Green Space Awareness and Utilisation among University Students in Tanzania: A Correlational Study

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ABSTRACT

This study examines the relationships between demographic characteristics and knowledge levels regarding green spaces among university students. Using quantitative correlation analysis, we surveyed 88 students from Environmental Management and Health System Management programmes at Mzumbe University, Tanzania. Data were collected through structured questionnaires and analyzed using SPSS to determine correlations between variables including age, gender, academic level, domicile type, and green space awareness indicators. Results revealed significant positive correlations between academic level and green space type identification ($r=0.312$, $p<0.05$), access to home green spaces and campus visit frequency ($r=0.445$, $p<0.01$), and rural background with conservation awareness ($r=0.298$, $p<0.05$). Interestingly, knowledge sources showed varying correlations with engagement levels, with academic courses demonstrating the strongest association with conservation participation ($r=0.387$, $p<0.01$). The findings suggest that prior exposure to green environments and educational background significantly influence environmental awareness and engagement behaviors. These insights have important implications for designing targeted environmental education programmes in higher education institutions across developing countries.

Keywords: Green Spaces; Environmental Awareness; University Students; Correlation Analysis; Environmental Education

INTRODUCTION

Green spaces have emerged as vital components of sustainable development, particularly within educational institutions where they serve multiple functions beyond aesthetic appeal. In university settings, these spaces contribute to student well-being, academic performance, and institutional identity while providing essential ecosystem services (Babalola&Raji, 2016). However, the effectiveness of green space conservation and utilization largely depends on users' knowledge, awareness, and behavioral patterns.

Recent studies have highlighted the importance of understanding relationships between demographic factors and environmental consciousness among young adults. Schipperijn and Stigsdotter (2010) demonstrated that individual characteristics significantly influence green space usage patterns, while Monroe et al. (2019) emphasized the role of educational background in shaping environmental behaviors. Despite this growing literature, limited research has specifically examined how demographic variables correlate with green space knowledge and awareness among university students in sub-Saharan Africa.

This study addresses this gap by investigating correlations between various demographic characteristics and green space knowledge indicators among students at Mzumbe University, Tanzania. Understanding these relationships is crucial for developing targeted environmental education programmes and improving green space management strategies in higher education institutions.

The research question guiding this study is: What are the significant correlations between demographic characteristics and green space knowledge levels among university students? The hypothesis states those students' background characteristics, including academic level, domicile type, and prior exposure to green

environments, significantly correlate with their knowledge and engagement levels regarding campus green spaces.

THEORETICAL FRAMEWORK

Green Space Knowledge and Environmental Awareness

Environmental knowledge encompasses both factual understanding and awareness of ecological processes and conservation practices. Guenat *et al.,* (2019) argued that knowledge of ecosystem services varies significantly based on individual experiences and educational exposure. In university contexts, this knowledge directly influences how students perceive, use, and protect green infrastructure. Previous research has identified several factors that influence environmental knowledge acquisition. Kabisch *et al.,* (2015) found that direct experience with natural environments during childhood significantly predicts later environmental awareness and behavior. Similarly, Jennings and Bamkole (2019) demonstrated that access to green spaces correlates positively with environmental consciousness and pro-conservation attitudes.

Demographic Influences on Environmental Awareness

Age and academic progression have been consistently linked to environmental knowledge levels. Markevych et al. (2019) found that older students and those in advanced academic programmes demonstrate greater understanding of ecological concepts. Gender differences in environmental awareness have also been documented, with some studies suggesting that female students tend to show higher concern for environmental issues (Ngo *et al.,* 2022). Geographic background represents another important factor. Students from rural areas often possess traditional ecological knowledge and direct experience with natural systems, potentially influencing their understanding of green space functions (Wangai *et al.,* 2016). Conversely, urban students may have different perspectives shaped by exposure to planned green infrastructure and environmental policies.

Knowledge Sources and Learning Pathways

The pathways through which students acquire environmental knowledge significantly influence their engagement levels. Formal education, particularly environmental science curricula, provides structured learning opportunities (Paul &Kingham, 2017). However, informal learning through peer interactions, campus events, and digital media also plays important roles in knowledge acquisition. Ajaps and McLellan (2015) emphasized that effective environmental education requires multiple learning modalities and sustained engagement. Their findings suggest that students who learn about environmental issues through diverse sources demonstrate higher levels of conservation behavior and awareness.

RESEARCH METHODOLOGY

This study employed a quantitative cross-sectional design to examine correlations between demographic variables and green space knowledge indicators. The research was conducted at Mzumbe University Main Campus, located in Morogoro Region, Tanzania. The campus was selected due to its diverse green infrastructure and student population representing various geographic and socioeconomic backgrounds. Using Yamane's formula with a ten percent margin of error, a sample size of 88 students was calculated from a target population of 690 students in Environmental Management and Health System Management programmes. Simple random sampling using the lottery method ensured representative selection within these programmes. Data were collected through structured questionnaires administered between March and April 2025. The questionnaire included sections on demographic characteristics, green space knowledge indicators, awareness levels, and engagement behaviors. All variables were coded numerically for statistical analysis.

Variables and Measurement

Table 1: Variables and Measurement Scales

Variable Type	Variable Name	Measurement Scale	Coding
Dependent Variables			

	Green space type identification	4-point Likert scale	1=Poor, 2=Fair, 3=Good, 4=Excellent
	Knowledge source diversity index	Continuous	1-6 (number of sources)
	Conservation awareness level	3-point scale	1=Low, 2=Moderate, 3=High
	Visit frequency patterns	5-point scale	1=Never, 2=Rarely, 3=Sometimes, 4=Often, 5=Daily
Independent Variables			
	Age	Continuous	Years
	Gender	Dichotomous	1=Male, 2=Female
	Academic level	Ordinal	1=2nd Year, 2=3rd Year
	Domicile type	Nominal	1=Urban, 2=Rural, 3=Peri-urban
	Access to home green spaces	Dichotomous	1=Yes, 2=No

Source: Field Data

Statistical Analysis

Data analysis was conducted using SPSS version 28.0. Pearson correlation coefficients were calculated to examine linear relationships between continuous variables, while Spearman's rank correlation was used for ordinal and non-parametric data. Chi-square tests assessed associations between categorical variables. Statistical significance was set at $p<0.05$, with effect sizes interpreted using Cohen's conventions.

RESULTS AND DISCUSSION

Respondents Characteristics

The sample comprised 88 students with ages ranging from 20 to 40 years (M=22.8, SD=2.4). Males represented 55.7 percent of respondents, while 44.3 percent were female. Academic distribution was evenly split between second-year (50 percent) and third-year (50 percent) students. Regarding domicile background, 56.8 percent came from rural areas, 39.8 percent from urban areas, and 3.4 percent from peri-urban locations.

Table 2: Demographic Characteristics (N=88)

Characteristic	Category	Frequency (n)	Percentage (%)
Gender	Male	49	55.7
	Female	39	44.3
Academic Level	2nd Year	44	50.0
	3rd Year	44	50.0
Domicile Background	Urban	35	39.8

	Rural	50	56.8
	Peri-urban	3	3.4
Access to Home Green Spaces	Yes	58	65.9
	No	30	34.1
Age	Mean (SD)	22.8 (2.4)	Range: 20-40

Source: Field Data

RESULTS

Table 3: Correlation Matrix of Key Variables

Variable	1	2	3	4	5	6	7	8
1. Academic Level	1.000							
2. Green Space Type ID	0.312**	1.000						
3. Rural Background	0.145	0.187	1.000					
4. Conservation Awareness	0.234*	0.267*	0.298**	1.000				
5. Home Green Access	0.089	0.356**	0.423**	0.201	1.000			
6. Campus Visit Frequency	0.198	0.289*	0.245*	0.334**	0.445**	1.000		
7. Knowledge Sources	0.278**	0.234*	0.156	0.298**	0.167	0.289*	1.000	
8.Conservation Participation	0.289*	0.345**	0.223*	0.456**	0.298**	0.387**	0.387**	1.000

*p < 0.05, **p < 0.01

Source: Field Data

Academic Level and Green Space Knowledge

Analysis revealed a significant positive correlation between academic level and green space type identification (r=0.312, p=0.003). Third-year students demonstrated superior ability to distinguish between different green space categories, with 68 percent correctly identifying botanical gardens compared to 45 percent of second-year students. This finding aligns with cumulative learning theory, suggesting that extended exposure to environmental curricula enhances ecological knowledge.

Table 4: Green Space Knowledge by Academic Level

Knowledge Indicator	2nd Year (n=44)	3rd Year (n=44)	Correlation (r)	p-value
Botanical Garden Identification	45%	68%	0.312**	0.003

Ecosystem Services Understanding	52%	73%	0.298**	0.005
Conservation Practices Awareness	48%	66%	0.267*	0.012
Green Infrastructure Knowledge	41%	61%	0.245*	0.021

*p < 0.05, **p < 0.01

Source: Field Data

The correlation between academic progression and knowledge sources also proved significant (r=0.278, p=0.009). Advanced students reported more diverse learning pathways, incorporating academic courses, research projects, and field experiences. This pattern suggests that higher education effectively builds environmental literacy through multiple exposure channels.

Domicile Background and Environmental Awareness

Rural background showed a strong positive correlation with conservation awareness (r=0.298, p=0.005). Students from rural areas demonstrated higher scores on conservation awareness measures, with 73 percent expressing strong concern for green space protection compared to 52 percent of urban students. This finding supports the childhood nature experience hypothesis proposed by Kabisch *et al.*, (2015), suggesting that early exposure to natural environments fosters lasting environmental consciousness.

Table 5: Conservation Awareness by Domicile Background

Awareness Level	**Urban (n=35)**	**Rural (n=50)**	**Peri-urban (n=3)**	**Total (n=88)**
High	18 (51.4%)	37 (74.0%)	2 (66.7%)	57 (64.8%)
Moderate	12 (34.3%)	11 (22.0%)	1 (33.3%)	24 (27.3%)
Low	5 (14.3%)	2 (4.0%)	0 (0.0%)	7 (8.0%)
Chi-square	$\chi^2 = 6.742$, p = 0.034			

Source: Field Data

Interestingly, domicile type also correlated significantly with visit frequency patterns (r=0.245, p=0.021). Rural students visited campus green spaces more frequently for studying and relaxation, possibly due to familiarity and comfort with outdoor environments.

Access to Home Green Spaces and Campus Engagement

The strongest correlation observed was between access to green spaces at home and frequency of campus green space visits (r=0.445, p<0.001). Students with home access to green environments were 2.3 times more likely to use campus green spaces daily or weekly. This relationship suggests that prior positive experiences with green environments translate into continued engagement in new settings.

Table 6: Campus Green Space Usage by Home Access

Visit Frequency	**Home Access (n=58)**	**No Home Access (n=30)**	**Total (n=88)**
Daily	23 (39.7%)	4 (13.3%)	27 (30.7%)
Weekly	21 (36.2%)	8 (26.7%)	29 (33.0%)

Monthly	10 (17.2%)	12 (40.0%)	22 (25.0%)
Rarely	4 (6.9%)	6 (20.0%)	10 (11.4%)
Total	58 (100%)	30 (100%)	88 (100%)
Chi-square	$\chi^2 = 12.456$, $p = 0.006$		

Source: Field Data

Access to home green spaces also correlated positively with knowledge of green space benefits (r=0.356, p=0.001). Students with home access demonstrated better understanding of ecosystem services, particularly regarding mental health benefits and temperature regulation.

Knowledge Sources and Engagement Behaviors

Academic courses as knowledge sources showed the strongest correlation with conservation participation (r=0.387, p<0.001). Students who learned about green spaces through formal curricula were significantly more likely to participate in tree planting (56 percent vs. 31 percent) and cleanup activities (48 percent vs. 29 percent) compared to those relying primarily on informal sources.

Table 7: Knowledge Sources and Conservation Participation

Knowledge Source	Conservation Participation Rate	Correlation (r)	p-value
Academic Courses	56%	0.387**	<0.001
Research Projects	43%	0.298**	0.005
University Events	38%	0.234*	0.028
Peer Discussions	34%	0.267*	0.012
Social Media	29%	0.156	0.148
Personal Experience	67%	0.423**	<0.001

*p < 0.05, **p < 0.01

Source: Field Data

Word-of-mouth learning correlated moderately with social engagement in green spaces (r=0.267, p=0.012), while university events as knowledge sources correlated with leadership in environmental activities (r=0.234, p=0.028). These findings highlight the importance of diverse educational approaches in fostering different types of environmental engagement.

Gender and Age Correlations

Gender showed weak but significant correlations with specific knowledge indicators. Female students demonstrated slightly higher awareness of mental health benefits (r=0.198, p=0.064), while male students showed stronger correlations with recreational usage patterns (r=0.212, p=0.048).

Table 8: Gender Differences in Green Space Knowledge

Knowledge Indicator	Male (n=49)	Female (n=39)	t-test	p-value
Mental Health Benefits	3.2 ± 0.8	3.6 ± 0.7	-2.456	0.016*

Recreational Usage	3.7 ± 0.9	3.3 ± 0.8	2.178	0.032*
Ecosystem Services	3.1 ± 0.9	3.4 ± 0.8	-1.634	0.106
Conservation Practices	3.3 ± 0.8	3.5 ± 0.7	-1.289	0.201

*p < 0.05

Source: Field Data

Age correlated positively with overall environmental awareness (r=0.289, p=0.006), suggesting that maturity and life experience contribute to environmental consciousness beyond formal education.

Multiple Correlation Analysis

Multiple regression analysis revealed that the combination of academic level, rural background, and home green space access explained 34.2 percent of variance in overall green space knowledge scores (R^2=0.342, F(3,84)=14.6, p<0.001). This substantial explained variance suggests that these demographic factors are important predictors of environmental knowledge among university students.

Table 9: Multiple Regression Analysis Results

Predictor Variable	B	SE B	β	t	p-value
Academic Level	0.456	0.134	0.298**	3.403	0.001
Rural Background	0.387	0.145	0.245*	2.669	0.009
Home Green Access	0.523	0.156	0.312**	3.353	0.001
(Constant)	1.234	0.234		5.274	<0.001

Model Summary: R^2 = 0.342, Adjusted R^2 = 0.318, F(3,84) = 14.6, p < 0.001

*p < 0.05, **p < 0.01

Source: Field Data

DISCUSSION OF FINDINGS

Theoretical Implications

The correlation patterns observed in this study provide strong support for experiential learning theory in environmental education. The significant relationships between prior exposure (home access, rural background) and current knowledge levels suggest that direct experience with natural environments creates lasting cognitive and behavioral foundations. The progressive increase in knowledge complexity with academic advancement supports Bloom's taxonomy of learning, indicating that environmental education builds hierarchically from basic awareness to sophisticated understanding of ecological relationships.

Implications for Environmental Education

The strong correlation between academic courses and conservation participation (r=0.387) suggests that formal environmental education effectively translates knowledge into action. Universities should therefore prioritize integration of hands-on environmental components across curricula, not limiting such content to environmental science programmes alone. The rural-urban knowledge gap indicates need for differentiated educational approaches. Urban students may benefit from experiential learning opportunities that rural students naturally possess, while rural students might need exposure to formal conservation concepts and policy frameworks.

Policy Recommendations

Based on correlation findings, several policy implications emerge. First, diversified learning pathways are essential since different knowledge sources correlate with varying engagement types, suggesting that effective environmental education requires multiple delivery mechanisms rather than relying solely on formal instruction. Second, early intervention programmes are needed because the strong correlation between childhood exposure and current awareness supports implementation of environmental education programmes at earlier educational levels to build foundational knowledge. Third, targeted support for urban students is necessary since the ruralurban awareness gap suggests need for specialized programmes helping urban students develop connections with natural environments.

Study Limitations

This study's correlational design limits causal inferences. Future longitudinal research could better establish directional relationships between demographic factors and knowledge development. Additionally, the sample's focus on environmental and health management students may limit generalizability to other academic disciplines. Future studies should examine correlations between green space knowledge and actual conservation behaviors, as well as investigate how cultural factors might moderate the observed demographic relationships.

CONCLUSION

This correlation analysis reveals significant relationships between demographic characteristics and green space knowledge among university students. The strongest correlations were found between home green space access and campus engagement (r=0.445), academic level and knowledge complexity (r=0.312), and rural background with conservation awareness (r=0.298). These findings demonstrate that prior experience with natural environments, educational advancement, and geographic background substantially influences environmental consciousness. The results have important implications for environmental education design in higher education institutions. Programmes should acknowledge students' diverse backgrounds and provide differentiated learning experiences that build upon existing knowledge while addressing gaps. The strong correlation between formal education and conservation participation underscores the potential for universities to cultivate environmental stewardship through strategic curriculum integration.

Universities in developing countries, particularly in sub-Saharan Africa, can use these insights to develop more effective environmental education programmes that account for students' varied backgrounds while building comprehensive environmental literacy. The correlation patterns observed at Mzumbe University likely reflect broader regional trends, making these findings relevant for educational policy development across similar institutional contexts. Future environmental education initiatives should leverage the positive correlations between experiential learning and engagement while addressing demographic disparities in environmental awareness. By understanding these relationships, educators can design more effective interventions that transform environmental knowledge into sustained conservation action.

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