

Students' Perception of the Campus Environment in the Context of Urban Morphology: A Case Study at Gorontalo State University in Gorontalo Urban Area

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Abstract

This study aims to analyze the influence of campus environment and urban morphology on students' perceptions in understanding spatial dynamics and learning comfort in the urban area of Gorontalo. A quantitative approach was used involving 172 respondents from Gorontalo State University. Data were collected through a survey with a Likert scale and analyzed using multiple linear regression to test the influence of campus environment (X_1) and urban morphology (X_2) variables on student perception (Y). The results of the analysis showed that the two independent variables had a positive and significant effect on student perception. The regression equation obtained $Y = 1.645 + 0.208X_1 + 0.556X_2$ with a simultaneous significance value (F -test) < 0.001 , showing that the campus environment and urban morphology together affect student perception. The classical assumption test also showed that normality was fulfilled, there was no multicollinearity ($VIF < 10$), and heteroscedasticity was not detected. These findings show that the quality of campus physical space that is in sync with the morphological characteristics of the city can form a more positive, contextual, and reflective learning experience for students. This study recommends the importance of campus planning based on urban morphology and spatial interaction to strengthen the quality of the higher education environment in urban areas.

Keyword: Student Perception, Campus Environment, City Morphology, Learning Comfort, Gorontalo City



INTRODUCTION

In the last two decades, the development of medium-sized cities in Indonesia has undergone an increasingly complex transformation, including in Gorontalo City as a center of higher education activities and regional urbanization. Gorontalo State University (UNG), as an educational institution that occupies a strategic position in the city's morphology network. The campus environment as part of the higher education system has a dual role: as an academic space and as a representation of urban morphology that reflects urban life patterns (Carmona et al., 2021).

In the context of Gorontalo State University (UNG), the integration between the campus structure and the characteristics of the city of Gorontalo becomes interesting to study, given the dynamics of rapid urban growth and significant spatial changes in the last decade (Rahim et al., 2020). Students' perceptions of the campus environment not only reflect physical comfort, but also social interaction, architectural aesthetics, and spatial accessibility (Haryono et al., 2021).

From the perspective of urban morphology, the relationship between physical structure and social perception is now understood as a result of the dynamic interaction between spatial forms and human cognitive constructions of space. A number of recent studies confirm that morphological configurations including road connectivity, spatial order, and visual quality of the landscape affect users' perception of identity and social attachment to places (Karimi et al., 2021; Mehaffy et al., 2020). In the context of the campus environment, students' perceptions of space are not only determined by physical attributes such as building layout, green open spaces, or visual cohesion, but also by cognitive, emotional, and social experiences formed through daily interactions (Jiang et al., 2023; Zhang & Zhao, 2022).

Various previous studies have emphasized the relationship between the morphological design of cities and the behavior of space users (Montgomery, 2020; Mehaffy, 2022). Nevertheless, a number of studies show that universities in developing cities often face disintegration between campus design and the structure of the surrounding city. Then research linking city morphology with student perception is still minimal, especially in the Indonesian context, especially in the Gorontalo area. This gap shows that higher education spaces are not yet fully seen as an integral part of the urban system (Sari & Nugroho, 2021). Therefore, this study is focused on examining how the variables of the campus environment and urban morphology affect student perception, both partially and simultaneously.

METHOD

This study uses an inferential quantitative approach with *an ex post facto design*. This



approach aims to test the relationship between variables based on data that has occurred without manipulation of independent variables (Creswell & Creswell, 2018; Everitt & Howell, 2016). The inferential quantitative approach allows researchers to draw general conclusions (*generalizations*) from the sample to the population on the basis of statistical hypothesis testing. The research population is Gorontalo State University students who are active in the 2025/2026 academic year, with a sample of 172 respondents taken through *proportionate stratified random sampling techniques*. The instrument was in the form of a Likert questionnaire 1–5 that measured three variables: campus environment (X_1), urban morphology (X_2), and student perception (Y).

Data analysis was carried out using classical assumption tests including the Kolmogorov-Smirnov normality test (Asymp. Sig. = 0.086 > 0.05), multicollinearity test (Tolerance > 0.10; VIF < 10), and the Glejser heteroscedasticity test (Sig. > 0.05), showed the fulfillment of classical assumptions. Next, multiple linear regression analysis was carried out with the following equations:

$$Y = 1.645 + 0.208X_1 + 0.556X_2$$

The determination coefficient (R^2) shows the proportion of variation in student perception explained by the campus environment and city morphology of 86.4%. The t-test yielded a significant value of < 0.05 for both independent variables, while the F-test showed a value of $F = 537.909$, $p < 0.001$, which means a significant simultaneous influence.

RESULTS AND DISCUSSION

Statistical Analysis Results

1. Normality Test

The Kolmogorov-Smirnov One-Sample Test (K-S Test) is used to find out whether the residual data in the regression model is normally distributed. This test is important because one of the classic assumptions of linear regression is that the residual (prediction error) must be normally distributed in order for the regression parameter estimation results to be valid and unbiased. Here are the test results in the table below:

Table 1. Kolmogorov Smirnov Normality Test Results

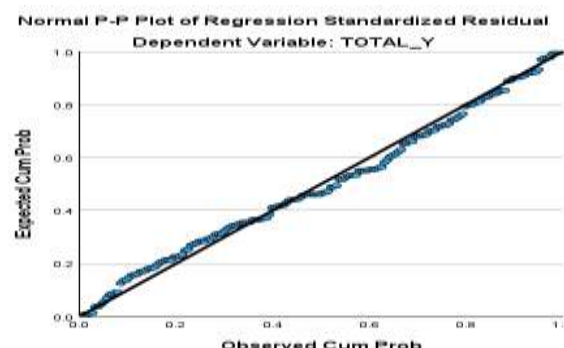
One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
N		172
Normal	Mean	.0000000

Parameters ^{a,b}	Std. Deviation	2.33169087
Most Extreme Differences	Absolute	.064
	Positive	.064
	Negative	-.050
Test Statistic		.064
Asymp. Sig. (2-tailed) ^c		.086
Monte Carlo Sig. (2-tailed) ^d	Sig.	.087
	99% Confidence Interval	Lower Bound .080
		Upper Bound .094
a. Test distribution is Normal.		
b. Calculated from data.		
c. Lilliefors Significance Correction.		
d. Lilliefors' method based on 10000 Monte Carlo samples with starting seed 2000000.		

Source: SPSS 2026 Data Processing

Based on the table above shows that the value of Asymp. Sig. (2-tailed) = 0.086 > 0.05, then residual in the regression model is normally distributed. This is reinforced by the Monte Carlo Sig. result (0.087) which is also greater than 0.05, as well as the absolute deviation value (0.064) which is small and close to zero. Thus, the assumption of normality is met, and the regression model can be continued for significant testing (t-test and F-test) without violating the basic assumption.

Figure 1. Results of the P-Plot Normality Test



Source: SPSS 2026 Data Processing

The Probability–Probability Plot (P–P Plot) normal test is used to visually verify the residual normality assumption in multiple linear regression models. The results of the normality test using the Normal P–P Plot of Regression Standardized Residual graph, it appears that the distribution of residual points spreads around the diagonal line and follows the direction of the normality line. The pattern shows that the residual regression model is normally distributed. These findings are consistent with the results of the Kolmogorov Smirnov test ($p = 0.086 > 0.05$) which also indicates no violation of the assumption of normality.

2. Multicollinearity Test

The multicollinearity test aims to find out whether there is a correlation between independent variables in the regression model. A good regression model should be free of multicollinearity. This test can be seen from the values of Tolerance and Variance Inflation Factor (VIF). Here are the test results in the table below:

Table 2. Multicollinearity Test Results

Coefficients ^a								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.645	.726		2.265	.025		
	TOTAL_X1	.208	.051	.254	4.086	<.001	.207	4.827
	TOTAL_X2	.556	.050	.696	11.175	<.001	.207	4.827

a. Dependent Variable: TOTAL_Y

Source: SPSS 2026 Data Processing

Based on the table above, the values of Tolerance ($0.207 > 0.10$) and VIF ($4.827 < 10$) show that there is no multicollinearity between the X_1 and X_2 variables. That is, the two independent variables stand independently and do not distort each other's influences in the regression model.

3. Heteroscedasticity Test

The heteroscedasticity test aims to find out whether there is a residual variance (error) between observations in the regression model. The Glejser Test method is carried out by regressing the residual absolute value as a dependent variable to an independent variable, if the

test results show a significance value (Sig.) > 0.05, then heteroscedasticity does not occur.

Table 3. Heteroscedasticity Test Results

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.024	.467		4.331	<.001
	TOTAL_X2	.063	.032	.325	1.956	.052
	TOTAL_X1	-.076	.033	-.387	-2.326	.021

a. Dependent Variable: ABS_RES

Source: SPSS 2026 Data Processing

Based on the results of the heteroscedasticity test using the Glejser method, a significance value of 0.052 was obtained for the urban morphology variable (X_2) and 0.021 for the campus environment variable (X_1). Since the significance value of both is around or above 0.05, it can be concluded that the regression model does not experience symptoms of heteroscedasticity.

Multiple Linear Regression Test

The results of multiple linear regression analysis yield the following equation:

$$Y = 1.645 + 0.208X_1 + 0.556X_2$$

The constant of 1,645 indicates that when the variables of campus environment (X_1) and urban morphology (X_2) are assumed to be zero, then the perception of students (Y) still has a positive baseline value of 1,645. The regression coefficient values of X_1 (0.208) and X_2 (0.556) indicate a positive relationship: every one unit increase in the campus environment and urban morphology will increase student perception by 0.208 and 0.556 units, respectively.

Uji Hypothesis

1. Partial Test (t-test)

Table 4. Partial Test Results (t-test)

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.645	.726		2.265	.025

	TOTAL_X2	.556	.050	.696	11.175	<.001
	TOTAL_X1	.208	.051	.254	4.086	<.001
a. Dependent Variable: TOTAL_Y						

Source: SPSS 2026 Data Processing

Partially, the results of the t-test show that:

- The campus environment (X_1) has a t-value of 4.086 with a significance of < 0.001 , meaning that it has a positive and significant effect on student perception.
- The morphology of the city (X_2) shows a t-value of 11,175 with a significance of < 0.001 , which also has a positive and significant effect on student perception.

The standard regression coefficient (β) shows that X_2 ($\beta = 0.696$) exerts a stronger influence than X_1 ($\beta = 0.254$). Thus, it can be concluded that urban morphology has a dominant role in shaping students' perception of the campus environment in the Gorontalo urban area.

2. Simultaneous Test (F Test)

Table 5. Simultaneous Test Results (F Test)

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5918.205	2	2959.102	537.909	<.001 ^b
	Residual	929.690	169	5.501		
	Total	6847.895	171			
a. Dependent Variable: TOTAL_Y						
b. Predictors: (Constant), TOTAL_X1, TOTAL_X2						

Source: SPSS 2026 Data Processing

The results of the F test showed an F value of 537,909 with a significance value of < 0.001 (< 0.05). This indicates that the variables of campus environment (X_1) and urban morphology (X_2) simultaneously have a significant effect on student perception (Y). Thus, this regression model is declared feasible for the analysis of relationships between variables.

DISCUSSION

The results of this study strengthen the hypothesis that the campus environment and urban morphology have a significant positive effect on the perception of Gorontalo State University students. This interpretation is in line with the theory of *urban morphology* which

asserts that the physical structure of the city and spatial elements have a direct influence on the behavior of space users, including students as learning actors (Carmona et al., 2021; Mehaffy, 2022).

The campus environment variable (X_1) plays a role in building students' perception of comfort, safety, and carrying capacity of academic activities. A clean, green, and functional environment encourages emotional attachment to the institution. These findings are consistent with the results of Haryono and Pratama's (2021) research which stated that the quality of campus ecology has a significant effect on the perception of learning comfort.

Meanwhile, the city morphology variable (X_2) showed a stronger influence on student perception. This shows that student perceptions are not only influenced by the internal conditions of the campus, but also by the external context, namely the structure and shape of the city where the campus is located. In the case of Gorontalo State University, the shape of the road network, the existence of public spaces, and land use around the campus contribute to students' perception of accessibility and spatial connectivity (Rahim et al., 2020).

This phenomenon can be explained through the theory of *place attachment* put forward by Lynch (1984), where the perception of space is influenced by the level of emotional and cognitive connectedness to the physical environment. The more harmonious the relationship between the campus and the morphological structure of the city, the higher the level of comfort and positive perception of students. In addition, these results broaden UNESCO's (2023) view that higher education spaces in urban areas should be a sustainable learning ecological system. This means that the morphological design of the city needs to be oriented to support students' academic and social activities, not just as a physical setting. Then these results are in line with the idea by (Trimulato et al., 2023) that students' perceptions of the campus environment are formed through ecological experiences sourced from green spatial planning, adaptive urban morphological systems, and university sustainability policies.

Practically, the findings of this study show that the development of campus spatial planning must pay attention to the integration of urban morphology in order to create learning spaces that are adaptive, contextual, and support *student well-being*. Local governments and universities can collaborate on urban infrastructure planning that is friendly to academic activities, such as transportation access, pedestrian paths, and green open spaces. From a theoretical perspective, these results confirm the importance of a cross-disciplinary approach between architecture, urban planning, and environmental psychology in understanding students' perceptions of urban learning spaces.

CONCLUSION

This study shows that the campus environment and urban morphology have a positive and significant effect on the perception of Gorontalo State University students. A well-organized campus environment and urban morphological structure that supports academic activities increase students' perception of the comfort and effectiveness of learning spaces. The implication is that campus spatial planning needs to be aligned with the morphology of the city in order to create spatial synergy that facilitates academic and social interaction. Further research is suggested to integrate GIS-based spatial approaches and visual perception to strengthen the technological dimension in spatial education studies.

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