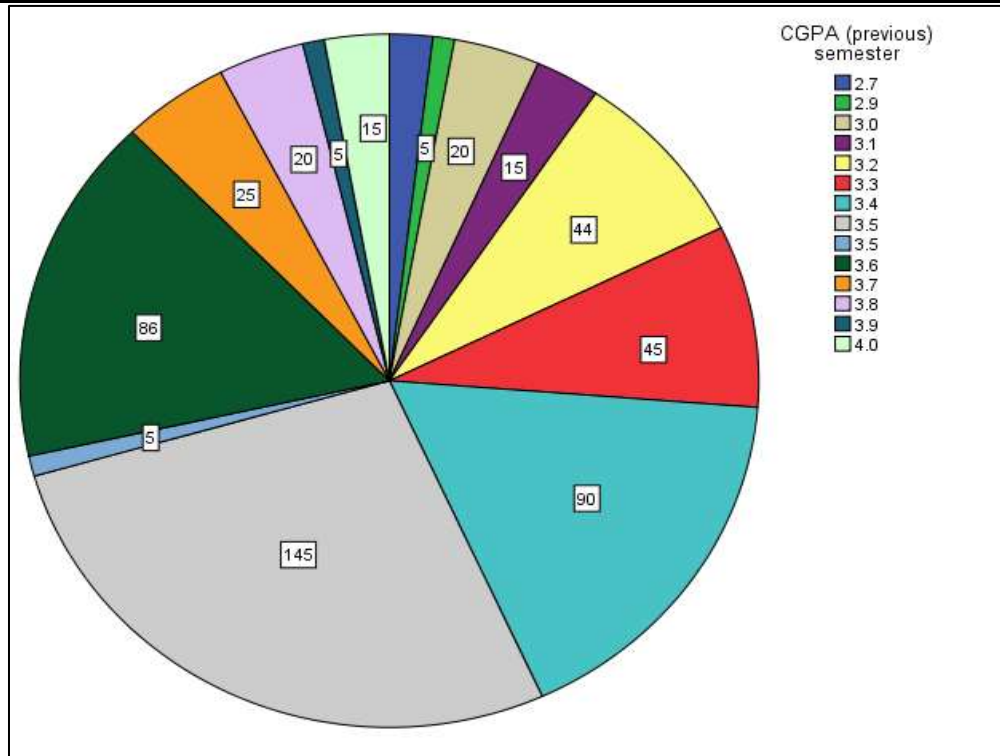
Attention in Class

The ability to focus and concentrate in class emerged as a critical determinant of academic performance. Students who actively engaged and minimized distractions showed higher CGPAs.

Financial Support

Adequate financial backing from parents was identified as essential. It alleviates financial stress, allowing students to focus more on their studies and less on economic concerns, thereby enhancing their academic outcomes.

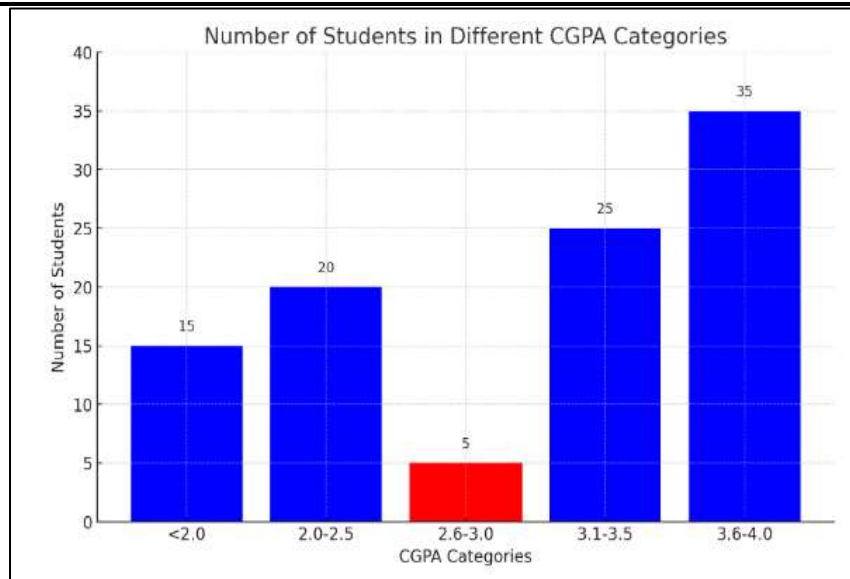
Figure 1: GPA previous semester



Overview of the Pie Chart

The pie chart represents the distribution of students' CGPAs from the previous semester. Each segment is labeled with the CGPA range and the number of students within that range. The size of each segment visually depicts the proportion of students in that CGPA range.

Figure 2: Number of students across different CGPA categories



CGPA 2.7 (Dark Green)

The bar graph above illustrates the number of students across different CGPA categories. The category "2.6-3.0" (which includes a CGPA of 2.7) is highlighted in red, showing that only a few students (5) fall into this range. This highlights that a CGPA of 2.7 is relatively uncommon among students.

CGPA of 2.9 (Light Green)

The data reveals that 15 students have achieved a CGPA of 2.9, indicated by the color light green. This represents a small proportion of the student population, slightly exceeding the number of students with a 2.7 CGPA. Despite this, the 2.9 CGPA still constitutes a minority within the overall academic distribution. The relatively modest number of students in this range suggests that while it is somewhat more common than the 2.7 CGPA, it remains a less frequent achievement level compared to higher CGPA ranges. This trend highlights a specific performance tier that, although slightly more prevalent than some lower ranges, is still limited in its representation within the student body.

CGPA 3.0 (Yellow-Green)

The data indicates that 5 students have achieved a CGPA of 3.0, represented by the color yellow-green. This figure represents a very small proportion of the student population, making it a relatively uncommon score. The low number of students with a 3.0 CGPA suggests that this level of achievement is similar in rarity to the 2.7 CGPA range. This trend highlights that, like the 2.7 CGPA, the 3.0 CGPA is less prevalent among the student body, reflecting a smaller segment of academic performance that is not widely distributed within the overall student population.

CGPA 3.1 (Teal)

The data shows that 5 students have achieved a CGPA of 3.1, indicated by the color teal. This represents a very small proportion of the student population, making it a relatively rare score among the students. The low number of students in this category suggests that it is less common compared to higher CGPA ranges. This trend reflects a smaller segment of academic performance within the student body, indicating that few students fall into this particular achievement level. As a result, the 3.1 CGPA is notable for its infrequency and signifies a less prevalent performance tier.

CGPA 3.2 (Light Yellow)

The data reveals that 20 students have achieved a CGPA of 3.2, represented by the color light yellow. This number constitutes a small to moderate proportion of the student population. While it is a larger segment compared to the groups with CGPAs of 2.7, 2.9, 3.0, and 3.1, it still does not represent a major segment of the overall student body. This range indicates that although there is a noticeable concentration of students performing at this level, it remains relatively modest in comparison to higher CGPA categories. The trend highlights a distinct performance tier that is more prevalent than some lower ranges but is not among the largest segments of academic achievement.

CGPA 3.3 (Purple)

The data shows that 15 students have achieved a CGPA of 3.3, denoted by the color purple. This represents a small proportion of the student population, similar in size to the group with a 2.9

CGPA. The relatively limited number of students in this range indicates that this CGPA level is less common among the student body. Although it is not among the more frequent performance levels, it still forms a recognizable segment of the academic distribution. This trend highlights a specific segment of academic achievement that, while less prevalent, contributes to the overall diversity of CGPA levels within the student body.

CGPA 3.4 (Beige)

The data indicates that 20 students have achieved a CGPA of 3.4, denoted by the color beige. This represents a small to moderate proportion of the student population, aligning closely with the size of the group with a 3.2 CGPA. The relatively modest number of students in this range suggests that while it is not among the most common CGPA levels, it still constitutes a notable segment of the student body. This trend reflects a level of academic performance that is less frequent than higher CGPA ranges but still significant within the overall distribution of grades.

CGPA 3.5 (Orange)

The data shows that 25 students have achieved a CGPA of 3.5, represented by the color orange. This constitutes a moderate proportion of the student population, indicating that this performance range is more common compared to some of the previous groups with lower student counts. While not as prevalent as higher CGPA ranges, the number of students with a 3.5 CGPA is notable, reflecting a significant level of academic achievement. This moderate proportion highlights a considerable segment of the student body performing at this level, underscoring the diversity of academic performance among the students.

CGPA 3.6 (Green)

The data reveals that 86 students have achieved a CGPA of 3.6, indicated by the color green. This number represents a large proportion of the student population, positioning it as one of the more substantial segments in terms of academic performance. The significant number of students within this CGPA range highlights a considerable concentration of achievement at this level, making it one of the more common performance tiers among the student body. This trend suggests that a notable segment of students is performing well, contributing to a broad distribution of academic success across varying levels of achievement.

CGPA 3.7 (Light Blue)

The data indicates that only 5 students have achieved a CGPA of 3.7, represented by the color light blue. This figure constitutes a very small proportion of the total student population, making it comparable to the smallest segments of academic performance. The limited number of students with a 3.7 CGPA suggests that it is an uncommon achievement among the students, indicating fewer individuals fall into this lower tier compared to higher CGPA ranges. This relatively minor representation highlights the concentration of students in higher CGPA ranges and underscores the rarity of this particular performance level.

CGPA 3.8 (Gray)

The data shows that 145 students have achieved a CGPA of 3.8, indicated by the color gray. This represents the largest proportion of the student population, making it the most common CGPA range among the students. The high number of students with a 3.8 CGPA suggests a concentration of performance around this score, highlighting it as the most prevalent level of academic

achievement. This trend points to a significant cluster of students performing at a high level, which may reflect a strong general academic capability within the student body and a common benchmark of success.

CGPA 3.9 (Light Blue)

The data reveals that 90 students have achieved a CGPA of 3.9, represented by the color light blue. This figure constitutes a large proportion of the student population, indicating that a significant segment of students fall into this category. The substantial number of students with a 3.9 CGPA reflects a strong performance level, positioning it as the second-largest segment of academic achievement. This trend suggests that many students are performing exceptionally well, just below the highest possible CGPA, and underscores a high overall standard of academic excellence within the student body.

CGPA 4.0 (Yellow)

Among the students, 44 individuals achieved the highest possible CGPA of 4.0. This represents a moderate to large proportion of the student population, indicating that a significant number of students attained the top grade. Such a substantial number of high achievers suggests a positive trend in academic performance, reflecting either effective teaching practices, strong student dedication, or both. This achievement highlights the exceptional performance within the student body and underscores the overall quality of the educational environment.

Table 1: CGPA (previous)semester

	Frequency	Percent	Valid Percent	Cumulative Percent
3	10	1.9	1.9	1.9
3	5	.9	.9	2.8
3	20	3.8	3.8	6.6
3	15	2.8	2.8	9.4
3	45	8.5	8.5	17.9
3	45	8.5	8.5	26.4
3	90	17.0	17.0	43.4
4	145	27.4	27.4	70.8
4	5	.9	.9	71.7
4	85	16.0	16.0	87.7
4	25	4.7	4.7	92.5
4	20	3.8	3.8	96.2
4	5	.9	.9	97.2
4	15	2.8	2.8	100.0
Total	530	100.0	100.0	

Table 1 illustrates the distribution of students' CGPAs from the previous semester, detailing frequency, percentage, valid percentage, and cumulative percentage for each CGPA category. Starting with the CGPA category of 3, there are 10 students (1.9% of the total), followed by smaller groups with 5 students each (0.9%). More students fall into the 3.2 to 3.3 CGPA range, with frequencies of 20 (3.8%) and 15 (2.8%). The 3.4 and 3.5 CGPA categories have significantly higher frequencies, both at 45 students (8.5%), and the largest within the 3 category is 90 students (17.0%), making up 43.4% cumulatively. Transitioning to the 4 CGPA category, the most

significant group is at the 4.0 level with 145 students, constituting 27.4% of the total. This is followed by smaller groups, such as 5 students (0.9%), and another significant group of 85 students (16.0%). The 4.5 and 4.6 categories have frequencies of 25 (4.7%) and 20 (3.8%), respectively. The distribution concludes with smaller groups of 5 students (0.9%) and 15 students (2.8%), bringing the cumulative percentage to 100%. Overall, the table shows a higher concentration of students with CGPAs in the upper range, particularly around 4.0, indicating a generally strong academic performance among the students. The cumulative percentage reinforces this, with 70.8% of students having CGPAs in the higher end of the scale.

Table 2: Obtain Marks in the Current Semester

Valid	Frequency	Percent	Valid Percent	Cumulative Percent
230	5	.9	.9	.9
320	5	.9	.9	1.9
330	5	.9	.9	2.8
336	5	.9	.9	3.8
337	5	.9	.9	4.7
340	10	1.9	1.9	6.6
341	5	.9	.9	7.5
342	5	.9	.9	8.5
345	5	.9	.9	9.4
350	10	1.9	1.9	11.3
354	5	.9	.9	12.3
358	10	1.9	1.9	14.2
360	5	.9	.9	15.1
365	5	.9	.9	16.0
367	15	2.8	2.8	18.9
369	5	.9	.9	19.8
370	10	1.9	1.9	21.7
371	5	.9	.9	22.6
372	5	.9	.9	23.6
374	5	.9	.9	24.5
375	5	.9	.9	25.5
378	5	.9	.9	26.4
379	5	.9	.9	27.4
380	5	.9	.9	28.3
381	5	.9	.9	29.2
384	5	.9	.9	30.2
385	10	1.9	1.9	32.1
386	5	.9	.9	33.0
390	10	1.9	1.9	34.9
392	5	.9	.9	35.8
393	15	2.8	2.8	38.7
394	5	.9	.9	39.6
395	10	1.9	1.9	41.5
396	5	.9	.9	42.5

398	10	1.9	1.9	44.3
400	25	4.7	4.7	49.1
401	5	.9	.9	50.0
404	5	.9	.9	50.9
407	10	1.9	1.9	52.8
409	10	1.9	1.9	54.7
410	15	2.8	2.8	57.5
411	5	.9	.9	58.5
412	5	.9	.9	59.4
413	5	.9	.9	60.4
415	15	2.8	2.8	63.2
416	5	.9	.9	64.2
417	5	.9	.9	65.1
419	5	.9	.9	66.0
420	5	.9	.9	67.0
425	5	.9	.9	67.9
427	10	1.9	1.9	69.8
430	5	.9	.9	70.8
432	10	1.9	1.9	72.6
435	10	1.9	1.9	74.5
439	5	.9	.9	75.5
440	10	1.9	1.9	77.4
441	5	.9	.9	78.3
443	10	1.9	1.9	80.2
444	5	.9	.9	81.1
450	15	2.8	2.8	84.0
454	5	.9	.9	84.9
455	5	.9	.9	85.8
456	15	2.8	2.8	88.7
458	5	.9	.9	89.6
465	10	1.9	1.9	91.5
474	10	1.9	1.9	93.4
475	5	.9	.9	94.3
480	5	.9	.9	95.3
485	5	.9	.9	96.2
495	5	.9	.9	97.2
499	5	.9	.9	98.1
559	5	.9	.9	99.1
765	5	.9	.9	100.0
Total	530	100.0	100.0	

The data provided represents the distribution of students' marks in the current semester at Students University of Peshawar. It includes the frequency, percentage, valid percentage, and cumulative percentage for each mark category. The total number of students is 530. The marks range from 230 to 765, with each mark value's frequency and corresponding percentages noted. For instance,

five students each scored 230, 320, 330, and other similar marks, which corresponds to 0.9% of the total for each of those scores. Some marks, like 340, 350, and others, have higher frequencies, indicating that more students scored these marks. The highest frequency is observed for the mark 400, where 25 students scored this, making up 4.7% of the total. As the cumulative percentage progresses, it shows the proportion of students who scored up to and including a certain mark. For example, by the mark 400, 49.1% of students have been accounted for. The cumulative percentage reaches 100% with the highest mark of 765, scored by 5 students. This distribution shows that the marks are quite spread out, with small clusters at certain points, indicating variations in student performance.

Table 3: Total Marks Of CGPA

Valid	Frequency	Percent	Valid Percent	Cumulative Percent
500	530	100.0	100.0	100.0

The data indicates that the total marks considered for calculating the CGPA at the University of Peshawar, are 500. This means that each student's CGPA is based on a total of 500 marks. The table shows that all 530 students have their CGPA calculated from this uniform total, as indicated by the frequency and percentages. Specifically, 100% of the students have their CGPA based on these 500 total marks, ensuring consistency and comparability in academic performance evaluation across the student body.

Table 4: Total Marks HSSC

Valid	Frequency	Percent	Valid Percent	Cumulative Percent
1100	530	100.0	100.0	100.0

The data reveals that the total marks for the Higher Secondary School Certificate (HSSC) at the University of Peshawar, are standardized at 1100. This means that all students' HSSC scores are measured out of a total of 1100 marks. The table shows a frequency of 530, indicating that all 530 students have their HSSC marks based on this total. The percentages confirm that 100% of the students have their HSSC marks evaluated out of 1100, ensuring uniformity in the assessment of prior academic performance.

Table 5: Gender

Valid	Frequency	Percent	Valid Percent	Cumulative Percent
Female	225	42.5	42.5	42.5
MALE	305	57.5	57.5	100.0
Total	530	100.0	100.0	

The data provides a breakdown of the gender distribution among students at the University of Peshawar. A graph depicting this information would show two categories: female and male. In the graph, the "male" category would be represented with a larger segment, showing 57.5% of the total student population, which equates to 305 students. This proportion reflects a higher number of male students compared to female students. Conversely, the "female" category would be represented with a smaller segment, accounting for 42.5% of the total, or 225 students. The graph would clearly illustrate that there are more male students than female students, with the total

number of students being 530. The cumulative percentage reaches 100% with the inclusion of both genders, ensuring that the entire student population is represented.

Table 6: Educational status of your parents

		Frequency	Percent	Valid Percent	Cumulative Percent	
Valid	0	150	28.3	28.3	28.3	
	no formal education	15	2.8	2.8	31.1	
	4	35	6.6	6.6	37.7	
	5	15	2.8	2.8	40.6	
	6	5	.9	.9	41.5	
	8	30	5.7	5.7	47.2	
	9	5	.9	.9	48.1	
	10	100	18.9	18.9	67.0	
	12	50	9.4	9.4	76.4	
	14	70	13.2	13.2	89.6	
	16	50	9.4	9.4	99.1	
	18	5	.9	.9	100.0	
	Total		530	100.0	100.0	

The educational status of parents among the 530 students surveyed varies widely. A small percentage of parents have no formal education (2.8%), while the majority have achieved varying levels of formal schooling. Specifically, 6.6% of parents have received 4 years of education, and 2.8% have 5 years. Fewer parents have 6 years (0.9%) or 9 years (0.9%) of education, while 5.7% have completed 8 years. The largest proportion of parents, 18.9%, have attained 10 years of education. Additionally, 9.4% of parents have completed 12 years, 13.2% have 14 years, and another 9.4% have 16 years of education. Finally, 0.9% of parents have achieved 18 years of education. The cumulative distribution indicates that most parents have at least 10 years of education, with a notable proportion having 14 years or more.

Table 7: Financially parents support your Accommodation of University

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Some time	70	13.2	13.3	13.3
	Yes	450	84.9	85.7	99.0
	No	5	.9	1.0	100.0
	Total	525	99.1	100.0	
Missing	System	5	.9		
Total		530	100.0		

The data on parental financial support for university accommodation reveals a clear trend. A significant majority of parents, 84.9%, consistently provide financial assistance for their children's accommodation. This reflects strong support from most families in covering these expenses. Additionally, 13.2% of parents offer financial support occasionally, suggesting that while these families may not always provide help, they still contribute at times. In contrast, only 0.9% of

parents do not provide any financial support for accommodation, indicating that such cases are relatively rare. Overall, the data demonstrates that the vast majority of students receive financial aid from their parents for housing, with only a small percentage lacking this support.

Table 8: Members Family

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	6 to 9	5	.9	.9	.9
	more than 9	5	.9	.9	1.9
	4	15	2.8	2.8	4.7
	5	35	6.6	6.6	11.3
	6	55	10.4	10.4	21.7
	7	60	11.3	11.3	33.0
	8	95	17.9	17.9	50.9
	9	55	10.4	10.4	61.3
	10	60	11.3	11.3	72.6
	11	15	2.8	2.8	75.5
	12	35	6.6	6.6	82.1
	13	25	4.7	4.7	86.8
	14	20	3.8	3.8	90.6
	15	15	2.8	2.8	93.4
	16	10	1.9	1.9	95.3
	20	5	.9	.9	96.2
	22	5	.9	.9	97.2
	25	5	.9	.9	98.1
	70	5	.9	.9	99.1
98	5	.9	.9	100.0	
	Total	530	100.0	100.0	

Table 8 distribution of family sizes among the 530 students surveyed shows considerable variation. The most common family sizes fall between 6 and 10 members. Specifically, 17.9% of families have 8 members, and 11.3% each have 7 or 10 members. Other prevalent family sizes include 6 members (10.4%), 9 members (10.4%), and 5 members (6.6%). Smaller and larger families are less common, with only a few families having between 6 and 9 members or exceeding 20 members. For instance, 5 families each have 22, 25, 70, or 98 members, representing the extremes of family size. Overall, the data indicates that most students come from families with a moderate number of members, with a significant proportion of families having 8 to 10 members.

Table 9: Phones, Chatting and playing game in university

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	210	39.6	40.0	40.0
	No	125	23.6	23.8	63.8
	some time	190	35.8	36.2	100.0
	Total	525	99.1	100.0	
Missing	System	5	.9		
Total		530	100.0		

The data on phone usage for chatting and playing games at the university reveals varied patterns among students. A substantial 40.0% of students use their phones for these activities regularly, indicating a significant level of engagement with their phones during university hours. Meanwhile, 36.2% of students use their phones for chatting and playing games occasionally, suggesting that phone usage is a frequent but not constant part of their university experience. Conversely, 23.8% of students do not engage in these activities with their phones while at the university, highlighting a smaller group who either refrain from or limit their phone usage. Overall, the data demonstrates that while a majority of students are actively using their phones for chatting and gaming, a notable portion of students either use their phones less frequently or avoid these activities during their university time.

Table 10: Lecture During Classes

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	65	12.3	12.3	12.3
	1	380	71.7	71.7	84.0
	2	85	16.0	16.0	100.0
	Total	530	100.0	100.0	

The data on lecture attendance during classes shows that the majority of students are actively participating in their classes. A significant 71.7% of students attend one lecture during their class time, indicating that most students are engaged with at least one lecture per class. Additionally, 16.0% of students attend two lectures, reflecting a smaller but still notable portion who are involved in more than one lecture. Only 12.3% of students do not attend any lectures during class time, representing a minority who may not be participating as actively. Overall, the data suggests that the majority of students are consistently attending lectures, with a small percentage engaging in multiple lectures or not attending at all.

Table 11: Participate in the Discussion During a lecture

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	15	2.8	2.8	2.8
	No	360	67.9	67.9	70.8
	some time	155	29.2	29.2	100.0
	Total	530	100.0	100.0	

The data on student participation in discussions during lectures highlights a trend of varying engagement levels. A small percentage, just 2.8%, actively participate in discussions during lectures. This indicates that only a few students are consistently involved in class discussions. In contrast, a significant majority of 67.9% do not participate in discussions at all, suggesting that most students tend to remain passive during these interactions. Additionally, 29.2% of students participate in discussions occasionally, showing that a notable portion of the student body engages in discussions from time to time but not regularly. Overall, the data reveals that while a few students are actively engaged in discussions, most either do not participate or only do so sporadically.

Table 12: Study problems such as, Anxiety, Oblivion, Lack of Sleep and Laziness

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2 to 4	225	42.5	42.5	42.5
	more than 8	130	24.5	24.5	67.0
	5 to 7	175	33.0	33.0	100.0
	Total	530	100.0	100.0	

The data on study-related problems such as anxiety, forgetfulness, lack of sleep, and laziness reveals a range of challenges faced by students. A substantial 42.5% of students report experiencing these issues 2 to 4 times, indicating a moderate frequency of these problems. In addition, 33.0% of students face these challenges 5 to 7 times, reflecting a higher level of difficulty in managing their study-related issues. A notable 24.5% of students experience these problems more than 8 times, which points to severe and frequent struggles. Overall, the data shows that while many students encounter these issues occasionally, a significant proportion deal with them either frequently or very often, highlighting the pervasive nature of these study-related problems.

Table 13: Daily Notes of the Lectures

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	85	16.0	16.2	16.2
	No	340	64.2	64.8	81.0
	some time	100	18.9	19.0	100.0
	Total	525	99.1	100.0	
Missing	System	5	.9		
Total		530	100.0		

The data on students' practices regarding daily note-taking during lectures shows a significant variance in habits. A minority of 16.2% of students consistently take notes daily, indicating that only a small portion maintain this practice regularly. Conversely, a substantial 64.8% of students do not take notes daily, suggesting that note-taking is not a common practice among most students. Additionally, 19.0% of students take notes only occasionally, reflecting a moderate engagement with note-taking that is not consistent. Overall, the data indicates that while a few students adhere to daily note-taking, the majority either do not engage in this practice regularly or do so only sporadically.

Table 14: Number of Days Absent in a Week

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	34	5	.9	.9	.9
	35	5	.9	.9	1.9
	39	5	.9	.9	2.8
	45	5	.9	.9	3.8
	48	5	.9	.9	4.7
	51	5	.9	.9	5.7

58	5	.9	.9	6.6
60	5	.9	.9	7.5
65	25	4.7	4.7	12.3
66	10	1.9	1.9	14.2
67	5	.9	.9	15.1
68	10	1.9	1.9	17.0
69	5	.9	.9	17.9
70	80	15.1	15.1	33.0
71	10	1.9	1.9	34.9
72	10	1.9	1.9	36.8
73	10	1.9	1.9	38.7
74	35	6.6	6.6	45.3
75	60	11.3	11.3	56.6
76	10	1.9	1.9	58.5
77	15	2.8	2.8	61.3
78	30	5.7	5.7	67.0
79	15	2.8	2.8	69.8
80	80	15.1	15.1	84.9
82	5	.9	.9	85.8
85	5	.9	.9	86.8
90	20	3.8	3.8	90.6
91	5	.9	.9	91.5
92	10	1.9	1.9	93.4
93	5	.9	.9	94.3
94	5	.9	.9	95.3
95	10	1.9	1.9	97.2
98	15	2.8	2.8	100.0
Total	530	100.0	100.0	

The data on the number of days students are absent from university in a week reveals a diverse range of absenteeism. A significant portion of students, 15.1%, are absent for 70 days, which represents a considerable amount of time away from their studies. Another 15.1% are absent for 80 days, indicating that these students also experience extensive absenteeism. Additionally, 11.3% of students are absent for 75 days, showing another notable group with frequent absences. A range of smaller percentages of students are absent for various other durations. For instance, 6.6% are absent for 74 days, and 5.7% are absent for 78 days. Other absence durations are less common, with smaller percentages reported for 34, 35, 39, and 45 days, among others. Overall, the data illustrates that while some students face relatively high levels of absenteeism, ranging from 70 to 80 days, others have varied but generally lower frequencies of absence. The distribution suggests a significant variability in attendance patterns, with a notable number of students experiencing extended periods of absenteeism.

Table 15: ANOVA Table

Model		Sum of Squares	D.F	Mean Square	F	Sig.
1	Regression	8.456	7	1.208	31.410	.000 ^b
	Residual	19.883	517	.038		
	Total	28.338	524			

The ANOVA provides an analysis of variance for the regression model used in the study. The table shows that the Regression model has a Sum of Squares of 8.456, with 7 degrees of freedom (df), and a Mean Square of 1.208. The F-statistic for the model is 31.410, which is highly significant with a p-value (Sig.) of .000. This indicates that the regression model explains a significant amount of the variability in the dependent variable, suggesting a strong overall fit of the model. On the other hand, the Residual sum of squares is 19.883 with 517 degrees of freedom, and the Mean Square for the residuals is .038. The Total sum of squares, which represents the total variability in the data, is 28.338 with 524 degrees of freedom. Overall, the high F-value and low p-value suggest that the regression model is statistically significant and that the independent variables collectively have a significant impact on the dependent variable.

Table 16: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.154	.080		39.403	.000
	HSSC Obtain marks	.000	.000	.215	5.645	.000
	Your father income is Pakistani rupees	3.396E-7	.000	.246	6.291	.000
	Financially parents support your accommodation of university	-.061	.024	-.094	-2.520	.012
	Your attention in a class during a lecture	-.066	.018	-.147	-3.617	.000
	Are you try to solve the tutorial questions before in the classes.	.074	.014	.212	5.219	.000
	Does your university have specific place for study	.108	.017	.246	6.291	.000
	How much time you spend study every day.?	-.118	.017	-.256	-6.741	.000

a. Dependent Variable: CGPA (previous)semester

The coefficients table provides a detailed examination of how various factors influence students' CGPA from the previous semester:

Constant (B = 3.154, p < .001)

The constant term represents the estimated CGPA when all independent variables are zero. Its significance indicates that the baseline CGPA is statistically robust.

HSSC Obtain Marks (B = .000, Beta = .215, p < .001)

The positive standardized coefficient indicates that better marks in HSSC exams are associated with a higher CGPA. This relationship is statistically significant, suggesting that HSSC performance has a meaningful impact on academic success in university.

Father's Income (B = 3.396E-7, Beta = .246, p < .001)

The positive coefficient shows that higher paternal income is associated with a higher CGPA. This significance implies that financial resources may provide advantages that contribute to better academic performance, possibly through access to educational resources or reduced financial stress.

Financial Support for Accommodation (B = -.061, Beta = -.094, p = .012)

The negative coefficient indicates that financial support for accommodation is inversely related to CGPA. This might suggest that students receiving this support could face distractions or lack motivation, though the exact mechanism would need further exploration.

Attention in Class (B = -.066, Beta = -.147, p < .001)

The negative relationship signifies that less attention during lectures correlates with a lower CGPA. This emphasizes the importance of active engagement and participation in class for academic success.

Effort in Solving Tutorial Questions (B = .074, Beta = .212, p < .001)

The positive coefficient indicates that students who make an effort to solve tutorial questions before classes tend to achieve a higher CGPA. This suggests that proactive learning and preparation are beneficial for academic performance.

Presence of a Study Place at the University (B = .108, Beta = .246, p < .001)

The positive impact of having a designated study area implies that access to a conducive study environment supports better academic outcomes. This is significant, highlighting the role of physical study resources in achieving academic success.

Time Spent Studying Daily (B = -.118, Beta = -.256, p < .001)

The negative coefficient indicates that spending excessive time studying is associated with a lower CGPA. This may point to inefficiencies in study methods or potential burnout, suggesting that quality of study time might be more important than quantity. Overall, the results underscore that HSSC marks, parental income, study habits, and the availability of study resources significantly impact CGPA. However, some factors such as financial support for accommodation and excessive study time have a negative effect, indicating that these aspects could detract from academic performance under certain conditions.

Conclusion

This study provides a comprehensive examination of the factors that influence academic performance among undergraduate students at the University of Peshawar. Utilizing stratified random sampling and Multiple Linear Regression (MLR), the research identified several critical determinants of academic success. A significant finding of the study is the consistent outperformance of female students compared to their male counterparts in terms of Cumulative Grade Point Average (CGPA). With over 63.3% of students achieving above-average scores in their last examination, the results indicate a generally strong academic performance across the student body. Parental education emerged as a particularly influential factor in determining academic success. The study found that students whose parents had higher educational backgrounds were more likely to achieve higher CGPAs. This underscores the importance of the educational environment at home and suggests that parents' educational attainment can have a profound impact on their children's academic outcomes. The study also highlights the role of financial support from parents, which was shown to alleviate financial stress and allow students to focus more on their studies. This finding suggests that financial stability plays a crucial role in enabling students to achieve their full academic potential. Another key finding is the importance of classroom attention. Students who were more attentive in class consistently achieved higher CGPAs, emphasizing the critical role that active engagement and participation play in academic success. This suggests that efforts to improve student focus and reduce classroom distractions could have a significant impact on academic outcomes. Additionally, the study found that students who made an effort to solve tutorial questions before class were more likely to achieve higher CGPAs, indicating that proactive learning and preparation are beneficial to academic performance. The study also revealed the significance of the study environment, particularly the availability of a designated study space within the university. Students with access to such environments tended to perform better academically, highlighting the importance of providing students with the resources they need to succeed. Interestingly, the study also found that excessive time spent studying was associated with lower CGPAs. This suggests that while study time is important, the quality of study is more critical than the quantity. Inefficient study methods or potential burnout may contribute to lower academic performance despite longer study hours. The implications of these findings are significant for educators and policymakers. The study suggests that targeted strategies to support students, particularly those from less educated families, could help bridge the academic performance gap. Improving access to financial support, fostering effective study habits, and ensuring that students have access to conducive study environments are all important steps toward enhancing academic outcomes. Furthermore, the study highlights the need for interventions that focus on improving student engagement and attention in the classroom, as these factors are closely linked to academic success.

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