Significance of Living Near University on Academic Performance: A Quantitative Research

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1 Abstract

The proximity of one's living place to their university or educational institution has a significant impact on their academic performance, learning quality, and results. Living near one's educational institution provides students with quick access to campus facilities, faculty consultations, resources, and other opportunities, potentially impacting the overall performance of a student. This research investigates the correlation between residential proximity and academic performance, considering key factors such as time consumption on the road and ease of access to university resources. The aim is to provide insights on whether students' living arrangements influence academic success.

Keywords: Proximity to University, Academic Performance

2 Introduction

Having a residence far from the university sometimes consumes a lot of valuable time on the roads. Traffic jams are a major problem in a developing country like Bangladesh. The busy roads cost hours on the buses and cars where people sit uselessly. According to Rahman's report on *The Daily Star* [1], 28% of the population are youth, and most of them are school, college, or university-going students.

Everyone will agree on the fact of how precious time is for a student. Many students who live far from the university think that this loss of time makes a huge difference in their academic results compared to those who reside near the university. On the contrary, the people who live near the institutions are mostly bachelor students whose family lives outside the city. Although they have ease of access to the university resources, they often feel depression, loneliness, and anxiety as they do not have guardians. This can also influence their academic performance.

Besides, one can still perform well in their academics even after living far from the university. So, one cannot state that living near a university has a significant impact

on academic performance based on their personal opinion. To clarify this, Turley and Wodkey [2] conducted a study on this and concluded that students living on campus are generally more advantaged, but overall, residence proximity is not a significant predictor of CGPA, quantitative results.

Our research exactly intends to fill the purpose to investigate and verify the hypothesis. As this is a quantitative analysis, the result can be either accepting the null hypothesis or rejecting the null hypothesis by accepting the alternative hypothesis. We will perform some tests on our collected dataset to reach the conclusion.

3 Literature Review

There are several benefits to a student attending a university far from home. One of these benefits is that the student's intellectual capacity will grow, making him more self-sufficient and capable of solving problems much more quickly. But every situation contains both positive and negative aspects, just like every coin. Similarly, living alone without any kind of disruption enhances the likelihood that a person would do well academically, which will lead to positive outcomes. You won't have to waste time travelling because everything you need, including the library, classes, and student activities, will be close by. This allows you to spend more time with friends, study, and join clubs. This also can reduce transportation expenses, which can save a lot of money for students on a tight budget. Living close to other students near the university also makes you feel more connected and helps you form friendships that last. It's the ideal place to fully enjoy university. According to a researcher, one of the main determinants of a student's decision to attend a university is whether it is within commuting distance [3]. Moreover, compared to students who live farther away, students who live within commuting distance of a university have much greater university participation rates. A study found that students who live 40 kilometres or less from a university are almost double as likely to attend compared to those who live more than 80 kilometres away [3]. Additionally, students from families with less income might not be able to pay for the additional expenses of transportation. These students have fewer options when there are no colleges or universities in the area, which makes pursuing higher education more difficult [4]. Furthermore, according to another researcher, students who grow up close to a university, surrounded by friends and neighbours who either attend or work there, might consider university life as a part of their future [5]. Part-time campus employment options may also be available if you live close to the university. Students can find employment at many universities in administrative offices, cafes, and libraries. Moreover, shorter commutes help students allocate more time to their studies and personal growth, which can result in higher grades [5].

The purpose of this research is to investigate how students' academic performance is impacted by distance from where they live to the university, how they travel, their study schedules, and the kind of accommodations they take. This study shows the factors that have the greatest impact on students' academic performance. Students' academic performance may or may not be impacted by distance. We'll try to reveal it. Which may help universities and students in developing more effective academic achievement plans.

4 Theoretical Framework

- **Independent Variables:** Distance of university from home
- **Dependent variables:** Academic performance

This study suggests the following Hypothesis:

- Null Hypothesis (H_0): Living near a university has no significant impacts academic performance.
- Alternative Hypothesis (H_1): Living near a university has significant effect on academic performance.

5 Methodology

Coming to the most vital part of our study. This part will describe the methods by which we will reach our conclusions. The methods that will be used will be quantitative. Because only quantitative data analysis can be proved appropriate to comment on the hypothesis. At first, we collected data through Google Forms from people who are university going students. There are a variety of age groups in our dataset that will make our research more reliable. So, after the dataset is ready, we optimise the data by preprocessing. Meaning, we converted the string data points into some meaningful quantitative value. The phenomenon is "Deductive" because we first constructed our theoretical framework and hypothesis, and based on the construction, we selected the strategies by which we can test our hypothesis. We used simple random choices to have equal chances. Then, we deducted the duplicate rows and null values. After this, we plotted a correlation matrix to see the strong correlations and take our decision for strategy choosing. We also checked the skew graph to examine the skewness of the dataset. After the preprocessing is done, we performed the T-test, Chi-Square test, ANOVA test on the preprocessed dataset. After these tests, we retrieved the T-statistic value, Chi-square-statistic value and F-statistic value. So, we have the statistical values by which we can compare with the standard value (ALPHA) in the chart or statistics table and make a decision whether we should accept the null hypothesis or reject it. If we get the p-value less than ALPHA, we can reject the null hypothesis, meaning to accept the alternate hypothesis, that residential proximity has significant impact on academic performance. On the other hand, if the p-value is greater than ALPHA, we can accept the null hypothesis that living near institutions has no significant effect on academic results.

6 Data Analysis and Results

Data that was collected for this study was analysed using Python libraries. The data was collected using Google Forms. After organising the data, it was then imported

into Python for further analysis. Statistical techniques like descriptive statistics and correlation analysis were also used along with hypothesis testing (chi-square test, T-tests, and ANOVA). These tests determined the relationship between the dependent variable (academic performance) and the independent variable (living distance from the university).

7 Descriptive Analysis

To analyse the properties of the data, descriptive tests were applied. We categorised the responses to different groups based on living distance (less than 1 km, 1–5 km, 6–10 km, and more than 10 km) and academic performance (good, moderate, and bad). The mean, skewness, kurtosis, and variance of the dataset were also calculated to understand the distribution and variability of the responses. The data reliability was confirmed through various statistical tests, ensuring consistency in the responses.

7.1 Sample Summary

Out of 134 responses, 133 responses were valid, and 1 had a missing value, which included using the mean function. By this, we fixed inconsistent or incomplete data.

7.1.1 Mean

The mean for academic performance value is which is closer to 2. 1 represents good, 2 represents moderate, and 3 represents bad academic performance. So this suggests that a majority of students reported their academic performance as moderate. On the other hand, the mean value for the distance from the university is 2.365672, which tells us that students on average live in the 1–5 km range from the university.

7.1.2 Variance

Both the variances are < 1. Those are 0.336943 and 1.241219, respectively, which indicates the variance for academic performance is close to the mean. Also, the majority of students live within a close range of the university.

7.1.3 Standard Deviation

0.5804658 and 1.114100 both value further support the interpretation of the variance. Both imply that extreme changes are less common.

These relatively low variance and standard deviation signify that the majority of the students live close to the university. The academic performance, which is moderate with

low variance and standard deviation, implies that external factors like living distance might not drastically affect academic performance for most of the students.

7.1.4 Skewness

The following dataset has skewness values of -0.499008, 0.195120, 1.013353, 0.503964, 0.469394, 1.425796, 0.446847 and 0.000913, respectively. We can see that most of the values show positive skewness, meaning the data is generally clustered around lower values with a few higher outliers.

7.1.5 Kurtosis

The following dataset has Kurtosis values of -0.524493, -1.310243, -0.036925, -1.056618, -0.422388, 1.117241, -1.46279 and 0.023160. We can see that most of the values show negative kurtosis, meaning the distributions have lighter tails and fewer extreme outliers.

7.2 Test Results

7.2.1 T-test

The T-test concludes there is no significant relationship between academic performance and living distance in this sample of 25 students. Here the Pearson correlation coefficient is 0.1443, which indicates a very weak positive relationship between academic performance and living distance. Telling us there's no connection between these two factors.The p-value of 0.4913 and the t-statistic value of 0.6994 show that the result is not statistically significant ($p > 0.05$), meaning we fail to reject the null hypothesis.

7.2.2 Chi-Square Test

The Chi-Square Test also tells us we fail to reject the null hypothesis and there is no significant relationship between academic performance and living distance. Here a chi-square statistic of 10.53 and a p-value of 0.1040 ($p > 0.05$) indicate that the observed differences between living distance and academic performance are not statistically significant. Here the degree of freedom is 6.

8 Discussion on Hypothesis Testing

In this research we have used the T-test (we took random 25 samples for this among 134 samples) and the Chi-Square test. The means of the two groups can be compared using a statistical test called a T-test. It is frequently used in hypothesis testing to determine

whether two groups are distinct from one another or whether a process genuinely affects the population of interest. On the other hand, a statistical method for identifying the discrepancy between observed and expected data is the Chi-Square test. When two categorical variables differ, it can be helpful to determine whether this is because of a relationship between them or not. The T-test, which works best with smaller sample sizes, can be applied by selecting 30 data points at random from the 134 data points. It provides us with accurate comparisons between two groups for numerical or ordinal data. The result from the T-test is, there is no significant relationship between living distance and academic performance.

Furthermore, the Chi-Square test is perfect for examining correlations between categories, for example, between academic performance levels and living distance categories. The result from the Chi-Square test is that there is no significant relationship between living distance and academic performance. So, as we can see, both the tests give us the same results.

9 Conclusion

In conclusion, this research examines the effects of a variety of factors on students' academic performance, including living distance from the university, modes of transportation, and their study habits, for example, if they study in campus libraries, study rooms, etc. We also ask university students if long-distance disturbs their sleeping routine or not. Overall, from the data, we can't predict anything. That's why we have done hypothesis testing. From the hypothesis testing, we can see there is no significant relationship between living distance and academic performance. Both the T-test and the chi-square test give us the same results. This research is based on 130 university students. So, results may vary if anyone else does new research on more students. We hope our research is valuable for both students and educational institutions, as they can see whether this long-distance fact may hamper academic performance or not. This may help in the improvement of both academic achievement and the overall well-being of students.

References

1. Rahman. (2024). Youths account for 28pc of population. *The Daily Star*. Retrieved from `https://www.thedailystar.net/news/bangladesh/news/youths-account-28pc-popula`

2. Turley, R.N.L., & Wodkey, G. (2022). College Residence and Academic Performance: Who Benefits From Living on Campus? Retrieved from `https://www.researchgate.net/publication/238430321_College_Residence_and_Academic_Performance_Who_Benefits_From_Living_on_Campus`

3. Too Far To Go On? Distance to School and University Participation. Retrieved from `https://www150.statcan.gc.ca/n1/en/pub/11f0019m/11f0019m2002191-eng.pdf`

4. Access to College and University: Does Distance Matter? Retrieved from https://www150.statcan.gc.ca/n1/en/pub/11f0019m/11f0019m2003201-eng.pdf

5. Does distance determine who attends a university in Germany? Retrieved from https://www.econstor.eu/bitstream/10419/35080/1/574807837.pdf