

An Analytical Comparison Of Resident Versus Non-Resident Students' Academic Performance In General And Additional Mathematics For Grade 10 Students At President's College

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Abstract

The study investigated and compared disparities in the academic performance of both resident and non-resident Grade 10 students in their General Mathematics and Additional Mathematics examinations at President's College. The study sample comprised 145 participants, and both quantitative and qualitative data collection methods were employed. The quantitative data collected comprised students' examination scores over three terms, and the results were further analysed using statistical methods such as Logistic Regression, MANOVA, MANCOVA, Discriminant Analysis, Cluster Analysis, Independent-Samples T-Tests, and Chi-Square Tests. The results showed a significant difference in General Mathematics between resident and non-resident students, with residents outperforming non-residents. However, no significant difference was found to be related to residency status in Additional Mathematics; thus, residency status seems to affect different subjects differently. By conducting and executing the research, it was hypothesised that it would reveal and better address the factors that lead to disparities in the performance of students, generating better insights into the subject and eventually leading to the betterment of education.

Keywords: *Academic Performance, Resident Students, Additional Mathematics, Census Method, General Mathematics*

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I. Introduction

Achievement in mathematics is a major indicator of student success in general education (Park et al., 2022). Courses like General and Additional Mathematics demand that students handle complicated concepts, which are essential to most careers in science, technology, engineering, and mathematics (STEM). The aspects that contribute to academic success, including socioeconomic status, educational resources accessibility, extracurricular activities, and even psychological well-being, have been studied by educational researchers long enough (Alboaneen et al., 2022). Such aspects help in how students approach their studies, cope with academic problems, and finally achieve in exams. Residency status proves to be one of the aspects that has been under-researched concerning academic performance, especially among high school students. Residency status is likely to determine the resources, supports, and the general quality of engagement in academic life of the students (Abizada et al., 2020). As an example, resident students are usually better equipped with access to on-campus resources, study groups, and a more organised learning environment, whereas non-resident students, who live a distance, may face various challenges, including the lack of access to these resources.

The effect of residency status on academic performance in the environment of studying General and Additional Mathematics is little researched, particularly in the Guyanese educational system. Students at President's College have diverse residential backgrounds, and this might be a factor that leads to variations in academic performance. Knowledge about the role of residency status in influencing the academic performance of students, particularly in difficult courses such as mathematics, is essential for the formulation of more specific education assistance. The differences between resident and non-resident students are observed in factors such as resource access, social support network, and extracurricular activities (Son & Cho, 2020).

Residency status of students, especially the difference between resident and non-resident students of President's College, can affect their academic performance. Although studies have been conducted to determine the connection between residency and academic performance in other educational settings, limited studies have been conducted in the particular setting of President's College. Consequently, it is important to analyse the findings on whether there are differences in academic performance between resident and non-resident students in

General and Additional Mathematics. Moreover, this research aims to determine the existence of underlying factors, including resources, social support, and psychological well-being, that could possibly be the cause of these gaps. However, regardless of the focus on these topics, it is not clear whether the performance is affected by the residency status. The research will be beneficial in offering information to specific interventions and also inform educational policies at President's College.

The current research is conducted due to an existing gap in the perception of the effect of the residency status on the academic performance of students in President's College. Although the past studies have captured the residency and academic outcomes in general settings, there is a lack of specific data used in this institution. Due to the special dynamics at President's College whereby the resident students are living in campuses and the non-residents are commuting to the college, it is important to examine whether these distinctions affect the performance in core subjects such as General and Additional Mathematics. This study is important in that it may help establish useful information about the factors that affect academic performance at President's College, especially regarding the issue of residency status.

The study provides practical information that can be applicable in influencing the policy decisions in the college through the identification of any differences between the resident and non-resident students. These findings can help educational administrators and policymakers invest resources more efficiently and create specific support programs that both groups would need to satisfy their needs. Additionally, the research will be part of the developing sphere of studies about educational equity that fosters the notion that the success of students depends on a multifaceted set of factors, including living conditions. These findings have an implication that is not limited to President's College, as other institutions that share the same predicament can utilise the findings to enhance their educational setting and provisions. Moreover, the findings of the study will assist in making sure that all students, irrespective of their status concerning residency, have equal opportunities to attain success in their academics.

II. Literature Review

Theoretical Framework

The Social Learning Theory (Bandura, 1977) provides a solid approach in explaining the academic achievement of the resident and non-resident students. Bandura states that people receive social learning in terms of observation, imitation, and modelling, whereby the behavior is either reinforced by positive or negative effects. The theory is especially applicable in the context of this study, which looks at the role played by the residency status in academic achievement. The resident students who are staying on campus are probably surrounded by peer support services, study groups, and faculty contacts that provide better learning opportunities. The social learning experiences can result in improved academic performance, ensuring in making it easier to engage in uninterrupted peer interaction and access to educational materials (Deliens et al., 2013).

Conversely, non-resident students who travel to campus could experience issues with their access to study groups, stress, and time management because of commuting to campus, which negatively impacts their academic performance (Alordiah et al., 2015). Moreover, based on studies, peer interactions, whether in or out of the classroom, are a major factor influencing academic behavior and motivation in students based on social learning (Malabayabas et al., 2022). The resident students are exposed to these positive academic role models more, and hence, they may have better learning results. In this way, the Social Learning Theory indicates the significance of the social setting and environment, including the status of residency, to academic success and achievement in President's College.

Hypothesis Development

H1: There is a significant difference in academic performance between resident and non-resident students at President's College for General and Additional Mathematics

The body of literature on the influence of residency status on academic performance shows contradictory results, with several studies coming up with significant issues that can be attributed to the disparities in the outcomes between resident and non-resident students. Alordiah et al. (2015) discovered that academic performance in mathematics is greatly influenced by gender, socioeconomic status, and the location of the school. The result shows that social and environmental factors influence academic performance.

Similarly, a study by Paclipan and Jomoad (2020) indicates that family support, parental supervision, and financial stability are significant factors in determining student achievement, which supports the notion that influences outside of the school environment can affect the success of students. Additionally, Kalloo and Mohan (2012) recommend that a physical learning environment, such as mobile learning tools, may be used to enhance academic performance, especially in mathematics. These results prove the hypothesis that residential students, due to their proximity to school resources, can have an explicit advantage in terms of access to academic support and extracurricular activities, resulting in improved performance in subjects such as General and Additional Mathematics. This finding is also supported by other studies, including Dabiah Alboaneen et al. (2022), who

reported that the resources and social issues related to the family, including the level of education of parents, had a great influence on the academic performance of students.

Moreover, some studies that address the importance of residency status did not reveal any meaningful difference between resident and non-resident students. As an illustration, the study conducted by Abizada et al. (2020) acknowledged the influence of extracurricular activity on academic success, but the nature of the residence or place of living did not have a significant impact on academic success. The latter is supported by Alboaneen et al. (2022), who hypothesised the academic (midterm test scores) over the demographic (residency) and social (social factors) variables. In a similar vein, Firmansyah et al. (2022) proposed that the decisive factors that affected academic outcomes were the academic support, teaching methodology, and engagement during classes, rather than the reasons why the students stayed on campus or not.

The conflicting results are indicative of the difficulty of the connection between residency status and academic results, and different variables interact to determine student achievements. Although it can be assumed that the status of a resident has advantages in the sense of access to resources, the evidence is not decisive, and other characteristics are likely to have a greater impact on academic outcomes in President's College, including socioeconomic background and social support (Malabayabas et al., 2022; Perlito & Maxima, 2020; Son & Cho, 2020). This brings out the fact that there should be a delicate approach in analysing the dynamics that can help in academic performance in various groups of students.

III. Methods

Research Approach

The study is based on quantitative research, offering a deeper perspective on academic performance. Quantitative research involves measurable variables such as attendance at school, performance in the General and Additional Mathematics, among other pertinent variables, whereas qualitative research supplements these results by collecting in-depth information about the views and experiences of students (Streefkerk, 2023).

The quantitative design is intended to provide an objective analysis that is understandable, and uses numerically measurable variables, such as grades and attendance in students. This methodology is used to examine the association between the residency status, academic performance, and other variables like the socioeconomic status, access to resources, as well as extracurricular activities.

Data Collection

The data on the academic performance and attendance of students were secondary data. All data collected at President's College records contained the grades and attendance of 145 students in a period of 4 years, consisting of 12 terms. This was tabulated in an Excel sheet, which gives a clear picture of the performance of students in General and Additional Mathematics at various times. Also, the student's register was checked for consistency of attendance.

In order to collect primary data, a questionnaire was created that included closed-ended questions. The questionnaire sought to elicit diverse variables that could affect academic outcomes, which include access to resources, extracurricular activities, social support, psychological health, and the attitude of students towards their learning experiences.

The sample size of 145 students was chosen as the target population was Form 4 students of President's College. Since the population is manageable, the census method was utilised, and all students of Form 4 participated in the research. The reason behind this method is to have a full and proper representation of the entire cohort population, which eliminates sampling errors and presents information that can be directly related to the entire population.

Sampling

This study used a census method because the population of 145 students was utilized. This method ensured that all of the students in the Form 4 group at President's College were covered by the study, ensuring that the results were very precise and reflective of the student group. The census method removes sampling errors because all the members of the target population are used in the study. The sample size was not large, implying to incorporate all the students would give a clear and holistic picture of the factors influencing academic performance. The sample size of all students made it possible to understand the effect of the residency status (resident and non-resident students) on academic performance in General and Additional Mathematics in a more nuanced manner.

Data Analysis

The analysis of the gathered data rests on a mixture of statistical methods, such as Logistic Regression, MANOVA, MANCOVA, Discriminant Analysis, Cluster Analysis, and Chi-square tests. The main objective is to evaluate the correlation between the residency status and academic performance of General and Additional

Mathematics. The logistic regression is used to establish the likelihood of the students outperforming or underperforming the mean score, depending on a combination of different variables such as the residency status, attendance, and other demographic factors. MANOVA compares the concurrent influence of several independent variables on academic performance, whereas MANCOVA considers attendance as the covariate variable (Hair et al. 2019a). The students are considered successful or not successful according to the relevant academic performance, which is discriminant analysis (Hair et al. 2019b). Cluster analysis recognises the unique groups of students in accordance with their performances and demographics (Johnson & Wichern, 2019). The chi-square tests determine relationships among categorical variables such as the status of residence and performance (Chase & Bown, 1997). SPSS, RStudio, and Minitab are all used to perform all the statistical analyses to provide a robust result. Additionally, the Independent Sample t-test and the descriptive statistical plots are used in the analysis in order to consider the data in a more detailed way and guarantee the statistical rigor and visual depiction of the tendencies in order to interpret them better.

IV. Results

Logistic Regression Analysis

Hypotheses

- **Null Hypothesis (H₀):** There is no statistically significant relationship between Residency Status and academic performance (GMTA and AMTA)
- **Alternative Hypothesis (H_a):** There is a statistically significant relationship between Residency Status and academic performance

Table 1: Model Summary for General Mathematics (GMTA):

Model	R	R Square	Adjusted R-Square	Std. Error of the Estimate	Durbin-Watson
1	.000a	.000	-.007	1.00716855	1.777

The Model Summary for General Mathematics (GMTA) shows that the R-value for the model is 0.000, which is an indication that there is no linear association between the independent variables and the performance of the students in GMTA. The R-squared value is also 0.000, which means that the model fails to explain any variance in the performance of the students. The Adjusted R-Square value of -0.007 also supports the fact that the model does not change or improve when adjusted for the number of predictors. The standard error of the estimate (1.007) is an indication of the average distance between the observed and predicted values, while the Durbin-Watson statistic of 1.777 shows that there is no significant autocorrelation in the residuals.

MANOVA (Multivariate Analysis of Variance)

Hypotheses

- **Null Hypothesis (H₀):** There is no significant difference in academic performance (GMTA vs AMTA) between groups based on factors such as residency status and gender
- **Alternative Hypothesis (H_a):** There are significant differences in academic performance based on the aforementioned factors.

Assumptions of MANOVA

MANOVA assumes that the data are normally distributed and the covariance matrices are equal. The same between groups, and the observations are independent.

Normality Testing:

The tests of normality of the data were conducted using the Kolmogorov-Smirnov test and the Shapiro-Wilk test.

Variable	p-value	Interpretation
Residency Status	0.081	No significant effect on academic performance
Sex	0.002	Significant effect on academic performance

The results of the MANOVA show that gender is a strong factor in academic performance, in this case, the GMTA variable, with a p-value of 0.002. This indicates that there is a big difference between the levels of performance of male and female students in GMTA. Nevertheless, the status of residency did not produce any significant impact on the academic performance indicators (GMTA and AMTA), with a p-value of 0.081.

MANCOVA

Hypotheses

- **Null Hypothesis (H₀):** The effects of residency status on academic performance are not significantly influenced by attendance across the three terms.
- **Alternative Hypothesis (H_a):** The effects of residency status on academic performance are significantly influenced by attendance across the three terms.

Assumptions of MANCOVA

MANCOVA has the same set of assumptions as MANOVA, but it also assumes that the covariates (e.g., attendance) have no error measurement. On average, the analysis indicated that the residency status did not have a significant impact on academic performance, with the adjusted R-squared values being insignificant after the adjustment for attendance. This indicates that attendance is a factor that is important factor, though it does not play a significant role in mediating the relationship between residency status and academic performance.

Linear Discriminant Analysis

Hypotheses

- **Null Hypothesis (H₀):** The Mahalanobis T-distance-based classification does not significantly differentiate between 'Not Successful' and 'Successful' students.
- **Alternative Hypothesis (H_a):** The Mahalanobis T-distance-based classification significantly differentiates between 'Not Successful' and 'Successful' students.

Assumptions of LDA:

LDA is based on the assumptions of the data being normally distributed, that the covariance matrices of the groups are identical, and that the groups are independent.

Table 2: LDA Results Summary

Accuracy	69.7%
Precision	92.7%
Recall	70.6%
F1 Score	0.319

The overall accuracy of the model was 69.7%, which implied that the model was accurate in classifying about 70% of the observations. The hit or accurate situation in predicting successful students was very high (92.7%), whereas the recall was lower (70.6%). The F1 of 0.319 means that there is a large imbalance in the classification of both the successful and unsuccessful students. The model can be optimised to enhance the management of the class imbalance.

Cluster Analysis

Cluster analysis is employed to cluster similar data points according to some characteristic, and this is used to determine natural clusters in the data. The technique applied in this case was the hierarchical clustering and the Ward method in particular.

Assumptions of Cluster Analysis

- **Type of Data and Scaling:** Categorical and numerical variables were properly encoded and standardised.
- **Distance Metric:** The dissimilarity among observations was measured by means of Squared Euclidean distance.

Hierarchical Cluster Analysis:

The hierarchical clustering was done in such a way that there was division of the data into three different groups, and the aid of a dendrogram helped in decision making of the number of clusters.

Table 3: Cluster Analysis

Cluster	GMT1 S	GMT2 S	GMT3 S	AMT1 S	AMT2 S	AMT3 S	Residency Status a	Sex 1
1	0.96974	-0.31306	-2.60132	0.72274	0.15921	-3.32458	0	0
2	0.96974	2.33984	1.87010	0.62050	1.71508	1.25891	0	1
3	-0.17176	-3.18705	0.37963	-1.52656	-0.09309	1.65748	0	1

Cluster Center Interpretation:

The hierarchical cluster analysis results revealed three distinct clusters of the data according to the standardised scores of academic performances (GMT1 S, GMT2 S, GMT3 S, AMT1 S, AMT2 S, AMT3 S), the residency status, and gender. Cluster 1 comprises the students who have moderate values of most of the academic performance variables but have lower values of AMT3_S and GMT3_S, showing a balanced and not very high academic performance across the terms. Cluster 2 is a group with more excellent performance on the majority of academic measures, with a significant difference between GMT2 S and AMT2 S, and skewed gender representation, which is denoted by Sex 1. Cluster 3 has a more diversified academic performance profile with a negative deviation and a positive deviation, indicating a less stable academic performance. The status of residency in all clusters is primarily 0, which implies that residency status did not significantly distinguish the clusters.

Independent Sample T-Test

Hypotheses

- **Null Hypothesis (H₀):** There is no significant difference in academic performance (GMTA, AMTA) between residents and non-residents
- **Alternative Hypothesis (H_a):** There is a significant difference in academic performance (GMTA, AMTA) between residents and non-residents

Assumptions of the T-Test

The independent sample t -test is based on the assumption that the data is normally distributed, variances are homogeneous, and the groups are independent.

Group	N	Mean	Std. Deviation	Std. Error Mean
Resident	71	69.98	9.30	1.10
Non-Resident	74	66.95	7.84	0.91
Levene's Test	t-test for Equality of Means			
F	Sig.			
1.371	.244			

The independent sample t -test determines whether the GMTA scores vary significantly between the "Resident" and the "Non-Resident" groups. The descriptive statistics indicate that the mean of the GMTA score of the "Resident" group (69.98) is higher than that of the "Non-Resident" group (66.95), and that the standard deviation of the first group is slightly greater. The p-value of the Test of equality of variances is 0.244, and it shows that the assumption of equal variances is not violated. The t-test value indicates that there is a statistically significant difference (p = 0.036) between the Resident and Non-Resident groups, indicating that the mean difference in the GMTA scores between the two groups (Resident and Non-Resident) is 3.02 points. The result here shows that the influence of residency status on academic performance in this instance is quantifiable.

Table 4: T-Test Results for Additional Mathematics (AMTA):

Group	N	Mean	Std. Deviation	Std. Error Mean
Resident	71	73.74	6.38	0.76
Non-Resident	74	72.31	6.89	0.80
Levene's Test	t-test for Equality of Means			
F	Sig.			
1.010	.317			

Additional Mathematics (AMTA) is a t-test which is independent because the performances of two groups, Resident and Non-Resident, are compared. As demonstrated in the descriptive statistics, the mean score of the group of residents (73.74) is slightly higher than that of Non-Residents (72.31). The test of equality of variances of the Levene statistic has a p-value of 0.317, and this means that the assumption of equal variances is satisfied. The t-test outcome indicates that the p-value is 0.197, which is higher than the usual level of significance 0.05. Hence, the additional mathematics performance of residents and non-residents is not statistically significant, implying that the residency status does not have an effect on AMTA scores.

Chi-Square Test Analysis

Hypotheses

- **Null Hypothesis (H₀):** There is no association between categorical variables such as residency status and academic performance.
- **Alternative Hypothesis (H_a):** There is a significant association between categorical variables such as residency status and academic performance.

Table 5: Chi-Square Results for GMTA and Other Categorical Variables

Variable Pair	Chi-Square Statistic	Degrees of Freedom	p-value
GMTA vs. R NR	6.8004	3	0.078539
GMTA vs. Sex	0.28382	1	0.59421
GMTA vs. Rating Acad Perf	4.3236	4	0.36398
GMTA vs. Avail Lib Res	5.5268	5	0.35502

The p-values of most pairs of variables exceeded 0.05, which indicated no significant correlation between such variables as GMTA and residency status, sex, academic performance rating, and library resources. In AMTA vs. Sex, however, the p-value was 0.0187, which shows that gender and AMTA performance are statistically significant.

V. Discussion

According to the findings of the study, the influence of residency status is prominent in academic performance in GMTA, where the resident students scored higher by 3.02 points compared to non-residents. This is the same conclusion as that of the Social Learning Theory, which emphasises the role of social situations and interpersonal relationships in influencing learning behaviors. The students who are in residence have the advantage of better social learning because they have easy access to on-campus resources like study groups, faculty, and academic support services. These interactions create a positive learning atmosphere, which builds cooperation and interaction that eventually results in improved academic success (Deliens et al., 2013).

Conversely, non-resident students, who might experience logistical issues between commuting and other things, do not receive the same extent of peer support and academic interaction. Their restricted exposure to campus resources can make them less successful in their academic performance in such subject areas as General Mathematics that presuppose active engagement and active cooperation (Alordiah et al., 2015). This observation highlights the need to have environments that promote social interaction and support for all students, irrespective of their status on residency.

Additionally, the study did not observe any meaningful differences in the performance of AMTA in resident and non-resident students. This insinuates that not all academic subjects can be affected by residency status equally. One of the possible causes of this discrepancy is the Social Learning Theory. In a field such as General Mathematics, where team learning and peer support are quite vital, the physical presence of students on campus is an important determinant of academic behaviors (Pal Baliyan & Khama, 2020). Conversely, Additional Mathematics might be less affected by the distance to the on-campus resources because it might be more of an effort and self-control (Malabayabas et al., 2022). This points out the fact that the effects of the status of residency on academic performance will differ in different subjects, and other factors like individual study habits and self-motivation can come out more strongly in some subjects.

Gender was also identified by the study as a significant determinant in academic performance in academics, especially in General Mathematics. These results are consistent with the past literature, indicating that academic performance can be influenced by socialisation and expectations of learning by gender (Son & Cho, 2020). Male students can have an academic environment that stimulates greater engagement, which might lead to their better performance in mathematics (Dabiah Alboaneen et al., 2022). This indicates why educational institutions should respond to gender inequalities in academic performance by facilitating gender sensitive instructional methods that foster equal participation and educational performance of the students. The Social Learning Theory substantiates this point since it focuses on the influence of social settings on developing behaviors and learning outcomes.

Various implications can be made based on the findings of this study because the residency status has been found to influence academic performance, in that the institution must take into account the need to offer extra support to the non-resident students who might experience difficulties accessing the on-campus resources. This may involve providing online learning communities, increasing access to learning materials online, and increasing faculty presence in remote consultations. Moreover, because gender differences were established to affect academic performance, the college must consider the application of gender-sensitive methods of teaching.

Educators must establish learning conditions that help in providing equal participation of male and female students, especially in mathematics, where gender discrepancies tend to appear. On the other hand, it can be argued that, based on the results, the changes can be made to enhance the academic performance of every student, irrespective of their residency and gender. By bringing up these inequalities, President's College will be able to foster a higher level of academic equity, where every student can get the support needed.

VI. Conclusion

This study examined how the residency status influences the academic achievement of Grade 10 students at President's College, that is, in General and Additional Mathematics. The results indicate that residency status had a greater influence on academic achievement in General Mathematics, with resident students achieving a higher academic outcome compared to the non-residents by 3.02. However, there was no significant difference between the two groups in terms of Additional Mathematics performance. Gender was also revealed as another important determinant of academic achievement. The findings further indicated that the status of the resident affects the achievement of academic success in subjects that have a need to have peer interactions and support, like General Mathematics.

Limitations

The cross-sectional nature of the study was its main weakness, as it only gives a picture of the performance of the students in academics. Even though the residency status was investigated, other possible factors, including the family background or personal study habits, were not examined thoroughly. Moreover, the research was done in only one institution, thereby restricting the applicability of the results. The sample size was

adequate, but the study was restricted to one academic year, and therefore, it was limited to comprehending the long-term trends. Finally, some of the variables require self-reported data, which can lead to bias in the findings.

Future Implications

Longitudinal studies should be taken into account in the future in order to monitor the changes in academic performance over time and the long-term results of educational outcomes in the case of residency status. The coverage of a wider set of schools would give a more in-depth picture of what drives academic success. More research should be conducted on the importance of extracurricular activities, study habits, and psychological state. The relationship between gender differences and other variables, including residency status, should be investigated in the future to determine their influence on academic achievement. Additionally, learning institutions need to come up with specific interventions using these findings to improve the assistance offered to non-resident students.

References

- [1]. Abizada, A., Gurbanova, U., Iskandarova, A., & Nadirzada, N. (2020). The Effect Of Extracurricular Activities On Academic Performance In Secondary School: The Case Of Azerbaijan. *International Review Of Education*, 66(4), 487–507. <https://doi.org/10.1007/S11159-020-09833-2>
- [2]. Agresti, A. (2013a). Building And Applying Logistic Regression Models. In *Categorical Data Analysis* (Pp. 246–247). Essay, John Wiley & Sons (Etc.).
- [3]. Agresti, A. (2013b). Logistic Regression. In *Categorical Data Analysis* (Pp. 165–210). Essay, John Wiley & Sons (Etc.).
- [4]. Alboaneen, D., Almelih, M., Alsubaie, R., Alghamdi, R., Alshehri, L., & Alharthi, R. (2022). Development Of A Web-Based Prediction System For Students' Academic Performance. *Data*, 7(2), 21. <https://doi.org/10.3390/Data7020021>
- [5]. Alordiah, C. O., Akpadaka, G., & Oviogbodun, C. O. (2015). The Influence Of Gender, School Location And Socio-Economic Status On Students' Academic Achievement In Mathematics, 6 (17)(2015), 130–136. <https://doi.org/https://files.eric.ed.gov/fulltext/EJ1079759.pdf>
- [6]. Chase, & Bown, F. (1997). Analysis Of Categorical Data-Chi-Square Test For Goodness Of Fit. In *General Statistics* (Pp. 465–473). Essay, John Wiley And Sons.
- [7]. Deliens, T., Clarys, P., De Bourdeaudhuij, I., & Deforche, B. (2013). Weight, Socio-Demographics, And Health Behaviour Related Correlates Of Academic Performance In First Year University Students. *Nutrition Journal*, 12(1). <https://doi.org/10.1186/1475-2891-12-162>
- [8]. Firmansyah, F. F., Sa'dijah, C., Subanji, S., & Qohar, Abd. (2022). Characterizations Of Students' Metacognition In Solving Geometry Problems Through Positioning Group Work. *TEM Journal*, 1391–1398. <https://doi.org/10.18421/Tem113-50>
- [9]. Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019a). MANOVA And GLM. In *Multivariate Data Analysis* (Pp. 342–404). Essay, Cengage.
- [10]. Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019b). Multiple Discriminant Analysis. In *Multivariate Data Analysis* (Pp. 232–313). Essay, Cengage.
- [11]. Johnson, R. A., & Wichern, D. W. (2019). Clustering, Distance Methods And Ordination. In *Applied Multivariate Statistical Analysis*. Essay, Pearson India Education Services.
- [12]. Kalloo, V., & Mohan, P. (2012). Mobilemath: An Innovative Solution To The Problem Of Poor Mathematics Performance In The Caribbean, 2 (1)(2012), 5–18. <https://doi.org/https://journals.sta.uwi.edu/ojs/index.php/cts/article/view/27/25>
- [13]. Malabayabas, M. E., Torres, P. C., Sapin, S. B., & Tamban, V. E. (2022). Mathematics Performance, Academic Well-Being, And Educational Aspirations Of Junior High School Students. *International Journal On Research In STEM Education*, 4(2), 87–102. <https://doi.org/10.31098/Ijrse.V4i2.1123>
- [14]. Paclipan, M. O., & Jomud, P. D. (2020). Relationship Between Family And School Factors And The Students' Academic Performance In Mathematics, 7 (4)(June 2023; 10 (2)). <https://doi.org/https://doi.org/10.15739/IJEPRR.20.014>
- [15]. Pal Baliyan, S., & Khama, D. (2020). How Distance To School And Study Hours After School Influence Students' Performance In Mathematics And English: A Comparative Analysis. *Journal Of Education And E-Learning Research*, 7(2), 209–217. <https://doi.org/10.20448/Journal.509.2020.72.209.217>
- [16]. Park, S., Dotan, P. L., & Esposito, A. G. (2022). Do Executive Functions Gained Through Two-Way
- [17]. Dual-Language Education Translate Into Math Achievement? *International Journal Of Bilingual Education And Bilingualism*, 26(4), 1–15. <https://doi.org/10.1080/13670050.2022.2116973>
- [18]. Son, B., & Cho, Y. (2020). An Analysis On Factors That Affect Academic Achievement In Globalized Environment. *Journal Of Industrial Distribution & Business*, 11(6), 7–17. <https://doi.org/10.13106/Jidb.2020.Vol11.No6.7>
- [19]. Streefkerk, R. (2023, June 22). Qualitative Vs. Quantitative Research: Differences, Examples & Methods. Scribbr. <https://www.scribbr.com/methodology/qualitative-quantitative-research/>