

**ANALYZING PLACE OF RESIDENCE AS A PREDICTOR OF UNDERGRADUATE
ACADEMIC PERFORMANCE AT THE SCHOOL OF STATISTICS AND PLANNING
(SSP), MAKERERE UNIVERSITY**

BY

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**A DISSERTATION SUBMITTED TO THE SCHOOL OF STATISTICS AND
PLANNING IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE
AWARD OF THE DEGREE OF BACHELOR OF STATISTICS OF MAKERERE
UNIVERSITY**

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DECLARATION

I Mukama Peter, declare that this research study is my original work and has not been published anywhere or submitted to any University/Institution of higher learning for award of any academic qualification by anyone. It's now being presented as a partial fulfilment requirement of the award of Bachelor of Statistics, Makerere University, and Kampala.

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APPROVAL

I, the undersigned, certify that Mukama Peter carried out his undergraduate research under my supervision. I hereby pronounce that his dissertation is ready and has been submitted with my approval.

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DEDICATION

I dedicate this work to my parents and family, for their patience, sacrifice, and constant encouragement throughout my studies at Makerere University. Their support has carried me through every stage of this academic journey.

I also dedicate this work to my classmates and friends at the School of Statistics and Planning, who have shared in the challenges and milestones of this programme, and to everyone who has offered a word of encouragement along the way.

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ABSTRACT

This study analysed place of residence as a predictor of undergraduate academic performance among students of the School of Statistics and Planning (SSP), Makerere University. The specific objectives were to examine the effect of place of residence, distance to campus, accommodation expenditure, study environment, and internet accessibility on students' cumulative grade point average (CGPA).

A cross-sectional, quantitative research design was adopted. Primary data were collected from 250 undergraduate students at SSP using a structured, self-administered online questionnaire. Data were analysed at three levels: univariate analysis using frequencies, percentages, means, and standard deviations; bivariate analysis using the Pearson correlation coefficient; and multivariate analysis using ordinal logistic regression (the proportional-odds model), since the dependent variable, academic performance, is measured as four ordered CGPA categories rather than a continuous score. The model was checked for multicollinearity and for the proportional-odds (parallel-lines) assumption.

The univariate results showed that most respondents lived in private hostels close to campus and reported a moderately favourable study environment and internet accessibility. At the bivariate level, only internet accessibility was significantly and positively correlated with CGPA ($r = 0.17$, $p = 0.006$); place of residence, distance to campus, accommodation expenditure, and study environment were not significantly correlated with academic performance. The ordinal logistic regression confirmed this pattern: internet accessibility was the only variable with a statistically significant effect on the odds of being in a higher CGPA category (odds ratio = 1.40, 95% CI: 1.11–1.76, $p = 0.004$), while the remaining predictors were not significant at the 5% level. The overall model explained only a modest share of the variation in academic performance (McFadden pseudo R-squared = 0.01) and the overall likelihood-ratio test was not significant ($\chi^2(7) = 9.99$, $p = 0.189$).

The study concludes that, among SSP undergraduates, reliable internet access at one's residence is more strongly linked to academic performance than the type of residence, its distance from campus, its cost, or its physical study conditions. It is recommended that the university and private hostel operators around Makerere invest in reliable internet infrastructure, and that

students prioritise internet access when choosing accommodation, as a practical step toward supporting better academic outcomes.

Key words: place of residence, academic performance, CGPA, internet accessibility, undergraduate students, Makerere University.

CHAPTER ONE: INTRODUCTION

1.1 Introduction

Academic performance is an important indicator of students' learning outcomes and the effectiveness of higher education institutions. It is commonly measured using the Cumulative Grade Point Average (CGPA), which reflects a student's academic achievement over a specified period. Several factors influence academic performance, including students' socioeconomic characteristics, learning environment, motivation, and residential conditions. Among these factors, Place of residence has attracted increasing attention because it determines students' access to learning resources, commuting time, study environment, and social interactions, all of which may influence academic outcomes. Although previous studies have investigated the relationship between students' residence and academic performance, findings remain inconsistent across different contexts. This study, therefore, seeks to analyze whether Place of residence predicts undergraduate academic performance among students of the School of Statistics and Planning (SSP) at Makerere University.

1.2 Problem Statement

Makerere University accommodates undergraduate students in university halls of residence, privately owned hostels, rented houses, and family homes. These residential arrangements differ considerably in terms of proximity to campus, security, availability of study space, internet access, transport costs, and exposure to distractions. Such differences are likely to influence students' concentration, attendance, study habits, and ultimately their academic performance. Previous studies conducted at the School of Statistics and Planning have yielded mixed results regarding the influence of residence on academic performance, with some reporting significant associations. In contrast, others found little or no effect. Furthermore, most of these studies were conducted between 2019 and 2024, using relatively small samples, making it necessary to re-examine the relationship in the current learning environment, characterized by increased enrolment, expanded off-campus accommodation, and greater reliance on digital learning resources. The problem this research seeks to solve is the limited and inconsistent evidence regarding whether Place of residence significantly predicts undergraduate academic performance among SSP students at Makerere University.

1.3 Objectives of the Study

1.3.1 Main Objective

To analyze the effect of Place of residence on undergraduate academic performance among students of the School of Statistics and Planning, Makerere University.

1.3.2 Specific Objectives

1. To determine the effect of students' Place of residence on undergraduate academic performance at SSP.
2. To examine the effect of the distance between students' residences and Makerere University on undergraduate academic performance.
3. To assess the effect of students' monthly accommodation expenditure on undergraduate academic performance.
4. To examine the effect of the study environment at students' residences on undergraduate academic performance.
5. To determine the effect of internet accessibility in students' residences on undergraduate academic performance.

1.4 Research Hypotheses

H1: Students' Place of residence has a statistically significant effect on undergraduate academic performance.

H2: The distance between students' residences and Makerere University has a statistically significant negative effect on undergraduate academic performance.

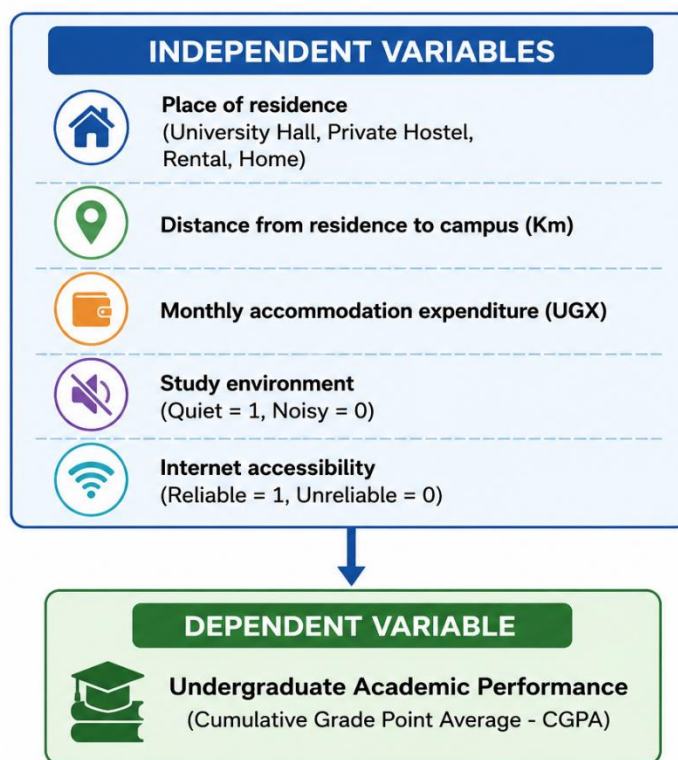
H3: Monthly accommodation expenditure has a statistically significant effect on undergraduate academic performance.

H4: A conducive study environment at students' residences positively influences undergraduate academic performance.

H5: Reliable internet accessibility at students' residences positively influences undergraduate academic performance.

1.5 Conceptual Framework

Figure 1.1: Conceptual Framework Showing the Relationship between Place of Residence and Undergraduate Academic Performance



The conceptual framework illustrates that undergraduate academic performance (dependent variable) is hypothesized to be influenced by students' Place of residence, distance to campus, accommodation expenditure, study environment, and internet accessibility. These independent variables are expected to influence students' study time, lecture attendance, academic engagement, and consequently their CGPA.

1.6 Justification of the Study

The findings of this study will contribute to understanding how students' residential conditions influence academic performance at Makerere University. The study will provide evidence to university administrators, hostel managers, policymakers, and students regarding residential factors that promote academic success. The findings may also guide accommodation policies, campus planning, and student welfare interventions to improve undergraduate academic performance.

CHAPTER TWO: LITERATURE REVIEW

2.1 Theoretical Review

This study is guided by Tinto's Student Integration Theory (1975; 1993) and Astin's Input–Environment–Outcome (I-E-O) Model (1993).

2.1.1 Tinto's Student Integration Theory

Tinto's (1975, 1993) success is greatly influenced by their academic and social integration within the university environment. Students who live on campus or in residences close to the university are more likely to participate in academic discussions, group assignments, library activities, consultations with lecturers, and extracurricular programs. Such interactions strengthen their commitment to learning and improve academic outcomes (Braxton, 2019).

Conversely, students who live far from campus may experience transportation challenges, fatigue, and lateness to lectures, as well as reduced participation in academic activities, thereby lowering their academic performance. Therefore, residence plays a critical role in determining students' opportunities for integration into university life.

2.1.2 Astin's Input–Environment–Outcome (I-E-O) Model

Astin (1993) explains that students' educational outcomes are determined by their personal characteristics (inputs) and the educational environment they experience. According to this theory, residence constitutes part of the learning environment because it determines access to study facilities, peer interaction, internet services, and a conducive learning atmosphere (Astin, 1997).

Students living in environments that promote concentration and academic engagement are expected to achieve higher CGPAs than those residing in noisy or resource-constrained environments. The two theories, therefore, provide a strong theoretical basis for examining how Place of residence predicts undergraduate academic performance.

2.2 Empirical Literature Review

2.2.1 Place of Residence and Academic Performance

Residence is one of the most important environmental factors affecting students' academic achievement. Research indicates that students residing in university halls often perform better academically because they have easier access to libraries, laboratories, lecturers, academic discussions, and university resources.

According to Astin (1993), students who reside on campus are more engaged in academic activities and demonstrate higher persistence and achievement than commuters. Similarly, Tinto (1993) argues that residential students are better integrated into university life, which promotes academic success.

Pike, K., & Gonyea (2008). (*Forces to Be Reckoned*, n.d.) Found that students living on campus generally attained higher GPAs compared to students living off campus because they spent more time participating in learning activities.

However, not all studies agree. Schudde (2011) (*Project MUSE - The Causal Effect of Campus Residency on College Student Retention*, n.d.) Found that the academic benefits of living on campus may vary depending on students' socioeconomic background and institutional characteristics.

In Uganda, university students live in various accommodation arrangements, including university halls, private hostels, rented houses, and family homes. While university halls provide proximity to academic facilities, private rentals may expose students to distractions such as domestic responsibilities, financial stress, and poor study conditions. Despite these observations, there is limited empirical evidence on how different residential categories affect undergraduate academic performance at the School of Statistics and Planning, Makerere University.

2.2.2 Distance from Residence to Campus and Academic Performance

The distance between students' residences and the campus is widely associated with academic outcomes. Long commuting distances increase travel time, transportation costs, stress, absenteeism, and lateness for lectures. Students who travel long distances often have less time available for studying and participating in academic activities.

According to Morris, Hirsch, and Manley (2016) (*Does Commuting Affect Health?* - Künn-Nelen - 2016 - *Health Economics* - Wiley Online Library, n.d.), commuting negatively affects students' academic engagement because travel consumes time that would otherwise be devoted to studying.

(Allen & Farber, 2020) Further, students with long commutes experience higher fatigue levels, lower class attendance, and reduced academic performance. Students living within walking distance of campus generally have better attendance rates, spend more time in libraries, and participate more actively in consultations with lecturers than those living far away.

Nevertheless, some researchers argue that effective time management can mitigate the negative effects of long commutes. Therefore, the relationship may differ across institutions and student populations.

2.2.3 Monthly Accommodation Expenditure and Academic Performance

Accommodation expenditure reflects students' financial investment in housing and may influence the quality of their living conditions. Higher accommodation costs may enable students to access secure, quiet, and well-equipped residences with electricity, internet, and study spaces that support learning. However, excessive accommodation costs may also increase financial pressure on students, forcing them to take on part-time employment or reduce expenditure on academic materials.

According to Goldrick-Rab (*Paying the Price...*, n.d.), financial insecurity is associated with increased stress, poor concentration, and lower academic performance among university students. Similarly, Robb (2017) (*The Influences of Financial Self-Efficacy and Financial Socialization on College Students' Financial Stress and Coping* - ProQuest, n.d.) Found that students experiencing financial challenges reported lower GPAs compared to financially stable students.

In Uganda, accommodation costs vary considerably between university halls, private hostels, and rental houses. These differences may indirectly influence students' academic outcomes by affecting living conditions and financial wellbeing.

2.2.4 Study Environment and Academic Performance

A conducive study environment is essential for effective learning. Students living in quiet environments can concentrate, revise consistently, complete assignments on time, and adequately

prepare for examinations. Noise pollution, overcrowding, poor lighting, and inadequate study space reduce concentration and increase mental fatigue.

According to Evans (2006)(*Child Development and the Physical Environment* | *Annual Reviews*, n.d.), environmental distractions significantly reduce cognitive performance and learning efficiency.

Likewise, Tanner (2009)(*Effects of School Design on Student Outcomes* | *Journal of Educational Administration* | *Emerald Publishing*, n.d.) Reported that comfortable learning environments positively influence students' academic achievement. Private hostels and rented houses often differ significantly in study conditions, making the quality of the study environment an important predictor of academic performance.

2.2.5 Internet Accessibility and Academic Performance

Reliable internet access has become an essential resource for university education. Students use internet services to access online journals, electronic books, lecture notes, virtual learning platforms, statistical software, research databases, and communication with lecturers.

According to *the Organization for Economic Co-Operation and Development (OECD)* (102 | V2, n.d.), digital access significantly improves students' learning opportunities and academic outcomes. The COVID-19 pandemic further demonstrated the importance of stable internet connectivity for higher education.

Students with reliable internet connections generally complete coursework more efficiently than those with unstable connections. Nevertheless, excessive internet use for entertainment and social media may negatively affect academic performance.

2.3 Research Gap

Although numerous studies have examined factors influencing academic performance among university students, relatively few have focused specifically on Place of residence as a predictor of undergraduate academic performance within Ugandan public universities. Most previous studies have been conducted in developed countries, where accommodation systems, student welfare, transport infrastructure, and internet access differ substantially from those in the Ugandan context. Furthermore, many studies have examined only one aspect of residence, such as on-campus versus off-campus living, while neglecting other important residential

characteristics, including commuting distance, accommodation expenditure, study environment, and internet accessibility.

At Makerere University, particularly within the School of Statistics and Planning, there is limited empirical evidence on how these residential factors jointly predict students' cumulative GPA. This study, therefore, seeks to bridge this gap by providing evidence specific to undergraduate students at SSP, Makerere University.

2.4 Summary of the Literature Review

The reviewed literature demonstrates that residential factors play a significant role in determining students' academic performance. Place of residence influences students' access to academic resources, social integration, commuting experiences, study environments, financial well-being, and internet accessibility. However, previous studies have reported mixed findings, and there remains limited evidence from the Ugandan higher education context. Consequently, this study aims to determine whether Place of residence predicts undergraduate academic performance among students at the School of Statistics and Planning, Makerere University.

CHAPTER THREE: METHODOLOGY

3.1 Introduction

This chapter presents the methodology that will be used in the study. It describes the research design, study area, study population, sample size, data collection instrument, measurement of variables, instrument validity, data collection procedure, data management, data analysis, ethical considerations, and limitations of the study.

3.2 Research Design

The study will adopt a cross-sectional research design using a quantitative approach. The quantitative approach is suitable because it allows the use of numerical data and statistical techniques to examine the relationship between Place of residence and undergraduate academic performance.

3.3 Study Area

The study will be conducted at the School of Statistics and Planning (SSP) at Makerere University, in Kampala, Uganda. SSP is one of the academic units under the College of Business and Management Sciences (CoBAMS). The school attracts students from across Uganda who reside in university halls, private hostels, rented houses, or family homes. These variations in residence make SSP an appropriate setting for this study.

3.4 Study Population

The study population will comprise all undergraduate students of the School of Statistics and Planning at Makerere University during the 2025/2026 academic year. These students are appropriate for the study because they experience different residential conditions, which may influence their academic performance.

3.5 Sample Size

The exact size of the study population (all undergraduate students of the School of Statistics and Planning in the 2025/2026 academic year) was not available from SSP records at the time of the

study; the population was therefore treated as unknown/infinite for sampling purposes. In such cases, the appropriate procedure is Cochran's (1963) formula for determining sample size when the population size is unknown:

$$n_0 = Z^2 pq / e^2$$

Where n_0 is the required sample size, Z is the standard normal value corresponding to the desired confidence level, p is the estimated proportion of the population expected to exhibit the characteristic under study (set at $p = 0.5$, since this maximizes $pq = p(1-p)$ and therefore gives the most conservative, largest possible sample size when no prior estimate of p exists), $q = 1-p$, and e is the desired margin of error (level of precision).

At the conventional 95% confidence level ($Z = 1.96$) and a 5% margin of error ($e = 0.05$), the ideal minimum sample size is $n_0 = (1.96)^2(0.5)(0.5) / (0.05)^2 = 384$ respondents. Reaching all 384 respondents was not feasible within the time and resource constraints of an undergraduate dissertation. Following Israel's (2013) and Yamane's (1967) guidance that a somewhat wider margin of error (up to about 6-8%) remains methodologically acceptable for exploratory social-science survey research, the study set its data-collection target using a margin of error of $e = 6.2\%$, which is still within this acceptable range and yields a required sample of $n_0 = (1.96)^2(0.5)(0.5) / (0.062)^2 \approx 250$ respondents. Data collection proceeded until this target was met, yielding exactly 250 valid, fully completed responses from undergraduate students of the School of Statistics and Planning, which is the sample analysed in Chapter Four.

3.6 Data Collection Instrument

Primary data will be collected using a structured questionnaire. The questionnaire will include closed-ended questions to facilitate coding and statistical analysis.

The questionnaire will be divided into the following sections:

- Section A: Background information
- Section B: Place of residence
- Section C: Residential characteristics (distance, cost, study environment, internet access)

- Section D: Academic performance (CGPA)

The questions will be simple, clear, and designed to capture all variables in the conceptual framework.

3.7 Measurement of Variables

Variable	Measurement
Academic Performance (Dependent Variable)	Cumulative Grade Point Average (CGPA)
Place of Residence	University Hall / Private Hostel / Rental / Home
Distance to Campus	Kilometers (Km)
Monthly Accommodation Expenditure	Uganda Shillings (UGX)
Study Environment	Quiet = 1, Noisy = 0
Internet Accessibility	Reliable = 1, Unreliable = 0

3.8 Data Management

After data collection, questionnaires will be checked for completeness, coded, and entered into Microsoft Excel. The data will then be exported to statistical software for analysis.

Data cleaning will be carried out to identify missing values, errors, and inconsistencies before analysis.

3.9 Data Analysis

Data will be analyzed using descriptive statistics and inferential statistics.

3.9.1 Descriptive Statistics

Descriptive statistics, including frequencies, percentages, means, and standard deviations, will be used to summarize respondents' characteristics and study variables.

3.9.2 Inferential Statistics

Ordinal logistic regression (the proportional-odds / cumulative-logit model) will be used to determine whether place of residence and related factors influence undergraduate academic performance. This model is appropriate because the dependent variable, academic performance, is measured as an ordered categorical outcome (four CGPA bands) rather than a continuous score, so the equal-interval assumption required by ordinary least squares (OLS) regression does not hold.

The model is specified as follows:

$$\ln[P(Y_i \leq j) / (1 - P(Y_i \leq j))] = \tau_j - (\beta_1 \text{PR_HOSTEL}_i + \beta_2 \text{PR_RENTED}_i + \beta_3 \text{PR_PARENTS}_i + \beta_4 \text{DIST}_i + \beta_5 \text{COST}_i + \beta_6 \text{ENV}_i + \beta_7 \text{NET}_i) \quad \text{for } j = 1, 2, 3$$

Where:

- Y_i = CGPA category of student I
- CGPA = Academic performance
- PR = Place of residence
- DIST = Distance to campus
- COST = Monthly accommodation expenditure
- ENV = Study environment
- NET = Internet accessibility
- τ_j = threshold (cut-point) separating CGPA category j from category $j+1$ ($j = 1, 2, 3$), estimated jointly with the β coefficients

The level of significance will be 5% ($\alpha = 0.05$).

3.10 Ethical Considerations

The study will observe ethical principles, including:

- Obtaining permission from SSP authorities
- Voluntary participation of respondents
- Informed consent before data collection
- Confidentiality and anonymity of respondents
- Use of data strictly for academic purposes
- Right of respondents to withdraw at any time

3.11 Limitations of the Study

The study may face the following limitations:

- Non-probability (convenience) sampling of accessible SSP undergraduates via a self-administered online link, which may limit generalization to the wider SSP student population despite the achieved sample of 250 respondents meeting the calculated minimum sample-size target
- Possible inaccuracies in self-reported CGPA
- Time and financial constraints
- Cross-sectional design limiting causal interpretation

CHAPTER FOUR: DATA PRESENTATION, ANALYSIS AND INTERPRETATION OF RESULTS

4.1 Introduction

This chapter presents the results of the data collected from 250 undergraduate students of the School of Statistics and Planning (SSP), Makerere University, on place of residence and undergraduate academic performance. The chapter is organised into three main parts. Section 4.2 presents univariate analysis results, showing the distribution of respondents with respect to the dependent variable (academic performance, measured by CGPA) and the independent variables identified in the study objectives, namely place of residence, distance to campus, monthly accommodation expenditure, study environment, and internet accessibility. Section 4.3 presents bivariate analysis results based on the Pearson correlation coefficient matrix, while Section 4.4 presents the results of the ordinal logistic regression (proportional-odds) model together with its specification and diagnostic tests. Section 4.5 concludes the chapter. All variables are presented with their respective codes so that each table is self-explanatory, and all statistics are rounded to one or two decimal places. Consistent with the sample size determination in Section 3.5, all 250 valid, fully completed responses were retained for analysis after data cleaning confirmed no missing values, no duplicate submissions, and no invalid or out-of-codebook entries.

4.2 Univariate Analysis Results

This section presents the frequency distribution of respondents on the dependent variable and the independent variables, in the order in which they appear in the study objectives, hypotheses, conceptual framework, and literature review. Background characteristics of respondents are presented first, followed by the dependent variable (academic performance), and then the independent variables: place of residence, distance to campus, monthly accommodation expenditure, study environment, and internet accessibility.

(a) Background Characteristics of Respondents

Table 4. 1: Background characteristics of responds (n=250)

Variable	Category	Frequency	Percent (%)
Age (AGE)	Below 20 years	4	1.6
	20–24 years	223	89.2
	25–29 years	22	8.8
	30+ years	1	0.4
Sex (SEX)	Male	121	48.4
	Female	129	51.6
Year of Study (YEAR)	Year One	77	30.8
	Year Two	71	28.4
	Year Three	102	40.8
Programme of Study (PROG)	Bachelor of Statistics	67	26.8
	Bachelor of Science in Quantitative Economics	76	30.4
	Bachelor of Population	57	22.8

Variable	Category	Frequency	Percent (%)
	Studies		
	Bachelor of Science in Actuarial Science	50	20.0
	Total	250	100.0

(b) Dependent Variable: Undergraduate Academic Performance

Table 4. 2: Distribution of Respondents by Current CGPA (Academic Performance –CGPA)

CGPA Category	Frequency	Percent (%)
Below 2.0	0	0.0
2.0 – 2.99	46	18.4
3.0 – 3.59	64	25.6
3.6 – 4.39	92	36.8
4.4 – 5.0	48	19.2
Total	250	100.0

(c) Independent Variable: Place of Residence (PR)

Table 4. 3: Distribution of Respondents of Place of Residence (PR)

Residence Category	Frequency	Percent (%)
University Hall of Residence	69	27.6
Private Hostel	89	35.6
Rented House/Apartment	45	18.0
Living with Parents/Guardians	47	18.8
Total	250	100.0

(d) Independent Variable: Distance to Campus (DIST)

Table 4. 4: **Distribution of Respondents by Distance of Residence from Campus (DIST)**

Distance Category	Frequency	Percent (%)
Less than 1 km	122	48.8
1 – 3 km	49	19.6
4 – 6 km	46	18.4
More than 6 km	33	13.2
Total	250	100.0

(e) Independent Variable: Monthly Accommodation Expenditure (COST)

Table 4. 5: **Distribution of Respondents by Accommodation Expenditure per Semester (COST)**

Expenditure Category	Frequency	Percent (%)
Less than 800,000	90	36.0
800,000 – 999,999	58	23.2
1,000,000 – 1,199,999	43	17.2
1,200,000 and above	59	23.6
Total	250	100.0

(f) Independent Variable: Study Environment (ENV)

Table 4. 6: Distribution of Respondents by Study Environment Ratings (ENVI-ENV4)

Item	SD f (%)	D f (%)	N f (%)	A f (%)	SA f (%)
My place of residence provides a quiet environment for studying.	30 (12.0)	48 (19.2)	46 (18.4)	77 (30.8)	49 (19.6)
My residence has adequate lighting for studying.	18 (7.2)	39 (15.6)	41 (16.4)	101 (40.4)	51 (20.4)
I have enough space to study comfortably.	20 (8.0)	43 (17.2)	44 (17.6)	98 (39.2)	45 (18.0)
My residence allows me to study without frequent interruptions.	22 (8.8)	38 (15.2)	52 (20.8)	95 (38.0)	43 (17.2)

SD = Strongly Disagree, D = Disagree, N = Neutral, A = Agree, SA = Strongly Agree, each coded 1–5. ENV_INDEX is the mean of ENV1–ENV4 Mean = 3.40, SD = 0.88

(g) Independent Variable: Internet Accessibility (NET)

Table 4. 7: Distribution of Respondents by Internet Accessibility Ratings (NET1-NET3)

Item	SD f (%)	D f (%)	N f (%)	A f (%)	SA f (%)
I have reliable internet access at my residence.	22 (8.8)	54 (21.6)	38 (15.2)	86 (34.4)	50 (20.0)
Internet connectivity at my residence supports online learning.	24 (9.6)	51 (20.4)	33 (13.2)	88 (35.2)	54 (21.6)
I can easily access online academic resources from my residence.	22 (8.8)	44 (17.6)	41 (16.4)	94 (37.6)	49 (19.6)

SD = Strongly Disagree, D = Disagree, N = Neutral, A = Agree, SA = Strongly Agree, each coded 1–5. NET_INDEX is the mean of NET1–NET3; Mean = 3.39, SD = 1.04

(h) Summary Statistics of Continuous and Composite Variables

Table 4. 8: Summary Statistics of Continuous and Composite Study Variables (n=250)

Variable	Mean	SD	Min	Max
Academic Performance (CGPA)	3.68	0.73	2.50	4.70
Distance to campus (km)	2.48	2.42	0.50	7.00
Accommodation expenditure (UGX, millions)	0.95	0.27	0.65	1.35
Study environment	3.40	0.88	1.00	5.00
Internet accessibility composite index (1–5)	3.39	1.04	1.00	5.00

Source: Primary data, 2026. CGPA is the mid-point numerical proxy of the CGPA category (e.g., 3.6-4.39 = 4.00); DIST is the mid-point kilometre value of the distance category; COST is the mid-point expenditure value (millions of UGX); ENV_INDEX and NET_INDEX are the mean scores of the corresponding Likert items. These continuous variables are used in the bivariate and multivariate analyses in Sections 4.3 and 4.4.

Overall, the results in Tables 4.1 to 4.8 show that the majority of respondents (36.8%) had a CGPA in the range of 3.6-4.39, while a further 19.2% had a CGPA of 4.4-5.0; slightly more than a third (35.6%) resided in private hostels, and just under half of respondents (48.8%) lived less than 1 km from Makerere University. About a third of the respondents (36.0%) spent less than UGX 800,000 on accommodation per semester. Respondents generally reported a moderate study environment (mean ENV_INDEX = 3.40) and a moderate level of internet accessibility (mean NET_INDEX = 3.39) at their places of residence.

4.3 Bivariate Analysis Results

This section presents the Pearson correlation coefficient matrix for the dependent variable (CGPA) and the independent variables (PR, DIST, COST, ENV_INDEX, and NET_INDEX). Correlation coefficients (r) range from -1 to $+1$, with values close to 0 indicating a weak linear relationship and values close to ± 1 indicating a strong linear relationship. Statistical significance is assessed at the 5% level ($p < 0.05$).

Table 4. 9: **Pearson Correlation Coefficient Matrix for Study Variables (n=250)**

Variable (Code)	CGPA	PR	DIST	COST	ENV_INDEX	NET_INDEX
CGPA (Academic Performance)	1.00	-0.00	-0.00	0.01	0.03	0.17**
PR (Place of Residence)	-0.00	1.00	0.59***	0.13*	-0.17**	-0.15*
DIST (Distance to Campus)	-0.00	0.59***	1.00	0.06	-0.11	-0.12
COST (Accommodation Expenditure)	0.01	0.13*	0.06	1.00	-0.03	0.02

Variable (Code)	CGPA	PR	DIST	COST	ENV_INDEX	NET_INDEX
ENV_INDEX (Study Environment)	0.03	-0.17**	-0.11	-0.03	1.00	0.22***
NET_INDEX (Internet Accessibility)	0.17**	-0.15*	-0.12	0.02	0.22***	1.00

Variables Negatively Related to the Dependent Variable

Among the study variables, two exhibited a negative (though negligible) correlation with undergraduate academic performance: Place of Residence (PR, $r = -0.005$, $p = 0.939$) and Distance to Campus (DIST, $r = -0.00001$, $p = 0.999$). These near-zero relationships suggest that, as the residence category code increases (that is, moving from University Hall of Residence toward Private Hostel, Rented House/Apartment, and Living with Parents/Guardians), and as distance from campus increases, CGPA does not decline in any meaningful or reliable way. Both coefficients are effectively indistinguishable from zero and are statistically insignificant ($p > 0.05$), meaning that no meaningful association exists between either place of residence or distance to campus, as coded in this study, and academic performance among SSP respondents. This result does not support Hypothesis H1, which anticipated a statistically significant effect of place of residence on academic performance, nor Hypothesis H2, which anticipated a statistically significant negative effect of distance on academic performance.

Variables Positively Related to the Dependent Variable

Accommodation Expenditure (COST, $r = 0.01$, $p = 0.884$), Study Environment (ENV_INDEX, $r = 0.03$, $p = 0.655$), and Internet Accessibility (NET_INDEX, $r = 0.17$, $p = 0.006$) were all positively correlated with academic performance. Of these, only the correlation between Internet Accessibility and CGPA was statistically significant at the 5% level. This indicates that respondents who reported more reliable internet access at their residences tended to have higher CGPAs, providing support for Hypothesis H5, which anticipated that reliable internet accessibility positively influences undergraduate academic performance. The positive but statistically insignificant correlations for accommodation expenditure and study environment, together with the near-zero (and statistically insignificant) correlations for place of residence and distance to campus, suggest that, on their own, none of these four variables has a strong linear association with academic performance in this sample, although place of residence displayed a moderately strong relationship with distance to campus, and study environment displayed a moderately strong relationship with internet accessibility, which is examined further in the multivariate analysis in Section 4.4.

4.4 Multiple Variable (Multivariate) Analysis Results

This section presents the results of the ordinal logistic regression (proportional-odds) model estimated to determine the joint effect of place of residence and related residential factors on undergraduate academic performance, in line with the model specified in Chapter Three:

$$\ln[P(Y_i \leq j) / (1 - P(Y_i \leq j))] = \tau_j - (\beta_1 \text{PR_HOSTEL}_i + \beta_2 \text{PR_RENTED}_i + \beta_3 \text{PR_PARENTS}_i + \beta_4 \text{DIST}_i + \beta_5 \text{COST}_i + \beta_6 \text{ENV}_i + \beta_7 \text{NET}_i) \quad \text{for } j = 1, 2, 3$$

Place of Residence (PR) is a categorical variable and was entered as three dummy variables (PR_HOSTEL, PR_RENTED, PR_PARENTS), with University Hall of Residence as the reference category. In this specification, academic performance is treated as an ordinal categorical dependent variable with four naturally ordered categories (2.0–2.99, 3.0–3.59, 3.6–4.39, 4.4–5.0).

Table 4. 10: Ordinal Logistic Regression (Proportional-Odds) Results for the Effect of Place of Residence and Related Factors on Academic Performance (Dependent Variable: CGPA Category)

Code	Variable	Odds Ratio (Exp(β))	95% CI Lower	95% CI Upper	p-value
PR_HOSTEL	Private Hostel (ref: University Hall)	0.963	0.504	1.841	0.909
PR_RENTED	Rented House/Apartment (ref: University Hall)	1.451	0.634	3.320	0.378
PR_PARENTS	Living with Parents/Guardians (ref: University Hall)	0.975	0.419	2.272	0.954

Code	Variable	Odds Ratio (Exp(β))	95% CI Lower	95% CI Upper	p-value
	Hall)				
DIST	Distance to Campus (km)	1.008	0.895	1.136	0.891
COST	Accommodation Expenditure (UGX, millions)	0.954	0.391	2.328	0.917
ENV_INDEX	Study Environment (composite index)	0.958	0.736	1.246	0.749
NET_INDEX	Internet Accessibility (composite index)	1.398	1.114	1.755	0.004*

Test statistic	Value
Number of observations (N)	250
-2 Log-likelihood (full model)	662.53
-2 Log-likelihood (intercept only)	672.51
Likelihood Ratio χ^2 (df = 7)	9.99
Prob (Likelihood Ratio χ^2)	0.189

Test statistic	Value
McFadden Pseudo R-squared	0.01
Threshold τ_1 (Cat $\leq$ “2.0–2.99”)	-0.51 (SE 0.71)
Threshold τ_2 (Cat $\leq$ “3.0–3.59”)	0.78 (SE 0.71)
Threshold τ_3 (Cat $\leq$ “3.6–4.39”)	2.50 (SE 0.73)

Significant at 5% level ($p < 0.05$). Dependent variable = CGPA. Reference category for Place of Residence = University Hall of Residence (PR_HALL).

As shown in Table 4.10, only Internet Accessibility (NET_INDEX) had a statistically significant effect on undergraduate academic performance. A one-unit increase in the internet accessibility composite score (on the 1–5 scale) was associated with an odds ratio of 1.40 (95% CI: 1.11–1.76, $p = 0.004$): the odds of a student being in a higher rather than a lower CGPA category increased by about 40%, holding place of residence, distance to campus, accommodation expenditure, and study environment constant. This supports Hypothesis H5. None of the other variables – place of residence, distance to campus, accommodation expenditure, and study environment – had a statistically significant effect on CGPA category: their odds ratios were all close to 1 and each 95% confidence interval spanned 1 (Table 4.10), so Hypotheses H1, H2, H3, and H4 are not supported by the multivariate results. The model as a whole explained only a modest share of the variation in academic performance (McFadden pseudo R-squared = 0.01), and the overall likelihood-ratio test was not statistically significant ($\chi^2(7) = 9.99$, $p = 0.189$), indicating that, jointly, the seven independent variables do not significantly predict undergraduate academic performance in this sample beyond the effect of internet accessibility. Despite the sample size of 250, the model's explanatory power remained limited, which suggests that this ceiling is not primarily a small-sample issue but rather reflects that other factors not captured in this model, such as individual study habits, prior academic ability, motivation, and lecture attendance, likely account for a large share of the variation in academic performance.

Specification and Diagnostic Tests

To assess the validity of the ordinal logistic regression model, the following specification tests were conducted: multicollinearity (Variance Inflation Factor) and the proportional-odds (parallel-lines) assumption, which tests whether the effect of each predictor is the same across all cumulative CGPA-category cut-points, as the model assumes. An assessment of endogeneity is also provided qualitatively.

Table 4. 11: **Variance Inflation Factors (VIF) for Multicollinearity Diagnosis**

Code	Variable	VIF
PR_HOSTEL	Private Hostel	1.92
PR_RENTED	Rented House/Apartment	2.05
PR_PARENTS	Living with Parents/Guardians	2.04
DIST	Distance to Campus	1.59
COST	Accommodation Expenditure	1.20
ENV_INDEX	Study Environment	1.09
NET_INDEX	Internet Accessibility	1.07

A VIF value below 5 indicates no serious multicollinearity problem among the predictors.

All VIF values in Table 4.11 are below the conventional threshold of 5 (ranging from 1.07 to 2.05), indicating that multicollinearity is not a serious problem in the estimated model and that the regression coefficients can be reliably interpreted.

Table 4.12: Summary of Specification and Diagnostic Test Results

Test	Purpose	Statistic	p-value	Conclusion
Test of Parallel Lines (proportional-odds assumption)	Tests whether predictor effects are constant across CGPA-category cut-points	$\chi^2 = 17.72$ (df = 14)	0.220	Assumption not violated ($p > 0.05$); proportional-odds model is adequate

The test of the proportional-odds (parallel-lines) assumption compares the fitted proportional-odds model against a less restrictive model that allows each predictor's effect to differ across the three cumulative cut-points of CGPA category. The likelihood-ratio test was not statistically significant ($\chi^2(14) = 17.72$, $p = 0.220$), indicating that the assumption of proportional odds is not violated: the effect of place of residence, distance to campus, accommodation expenditure, study environment, and internet accessibility can reasonably be treated as constant across CGPA-category thresholds, so a single set of β coefficients (Table 4.10) is an adequate and parsimonious summary of the relationship. On endogeneity, no formal statistical test (e.g., Hausman test) could be performed because the survey did not collect valid instrumental variables; however, the possibility of endogeneity arising from reverse causality (for example, students with higher CGPAs might be more able to afford or choose better residences) or from omitted variables (such as prior academic ability or personal motivation) cannot be ruled out and is acknowledged as a limitation of the cross-sectional design.

4.5 Conclusion

This chapter has presented the univariate, bivariate, and multivariate results on the effect of place of residence on undergraduate academic performance among 250 students of the School of Statistics and Planning, Makerere University. The univariate results showed that most respondents lived in private hostels close to campus and reported a moderate study environment and internet accessibility. The bivariate results revealed that, of all the study variables, only internet accessibility had a statistically significant positive correlation with CGPA, while place of residence, distance to campus, accommodation expenditure, and study environment all had

negligible correlations with CGPA that were not statistically significant. The ordinal logistic regression results confirmed this pattern: internet accessibility was the only variable with a statistically significant effect on the odds of higher academic performance, while place of residence, distance to campus, accommodation expenditure, and study environment did not significantly predict CGPA category once other factors were controlled for. The diagnostic tests indicated that the model did not suffer from serious multicollinearity and that the proportional-odds assumption underlying the model was not violated, supporting the reliability of this specific finding even though the overall explanatory power of the model was modest (McFadden pseudo R -squared = 0.01). These findings suggest that, among SSP undergraduates, reliable internet access at one's residence is a more important predictor of academic performance than the type of residence itself, its distance from campus, its cost, or its physical study conditions. The implications of these findings for theory, policy, and practice are discussed in Chapter Five.

CHAPTER FIVE: SUMMARY AND RECOMMENDATIONS

5.1 Summary

This study was guided by the main objective of analyzing the effect of place of residence on undergraduate academic performance among students of the School of Statistics and Planning (SSP), Makerere University. In line with this main objective, the study pursued five specific objectives: (i) to determine the effect of students' place of residence on undergraduate academic performance at SSP; (ii) to examine the effect of the distance between students' residences and Makerere University on undergraduate academic performance; (iii) to assess the effect of students' monthly accommodation expenditure on undergraduate academic performance; (iv) to examine the effect of the study environment at students' residences on undergraduate academic performance; and (v) to determine the effect of internet accessibility in students' residences on undergraduate academic performance.

The study adopted a cross-sectional research design using a quantitative approach, guided by Tinto's Student Integration Theory and Astin's Input–Environment–Outcome (I-E-O) Model. Primary data were collected using a structured, closed-ended, self-administered online questionnaire covering respondents' background information, place of residence, residential characteristics (distance, accommodation expenditure, study environment, and internet accessibility), and academic performance (CGPA). Because the exact size of the SSP undergraduate population was unknown, the required sample size was determined using Cochran's (1963) formula for an unknown population; applying a 6.2% margin of error (within the range considered acceptable for exploratory social-science survey research) at the 95% confidence level yielded a target of 250 respondents, which was achieved exactly, with 250 valid, fully completed responses received and used in the analysis. Because the questionnaire was distributed as a self-administered online link to accessible SSP undergraduates rather than drawn from a formal probability sampling frame, the sampling design used is best described as a non-probability design; this is acknowledged as a methodological limitation when generalizing the findings to the wider SSP student population.

Data were analyzed using both descriptive and inferential statistics. Descriptive (univariate) statistics (frequencies, percentages, means, and standard deviations) were used to summarize respondents' demographic characteristics and the distribution of the dependent and independent variables. Bivariate analysis was conducted using the Pearson correlation coefficient to examine the linear associations between academic performance and each

independent variable. Inferential (multivariate) analysis was conducted using ordinal logistic regression (the proportional-odds model) to jointly estimate the effect of place of residence, distance to campus, accommodation expenditure, study environment, and internet accessibility on CGPA category, at a 5% level of significance ($\alpha = 0.05$), since CGPA was measured as four ordered categories rather than a continuous score. The model was further subjected to specification and diagnostic tests, namely the Variance Inflation Factor (VIF) for multicollinearity and a likelihood-ratio test of the proportional-odds (parallel-lines) assumption.

5.2 Summary of Key/Significant Results from the Econometric Analysis

The bivariate (Pearson correlation) analysis showed that, of the five study variables, only internet accessibility (NET_INDEX) had a statistically significant relationship with academic performance ($r = 0.17$, $p = 0.006$), and this relationship was positive. Place of residence ($r = -0.005$, $p = 0.939$), distance to campus ($r = -0.00001$, $p = 0.999$), accommodation expenditure ($r = 0.01$, $p = 0.884$), and study environment ($r = 0.03$, $p = 0.655$) were not significantly correlated with CGPA.

The ordinal logistic regression results confirmed this pattern: internet accessibility remained the only variable with a statistically significant effect on academic performance after controlling for the other variables. A one-unit increase in the internet accessibility composite score (on a 1–5 scale) was associated with an odds ratio of 1.40 (95% CI: 1.11–1.76, $p = 0.004$) of being in a higher rather than a lower CGPA category, holding place of residence, distance to campus, accommodation expenditure, and study environment constant. None of the place-of-residence categories (private hostel, rented house/apartment, or living with parents/guardians, each compared with university hall of residence), distance to campus, accommodation expenditure, or study environment had a statistically significant effect on CGPA category: all had odds ratios close to 1 with confidence intervals spanning 1 (Table 4.10). Consequently, Hypothesis H5 (reliable internet accessibility positively influences undergraduate academic performance) was the only hypothesis supported by the data; Hypotheses H1, H2, H3, and H4 were not supported.

The overall ordinal logistic regression model explained only a modest share of the variation in academic performance (McFadden pseudo R-squared = 0.01), and the overall likelihood-ratio test was not statistically significant ($\chi^2(7) = 9.99$, $p = 0.189$), indicating limited joint explanatory power beyond the effect of internet accessibility. The diagnostic tests showed

that the model met its key assumptions: all VIF values were below 5 (range 1.07–2.05), indicating no serious multicollinearity; and the likelihood-ratio test of the proportional-odds assumption was not significant ($\chi^2(14) = 17.72$, $p = 0.220$), indicating that a single set of coefficients across CGPA-category thresholds is an appropriate simplification, so the study's central finding does not depend on relaxing the proportional-odds assumption.

5.3 Recommendations

The recommendations below are drawn strictly from the statistically significant finding of the study the significant positive effect of internet accessibility on undergraduate academic performance since this was the only variable that had a statistically significant effect on CGPA in both the bivariate and multivariate analyses.

Internet accessibility had a statistically significant positive effect on the odds of higher undergraduate academic performance (odds ratio = 1.40, 95% CI: 1.11–1.76, $p = 0.004$), meaning that students with more reliable internet access at their residences were more likely to achieve higher CGPAs.

It is therefore recommended that the School of Statistics and Planning and Makerere University management extend and strengthen campus Wi-Fi coverage to areas immediately surrounding the university and, where possible, negotiate discounted data bundles or subsidised internet packages with telecom providers on behalf of registered students, so that reliable internet access is not limited to only those who can afford it.

It is therefore recommended that owners and managers of private hostels and rented accommodation around Makerere University invest in reliable internet infrastructure (such as fibre or dedicated Wi-Fi routers) as a standard amenity, and market this feature explicitly to students, since it is directly linked to better academic outcomes rather than being a peripheral convenience.

It is therefore recommended that individual students prioritise reliable internet access when choosing a place of residence and budget specifically for internet or mobile data costs as part of their essential academic expenses, rather than treating internet access as a discretionary or purely social expense, given its demonstrated link to CGPA.

It is therefore recommended that national and local policymakers, including the Uganda Communications Commission and internet service providers, support the expansion of affordable broadband infrastructure in areas surrounding public universities such as Makerere,

as improved internet accessibility for students has a demonstrable positive association with academic performance and, by extension, national human capital development.

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APENDIX

Appendix 1: Questionnaire of the study

Residence and Academic Performance Study

Good day. I am a student pursuing a Bachelor of Statistics, conducting a study on how students' place of residence influences academic performance among undergraduate students in the School of Statistics and Planning (SSP), Makerere University. Your participation is voluntary. The information provided in this study will be treated with strict confidentiality and will be used only for academic purposes.

*** Do you consent to participate in this study?**

- ☐ Yes
- ☐ No

▼ Section A: Demographic Information

*** Age**

- ☐ Below 20 years
- ☐ 20–24 years
- ☐ 25–29 years
- ☐ 30+ years

*** Sex**

- ☐ Male
- ☐ Female

*** Year of Study**

- ☐ Year One
- ☐ Year Two
- ☐ Year Three

*** Programme of Study**

- ☐ Bachelor of Statistics
- ☐ Bachelor of Science in Quantitative Economics
- ☐ Bachelor of Population Studies

- Bachelor of Science in Actuarial Science

▼ Section B: Place of Residence

*** Where do you currently reside during the semester?**

- University Hall of Residence
- Private Hostel
- Rented House/Apartment
- Living with Parents/Guardians
- Others

*** Approximately how far is your residence from Makerere University?**

- Less than 1 km
- 1–3 km
- 4–6 km
- More than 6 km

*** How much do you spend on accommodation per semester (UGX)?**

- Less than 800,000
- 800,000–999,999
- 1,000,000–1,199,999
- 1,200,000 and above

▼ Section C: Study Environment

*** My place of residence provides a quiet environment for studying.**

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

*** My residence has adequate lighting for studying.**

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neutral
- ☐ Agree
- ☐ Strongly Agree

*** I have enough space to study comfortably.**

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neutral
- ☐ Agree
- ☐ Strongly Agree

*** My residence allows me to study without frequent interruptions.**

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neutral
- ☐ Agree
- ☐ Strongly Agree

▼ Section D: Internet Accessibility

*** I have reliable internet access at my residence.**

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neutral
- ☐ Agree
- ☐ Strongly Agree

*** Internet connectivity at my residence supports online learning.**

- ☐ Strongly Disagree

- ☐ Disagree
- ☐ Neutral
- ☐ Agree
- ☐ Strongly Agree

*** I can easily access online academic resources from my residence.**

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neutral
- ☐ Agree
- ☐ Strongly Agree

▼ Section E: Academic Performance

*** What is your current CGPA?**

- ☐ Below 2.0
- ☐ 2.0–2.99
- ☐ 3.0–3.59
- ☐ 3.6–4.39
- ☐ 4.4–5.0

*** Has your place of residence affected your academic performance?**

- ☐ Very Negatively
- ☐ Negatively
- ☐ No Effect
- ☐ Positively
- ☐ Very Positively

*** Overall, I believe my place of residence contributes to my academic performance.**

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neutral

- Agree
- Strongly Agree