Significance of Landscape on Students' Learning Performance: A Case Study of Modibbo Adama University, Yola and American University of Nigeria, Yola Adamawa State

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Abstract: An environment that is landscaped creates a conducive atmosphere that plays a role in assisting in the learning process of students directly or indirectly through calming of the mind and increased concentration. The ambient temperature outside the classroom stimulates the mind and encourages the learning process. This research seeks to assessing the significance of landscape on students' learning performance. For the purpose of this research, primary data were collected through questionnaires and observation of the case study. Meanwhile, secondary data were collected through journals, internet search and publications. Two schools were selected to compare students in a landscape and non-landscaped institutional environment. 60 questionnaires were administered to students in both institution, 30 per institution. Data collected were analyzed using the descriptive statistic method (mean and standard deviation) and a decision rule was adopted to analyze the calculated mean of each table. Results from findings showed that there is an important relationship between the functions of landscape assisting in the learning process and the academic achievement of students. This establishes that landscape has a significant role in the learning process and should be given adequate attention to create knowingness amongst institutional environment.

I. INTRODUCTION

Most educational institution have been observed to underrate landscapes significance on students learning. Landscape aesthetic and thermal comfort have always been explored leaving its ability to restore attention, relieve stress, ease mental fatigue thereby improving students learning performance. Al-Ruheli et al, (2008). attests to the fact that humans are aesthetically attracted to natural contents and to particular landscape configuration whose features are also found to have positive effect on human functioning and can reduce stress. As opined by Riggin, (2011). in addition to the aesthetics reasons, there are beneficial purposes that goes beyond mere architectural decoration. Furthermore, apart from enhancing and complementing a space, it provides benefits such as health, economic and overall sense of well-being.

Landscaping combines elements of science and art to create a functional, aesthetically pleasing extension of indoor living to the outdoors Ingram, (1991). Furthermore, he appraises that the initial purpose of landscape design plan is to blend man's technology (house or building) into the natural surroundings. Landscape relates to the process of creating a fascinating outdoor space thereby improving the quality of an environment as well as harmony between man and his environment.

Sullivan and Li, (2016). stated that "context impacts learning"-which implies that students with a view of trees through a class window were able to recover their ability to pay attention and bounce back from stress more rapidly than those who looked out on a parking lot or had no windows. Nature does this in two ways, first attention restoration through its ability to engender "soft fascination" that doesn't demand all of our attention thereby renew our cognitive capacity to pay attention, and stress reduction looks at how nature supports psychological and physiological recovery, including lower blood pressure and levels of stress hormones.

Daniel and Dcosgiove, (1988). described landscape not in physical terms but as an outward expression of human perception. Landscape is not given emphasis by most individuals because they lack the perpetual knowledge of the significance of landscape in a school environment. However, there is a need to know them by improving the quality of the learning environment through landscaping in order to increase the learning performance of students, reducing stress, mental fatigue and attention restoration.

Hassan, (2014). postulates that landscape elements of nature interact to create a nonrandom organization in patterns and aggregate. Few of its purpose includes- it serves as a demarcation for site boundaries, signal to different areas within a site, understanding a site circulation pattern and scale and contributes to visitor's orientation. The incorporation of landscape elements not only adds to aesthetics but aids increase achievement and confidence, improve behavior and health while developing extensive range of skills and ultimately improving academic performance amongst students.

The importance of landscape in learning cannot be overemphasized, despite that little landscape is done in Modibbo Adama university, Yola. This study intends to evaluate the impact of landscape on students learning since providing quality, integrated green space in school areas is proven to enhance the quality of life, staff and student's learning performance, reducing stress and tension, increasing concentration as well as combating climate change and rising temperatures known in Yola. Moreover, studies indicate that stress, concentration and temperature are factors influencing human efficiency and learning. The aim of this research is to assess the significance of landscape on students learning performance in Moddibo Adama University, Yola and American University of Nigeria, Yola and to know its impact on students' academic performance and wellbeing.

This paper is a conceptual one, geared towards examining landscape and its various elements as it relates to students learning in Moddibo Adama University, Yola and American University Nigeria, Yola and also to examine students in a landscaped, non-landscaped institutional environment and analyze the level to which landscape influences learning thereby create awareness, recommend and encourage landscape in institutional environment so as to enhance learning.

How does landscape and its various elements enhance students learning in Moddibo Adama University, Yola and American University of Nigeria, Yola. If there is a causal relationship, we also do not know the perception of students who learn in a landscaped environment and those who learn in a non-landscaped environment? Finally, what principles of landscape design and elements of art are best recommended for educational institutions to enhance learning? This paper and study reported here is designed to address these questions. The findings of this research will impact to the benefit of the society considering that the landscape plays an important role in students learning. Thus, schools that apply the recommended approach will be able to train students better in a well landscaped environment as landscape plays an important role in reducing stress and tension and increasing concentration.

II. THEORETICAL FRAMEWORK ON LANDSCAPE AND STUDENTS LEARNING

A. THE CONCEPT OF LANDSCAPE AND LANDSCAPE PLAN

Thwaite, (1974). sees landscape as a generic term covering the totality of views, weather of country or a tow, in a given area. Falade, (1985). described that the term "landscape" as both firm and elusive meaning. He defined it as a cultural concept, a sensory response perceived, learned and recalled by individual as he places himself in his environment. It is a response overlaid by time, not within the lifetime of the individual but the lifetime of his culture. Landscape deals with the visual aspect of physical environment that is aesthetically pleasing. Landscaping has to do with any activity that alter the visible features of an area of land which includes living elements, natural elements and abstract elements.

Landscaping can simply be described as the art and science of modifying land areas by organizing natural, cultural, or constructed elements according to a comprehensive aesthetic plan Laurie, (1978). These elements include topographical features such as hills, valleys, rivers and ponds; plants such as trees, shrubs, flowers, grasses; constructions such as buildings, roads, bridges, fountains, pavements, terraces etc. Creating and preserving aesthetics in the environment, as well as promoting comfort, convenience and health, are the most important function of landscaping. Ireys, (1978). posited that landscaping is man's effort aimed at upgrading the quality of the environment to achieve some degree of naturalness and relation with the environment, allowing for harmony in the human mind and body.

Deen, (2004). describes a landscape plan as a diagram, sketch or outline showing a pattern if arrangement of man-made and ecological elements in an area after a survey, analysis and planning. Landscape plan is an instrument used in the creation of a pleasing environment public goods. Accordingly, planning for landscape should be guided by the knowledge of the past, understanding of the present situation and fully forecasting the future requirement for environmental and public goods. Hence, a landscape plan expresses priorities, which reflect a concern, for among other things energy efficiency and bio-diversity. Landscape plan can be seen as a design that seems to make changes to our environment via natural and man-made elements to achieve a comfortable and well pleasing environment. Laurie (1978). defined landscape planning as an art whose most important function is to create and preserve beauty in the surroundings thereby promoting comfort convenience and health of population, which have scanty access to natural scenery. Landscape planning is the art and science of emplacement and unifying together of various land uses in the process which is based on a technical knowledge of the physical geography of landscape and an aesthetic understanding of its appearance. Landscape planning is the process of changing or modifying land areas which involves careful selection of various elements such as plants, lakes, building, ponds etc. in an aesthetically pleasing form. It involves the qualitative and functional arrangement and spacing of plants and non-plants garden features on a parcel of

land set aside in the planning process that gives an overall pleasing effect.

Landscape planning therefore, set out a framework and lines of action by which the landscape is to add in accordance to ecological principles, so as to meet the needs of changing circumstances.

B. CLASSIFICATION OF LANDSCAPE ELEMENTS

Landscapes ae composed of elements of different nature which interacts to create a nonrandom organization in aggregates and pattern. Furthermore, landscape elements have important functions of serving as signal to different areas within a site, contributes to visitor orientation and understanding of the site's circulation patterns and scale Beierkuhnlein, (2002). Landscape elements falls into two categories of hard and soft materials and water bodies according to Adadeji and Fadamiro, (2011).

The elements fall into categories of hard and soft materials. The hard landscape elements also referred to as inorganic Raff, (2006); Archidude, (2012); which are structural in nature as kerbs, stones, bollard, tiles and wall sculptures. While the soft landscape elements known as organic elements Blake, (1999); Archidude, (2012) include animate elements such as plants i.e. trees, shrubs, flowers, grasses and water bodies i.e. pools, pond and fountain. Incorporating landscape elements does not only add to aesthetics but it also improves man's visual attraction and comfort within the built environment making it beautiful and functional.

Landscape elements could be generally classified into two:
- ✓ Soft landscape (organic element)
- ✓ Hard landscape (inorganic element

C. LANDSCAPE COGNITIVE BENEFIT TO STUDENT LEARNING IN TERTIARY INSTITUTIONS

The aim of landscape in tertiary institution is to create a pleasant and functional environment for learning. The Obafemi Awolowo University which is known as university of Ile-Ife is among the Nigerian universities that has benefited from landscaping of its environment, others include Ahmadu Bello University Zaria and Gombe State University. Other foreign universities include the Harvey University in Cambridge, which was named in the Princeton Review's 2011 Green Honor Roll for its commitment to environmentally friendly principles, others include the University of California which was named UC Berkeley the 22nd best national University in 2011, and the school was also listed in the 2011 Princeton Review Green Honor Roll. The roles of landscaping in Nigerian Universities include:

a. PROVIDES SCENE FOR VARIETY OF CAMPUS ACTIVITIES

Activities on campuses vary from studying, relaxing, to formal/informal events (university wide, group, class, sports, commencement, etc.), including people watching, enjoying nature, meditation, chatting with friends, picnic, games, playing Frisbee, and so on. The landscape "encourage the maximum number of impromptu encounters with other students, with other faculty members, with visitors, with works of art, with books, and with activities with which one is not himself a regular part will stimulate curiosity, prompt casual encounter and conversation the atmosphere which it produces be truly educational in the broadest sense" Keast, (1967). Landscapes are essential to reduce stress among students and making the intensity or boredom of classes more tolerable.

b. LANDSCAPE SERVES AS A SHADE

Planting trees along walkways and parking areas can be used as a shade at regular intervals. A wide spreading tree may be chosen to provide shade. Tall trees give the impression of height, which would be more suitable for this purpose. The pattern and line arrangement are equally important as they could be termed as a soothing of the arrangement against the background. Having trees arrayed on walkway paths reduces the effect of climatic factor on individuals.

c. LANDSCAPING SCHOOL ENVIRONMENT CREATES A SENSE OF DISTINCTIVENESS

Having a great landscape around a campus environment, tends to make the institution different from other institution. There would be no great campuses without good landscape. These spaces are shared by students, staff, and faculty as they move around campus, socializes, recreate, and study. These spaces connect buildings and establish the image of the institution. It is the treatment of this campus landscape that forms the opinions, impressions, and attitudes of the institution. The visual quality of the campus has a profound influence on the quality of people's experiences on campuses. It puts colleges and universities in a better position to attract and retain faculty and students, advance educational and research programs, energize fund-raising appeals to alumni and friends, demonstrate environmental design concepts and ethics, enlarge the presence of art, and strengthen the campus as a community design asset.

III. METHODOLOGY

A. RESEARCH DESIGN

The research design adopted for this study is the descriptive research design. Descriptive research includes surveys and fact-finding enquiries of different kinds Kothari, (2004). The major purpose of descriptive research is description of the state of affairs as it exists at present. Individuals quite often use the term Ex-post facto research for descriptive research. This study seeks to measure, compare and analyze data gotten from the variables of this research since descriptive research tends to assess between different variables to get results.

B. SAMPLING TECHNIQUES AND RESPONDENTS

The Population of the study in this research consists of students in Modibbo Adama University, Yola and the American University of Nigeria, Yola. This population was chosen based on the availability of landscape in the American University of Nigeria and the inadequacy of landscape in Modibbo Adama University, Yola.

A researcher must decide the way of selecting a sample or what is popularly known as the sample design. In other words, a sample design is a definite plan determined before any data are actually collected for obtaining a sample from a given population Kothari, (2004). The sampling technique employed for this study is judgmental or purposive sampling technique. The primary consideration in purposive sampling is your judgment as to who can provide the best information to achieve the objectives of your study. This sampling technique was implored because of the availability of landscape in American University of Nigeria and inadequacy of landscape in Modibbo Adama University, Yola. Sample size was gotten based on the formula that ascertains 95% confidence level and 5% margin error. 60 students would be administered questionnaires in both institutions. 30 per institution.

C. DATA COLLECTION AND ANALYSIS TECHNIQUE

There are two major approaches to gathering information about a situation, person, problem or phenomenon Kumar, (2011). When a research study is undertaken, in most situations, you need to collect the required information. The collection of data in this study will be based on two ways which are primary and secondary data.

For the purpose of this research, primary data will be collected through information generated from questionnaires and through observation of the case study.

Secondary data are data's gotten from several means that include journals, internet search and publications within which information's were acquired and complied.

The data that will be collected for this research will be analyzed based on descriptive statistics which is established on the detailed description using the following; Total, mean, median, percentage, mode, standard deviation and frequency. The results will be in tabular form   according to the number of respondents in each question. A percipient analysis of each table will be given percentages and value of frequencies proceeded by interpretation of results.

$$\text{Mean } (\boldsymbol{x}) = \frac{\sum f\, x}{f}$$

SA = 5 points, A = 4 points, N = 3 points, D = 2 points, SD = 1 point

Therefore $\boldsymbol{x}$ = 5+4+3+2+1 = 15

$$\text{Standard Deviation (SD)} = \frac{\sqrt{\sum f\,(x - x)2}}{\sum f}$$

Where ($\boldsymbol{x}$) = mean
$\sum$ = Summation
$\boldsymbol{f}$ = frequency (total scores in distribution)
$\boldsymbol{x}$ = Score in distribution

D. RESEARCH INSTRUMENT

Structured questionnaires were prepared and administered to the respondents from the sampled population. The questionnaire comprised of points relating to the significance of soft landscape. The respondents were expected to choose one from the options provided which was drawn from the Likert ordinal scale, ranging from strongly agreed to strongly disagree.

SA Strongly Agree	(5)
A Agree	(4)
N Not sure	(3)
D Disagree	(2)
SD Strongly Disagree	(1)

Data collected were examined using average mean and standard deviation. The options provided for the questionnaire were judged.

The desired rule for the research was carried out by using mean level point of 3.0 and anything less than that was regarded disagreed. The mean level was gotten from,

$$\frac{\sum (5;4;3;2;1)}{N} = 3.0$$

Where N is the number of Linkert ordinal scale used.

IV. RESULTS AND DISCUSSION

This chapter presents the hypothesis, results, analysis, observations and findings of data collected. Hypothesis which is a conjectural statement between the relationship of two or more variables. Analysis examines the response and feelings of respondents towards landscape element. Both case studies were compared to assess the differences between students in a landscaped and non-landscaped environment.

The perception of students who learn in a landscaped environment and those who learn in a non-landscaped environment from both institutions.

Responses	MAU			AUN		
	Frequency	$f\,x$	%	Frequency	$f\,x$	%
Very Good	0	0	0	17	85	57
Good	5	20	17	10	40	33
Not Sure	2	6	7	3	9	10
Fair	15	30	50	0	0	0
Bad	8	8	26	0	0	0
Total	30	64	100	30	134	100

Source: field study, 2021
Table 1: Rate the landscape of your school

Table 1. shows the responses of respondents rating the landscape of their school. The mean of the MAU students is 2.13 and a standard deviation of 0.99. According to the adopted decision rule the mean response of 2.13 rates the landscape of Modibbo Adama University, Yola poor.

The percentage of the frequency response that the landscape of American University of Nigeria is good. The mean is 4.46 with a standard deviation of 0.66. By the decision rule adopted the landscape is rated good.

Responses	MAU			AUN		
	Frequency	f x	%	Frequency	f x	%
Strongly Agree	2	10	6	8	40	27
Agree	5	20	17	11	44	37
Not sure	15	45	50	3	9	10
Disagree	5	10	17	5	10	16
Strongly Disagree	3	3	10	3	3	10
Total	30	88	100	30	106	100

Source: field study, 2021

Table 2: Having trees around a building tends to reduce the effects of sun and creates a conductive environment

Based on the data obtained from Table 2, for MAU 23% of the respondents agreed, 50% were not sure while, 27% disagreed. The mean resulted to 2.9 with a standard deviation of 0.99. The resulted mean 2.9 indicates that the respondents disagree that having trees around a building tends to reduce the effects of sun and create a conducive environment. This is as a result of limited tree around the school compound. For AUN records that 64% agrees, 10% not sure and 26% disagrees to the above research question. This table recorded a mean of 3.53 and a standard deviation of 1.30. Going by the decision rule it can be ascertained that the respondents agreed to the research question as a result of them enjoying the positive effect of the trees.

Responses	MAU			AUN		
	Frequency	f x	%	Frequency	f x	%
Strongly Agree	8	40	27	7	35	23
Agree	15	60	50	13	52	43
Not sure	4	12	13	6	18	20
Disagree	2	4	7	4	8	14
Strongly Disagree	1	1	3	0	0	0
Total	30	117	100	30	113	100

Source: field study, 2021

Table 3: Areas in school with trees, shrubs and grasses tends to have students reading within the vicinity

About 77% of the respondents in Table 4 for MAU agreed to the above research question, 13% not sure and 10% disagreed. The statistical mean is 3.9 with a standard deviation of 1.10. Going by the decision rule, respondents agree to the research question. For AUN, 66% agreed, 20% responded not sure and 14% disagreed. The mean is 3.76 and the standard deviation is 0.95. Going by the mean and decision rule, the respondents agrees that Areas in school with trees, shrubs and grasses tends to have students reading within the vicinity.

Responses	MAU			AUN		
	Frequency	f x	%	Frequency	f x	%
Strongly Agree	2	10	23	6	30	20
Agree	9	36	43	11	44	37
Not sure	9	27	20	6	18	20
Disagree	7	14	14	4	8	13
Strongly Disagree	3	3	0	0	0	10
Total	30	90	100	30	103	100

Source: field study, 2021

Table 4: Trees, flowers and shrubs creates a comfortable environment that helps in improving ones' concentration

For MAU 11% of the respondents agreed, 9% not sure and 10% disagreed to the research question that Trees, flowers and shrubs creates a comfortable environment that helps in improving ones' concentration. The statistical mean is 2.9 with a standard deviation of 0.99.

The mean of the respondents' rates the research question disagreed. 57% of the respondent in AUN agreed to the research question, 20% not sure and 23% disagreed. The calculated mean is 3.43 and a standard deviation of 1.22. Going by the adopted decision rule the research question is rated agreed.

Responses	MAU			AUN		
	Frequency	f x	%	Frequency	f x	%
Strongly Agree	9	45	30	10	50	33
Agree	11	44	37	12	48	40
Not sure	6	18	20	4	12	14
Disagree	4	8	13	3	6	10
Strongly Disagree	0	0	0	1	1	3
Total	30	90	100	30	117	100

Source: field study, 2021

Table 5: Looking at the surrounding with variety of flowers, shrubs, grasses and trees makes one feel relaxed and relieved

For MAU, 67% agreed, 20% responded not sure and 13% disagreed. The mean is 3.83 and the standard deviation is 1. Going by the mean and decision rule, the respondents agree that looking at a surrounding with variety of flowers, shrubs, grasses and trees makes one feel relaxed and relieved. For AUN, 73% agreed, 14% responded not sure and 13% disagreed. The mean of the above table is 3.9 and the standard deviation is 1.10. The resulted mean depicts that the respondents agree that looking at a surrounding with variety of flowers, shrubs, grasses and trees makes one feel relaxed and relieved.

Responses	MAU			AUN		
	Frequency	f x	%	Frequency	f x	%
Strongly Agree	5	25	17	10	50	33
Agree	10	40	33	9	36	30
Not sure	7	21	23	6	18	20
Disagree	5	10	17	3	6	10
Strongly Disagree	3	3	10	2	2	7
Total	30	99	100	30	112	100

Source: field study, 2021

Table 6: Availability of trees, flowers, grasses and shrubs in an institutional environment enhances students learning

Based on the data generated, 50% of the respondents in MAU agreed, 23% were not sure while, 27% disagreed. The mean resulted to 3.3 with a standard deviation of 1.21. The resulted mean of 3.3 shows that the respondents agreed going by the decision rule. Analysis for AUN depicts that 63% of the respondent agreed, 20% responded not sure while 17% disagreed. The mean resulted to 3.7 with a standard deviation

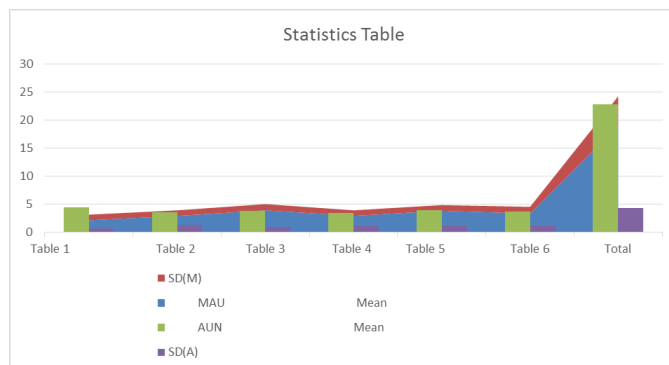of 1.20. The resulted mean of 3.7 indicates that the respondents agreed to question on table 6.

A. DISCURSION OF FINDINGS

a. OBSERVATION OF CASE STUDY 1: MODIBBO ADAMA UNIVERSITY, YOLA

Students in Modibbo Adama University, Yola appear to be stressed due to insufficiency of landscape within the school. The non-availability of landscape and walkways within the school environs tends to make students look tensed. As mentioned earlier, a conducive environment has an important role to play in the learning process of students, this is something that the institution lacks. Landscape is not encouraged in the school environment, even the little that is available is not properly taken care of. Students appear to be tired on reaching their lecture hall before lectures begins. Imagine a scenario where one is already stressed out due to heat or any other activity, it would be difficult for such a student to concentrate and get the best when lectures is delivered.

b. OBSERVATION OF CASE STUDY 2: AMERICAN UNIVERSITY OF NIGERIA, YOLA

American University of Nigeria, Yola is an institution that has considered landscape an integral part of the school. Even from pictures seen in the plates, it shows how landscape is given due consideration. Student in this institution have privileges of being in environment that is well taken care of. From observation, they tend to appear emotionally healthy. Their walkways are covered thereby reducing heat that causes tension. There is landscape view from their libraries, lecture halls and hostels. They seem happy as they chat and walk around the campus.

Plate 1: Showing around a Building in AUN
Source: field study, July (2021)

Plate 2: Showing around a Building in AUN
Source: field study, July (2021)

Plate 16: MAU Pre-degree Centre
Source: field study, July (2021)

Plate 16: MAU Learning centers
Source: field study, July (2021)

Note: Higher Mean Value Results in Better Examination Results
Figure 1: Graphical representation of total mean values

V. SUMMARY, CONCLUSION AND RECOMMENDATIONS

A. RESTATEMENT OF PROBLEM

The importance of landscape in learning cannot be overemphasized, despite that little landscape is done in Modibbo Adama university, Yola. This study intends to evaluate the impact of landscape on students learning since providing quality, integrated green space in school areas is proven to enhance the quality of life, staff and student's academic performance, reducing stress and tension, increasing concentration as well as combating climate change and rising temperatures known in Yola. Moreover, studies indicate that stress, concentration and temperature are factors influencing human efficiency and learning.

B. SUMMARY OF METHOD AND FINDINGS

The paramount purpose of this research was to access the significance of landscape on students learning performance. To achieve that goal, it became essential to reach some requirement goal. The aim of this research was to identify the various landscape element and to compare students in a landscaped and non-landscaped institutional environment and examine the level to which landscape influences learning. Determining what landscape is and how it aids in the learning process of students acquired a degree of importance during the literature review conducted for this research project. This research took on the descriptive research design method. Data was collected through questionnaire and observation of the case study. The questionnaire adopted the Likert ordinal scale, proceeding ranked into strongly agree, agree, not sure, disagree and strongly disagree. The study was conducted in Yola with 60 respondents sampled. 30 each in Modibbo Adama University, Yola and American University of Nigeria, Yola. The research data gathered was analyzed through the use of descriptive statistic method (mean and standard deviation) and a decision rule was adopted to analyze the calculated mean lf each table. Results from the findings of this research shows that soft landscape plays a significant role in the learning process of students.

C. CONCLUSION FROM FINDINGS

According to the view of the respondents and findings of this research, soft landscape is seen as an important aspect in an institutional environment as it aids in the learning process. There is a need for landscape to be encouraged in institutions because it has positive effect on students psychologically. Based on results gotten from this research, students tend to sit around green areas to study. This shows that a conductive environment improves ones' concentration and reduce stress and tension.

D. RECOMMENDATIONS FROM FINDINGS

Based on the assessment that was carried out and the problems that were identified in the study area, recommendations made regarding the impact of landscape are as follows;

✓ Landscape should be encouraged in institutional environment as it provides an opportunity for the school's management to beautify their school environment to enhance the learning environment.
✓ Landscape elements such as trees, shrubs, grasses and flowers should be given adequate maintenance through watering, pruning, weeding and application of fertilizers so as to sustain plant life, promote growth and provide a conducive environment.
✓ Planting of trees should be promoted in order to provide shade, to reduce the amount of sunlight on a building and serve as a control for noise.
✓ Gardens should be introduced in school areas which can be used for academic enrichment, connects students to nature and also make them emotionally healthy.

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