

The landscape elements of university buildings in Saudi Arabia, and its impact to provide a suitable environment for its users (AL-Yamamah university ,in AL-Riyadh:) case study

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Abstract

The external spaces in the university buildings, which constitute the university campus, can consider as the lung and the basic breathing for the students and users of these buildings, because they include a huge amount of activities and movement.

The importance of the exterior spaces in university buildings appears in its positive effects on the users of university buildings in view of its multiple functions that achieve the public benefit. Elements which are used in site landscape can be One of the most important additions of these spaces and one of the most important elements that give the university's campus sort of suspense and wealth.

The aim of this paper is: to study the effect of the landscape furniture and elements which can be used in the external spaces of the university buildings on the users of these buildings, and the role of these elements, which can be (Axis - Topography of the site and its environmental determinants) in raising the efficiency of the functional performance of the services in the university buildings.

The methodology of this study was mainly based on the descriptive and analytical method approach which is based on the collection of information from previous studies, available about the subject (university buildings in Saudi Arabia), then in particular case (AL-Yamamah University) as an example.

Tools that were used in this research: visits and interviews with experts, and survey about the opinion of the university users, on functional and aesthetics requirements of landscape elements in the exterior spaces in their universities and how much they match their needs, and then measuring the satisfaction of users on the existing landscape elements to know their impressions about those elements and their impact

on their scientific performance and their psychological structure.

This paper will be presented in three parts:
- **Part 1:** It deals with theoretical studies to determine the important of the landscape elements of the site .

- **Part 2:** it deals with applied the landscape elements in the university buildings, and then selecting an applied model to review the views of the users (Al- Yamamah University in Riyadh).

- **Part 3:** It will focus on the results that determine the landscape elements of the in the desert environments, and identify the most important elements so as to upgrade the external spaces of the buildings of universities, to become more efficient and compatible with the environmental and climatic determinants, and have a positive impact on its users.

Keywords:(Landscape elements - environmental aspects- exterior spaces- university building).

INTRODUCTION

The landscape, is a system with all its elements, processes, and materials, which can effectively contribute to the enhancement of the functionality of any associated building.

The most important Role of landscape is to survival of existing buildings and sites, and protect them, as an environmental object analyzed in relation with visual border character and the needs of the buildings and sites users. The aim of this paper is to identify whether and how landscape elements and landscape design can affect positively on the users of the buildings which is related to.

In this research attention was directed to the description and analyses of the visual landscape around universities buildings, during their use, to confirm the impact of these zones, to raise the performance of users of the university buildings and meet their psychological needs.

I. Part 1: Theoretical Methodology

1. Definition of (Landscape)

1.1. The multiple meanings of landscape:

The origin of the word 'landscape' comes from the Germanic languages. One of the oldest references in the Dutch language dates from the early thirteenth century when ("lantscap","landschap") referred to a land region or environment.

It is related to the word 'land', meaning a bordered territory, but its suffix -scape refers to land reclamation and creation, as is also found in the German 'Landschaft'- 'schaffen', when 'land' refers to soil and territory, 'landscape' as 'organized land' is also characteristic of the people who made it, Landscape expresses the (visual) manifestation of the territorial identity¹

1.2. Comprehensive definition of landscape:

Is the science and art, which is concerned with the planning and management of sites through the arrangement of natural elements and artificial elements while preserving the natural resources and characteristics to achieve the humanitarian need².

2. Landscape elements:

The general mission of urban design is to improve the quality of human life, landscape in public spaces is one branch of urban design which can be an instrument to create dynamics at the site and to ensure community interaction.

The impact of landscape design and its elements which emerging in exterior spaces can be characterized by urban regeneration, public space revival, enchanting or attracting people, creation of the sense of a place and contributing to the express the cultural value of the place, and any other added value to it.

2.1. Requirements of landscape elements:

The elements of landscape in any space should have many requirements, which can be:

- i. Physically aesthetic requirements, which include the improvement of aesthetic quality.
- ii. Economic requirements, which include the improvement of economic activities.
- iii. Social requirements, which include the facilitation of the community and social interactions.
- iv. Cultural and symbolic requirements, which include the creation of a symbolic value.

Thus, landscape design in any space gives rise to a diverse range of effects in socio political, economic, and cultural fields, by its elements which can be attractive for a variety of users.

¹ : **Brief history of landscape research**, Marc Antrop, UNIVERSITY OF GHENT

² : **ROLES AND MEANINGS OF 'LANDSCAPE'**, A thesis submitted in fulfilment of the requirements for the degree of Doctor of Philosophy in Resource Studies, Simon R. Swaffield, LINCOLN UNIVERSITY

2.2. Types of landscape elements:

External landscape elements form an integral part of the built environment design in enhancing both the performance and aesthetic values of buildings, every kind of landscape have some common elements which can be, both the natural elements or manmade elements.

A. Natural elements in landscape designing contains air, water, soil, natural vegetation, which may consist of lawn areas, hedges, vines, roses, borders, decorative pots, which can be planted with annual or perennial flower plants, trees and shrubs.

B. there are not only natural influences that affect the landscape; there is also a man who is changing the nature and landscape structure with its interventions - landscape components overlap the landscape elements. Thus, the landscape elements occur under the influence human and natural factors on landscape components and together they form the so-called mosaic landscape.

A **manmade** landscape is made up of natural elements and artificial elements, which can be designed in different ways of fitting and decorative and utility facilities the construction decorative or functional.

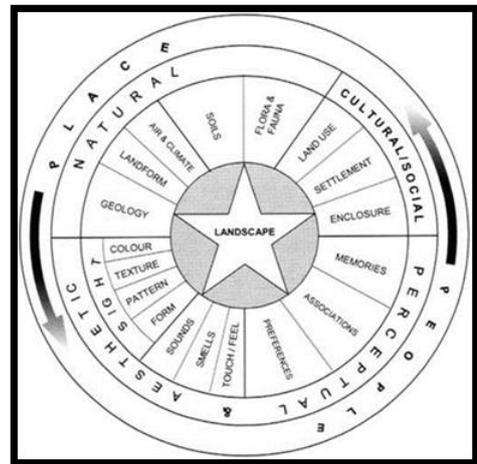


Figure 1: Landscape components³

2.3. Landscape characteristics:

A landscape is characterized by Three main features which can be:

A. a structure (composition): The landscape structure is determined by the spatial relationship between characteristic of represented ecosystems or components, Landscape structure has a major impact on the functional properties of the landscape. The change in structure is reflected in the transformation of energy flows and affects the permeability of the landscape and the buildings Surrounding it.

B. a function: functional objects as those landscape elements that are designed for usage or perceived to be used by a certain social group.

³ :https://is.mendelu.cz/eknihovna/opory/zobraz_cast.pl?cast=5906

C. changes (dynamics): It should be noted that the landscape is not static; it changes over time and with varying intensity.

3. The purpose of landscape

The landscape elements and component should be designed to achieve the following specific objectives:

- Provide ample landscaping, using low maintenance, low water use native plantings that evoke the surrounding landscapes.
- Maintain the visual character of the open grasslands and agricultural landscape in the rural areas.
- Provide rest areas, landmarks, and consistent signage at key locations to help unify the Parkway.
- Provide noise mitigation and wide landscape buffers to mitigate impacts to established and planned residential areas.
- Provide for strategic acquisition of open space lands
- greenbelt area to serve as a community separator.

The role of landscape architects lies in maintaining a balance between improving our natural, urban and social environments so as to achieve the best social and healthy life for those how use these buildings.

And it is possible to divide the role of landscape architects in line with four environments, namely natural environment, built environment, social environment, cultural and historical environment⁴.

4. Campus landscape in university buildings:

“The enjoyment of scenery employs the mind without fatigue, and yet exercises it, tranquilizes it and yet enlivens it and thus, through the influence of the mind over the body gives the effect of refreshing rest and reinvigoration to the whole system.”

The quality of the campus plays a key role in achieving this goal, it is critical that the University takes steps to shape a campus that supports its student community, that creates a cohesive and attractive setting for the University, and that attracts prospective students. The role that campus beauty plays in attracting students and in contributing to their happiness as a student is well documented.

The campuses are wonderful places for people, maximizing pedestrian connections and spaces.

But in addition to these elements, the beautiful campuses also have a distinctive character, be it architectural or landscape, that sets the campus apart, that makes it unique and memorable, that gives it a strong sense of place, and gives its community a sense of pride.

foremost a learning environment – a campus that supports its community with spaces conducive to learning, and also serves as an outdoor laboratory for horticulture and natural resource stewardship. The landscape vision is also a move to a campus that is pedestrian centered rather automobile

⁴ : **LANDSCAPE ARCHITECTURE AND THE SAUDI ARABIA QUALITY OF LIFE PROGRAM**, Abdullah N. Addas, Department of Landscape Architecture - Faculty of Environmental Design – King Abdulaziz University – Saudi Arabia

focused and that further supports learning by promoting interactions and healthy movement within the campus.

The vision for the campus landscape includes a move toward a stronger contribution to a healthier ecosystem.

5. TYPICAL CAMPUS SPACES:

The following list of typical campus spaces comprise the open-space network⁵

1. Edges and Boundaries
2. Gateways and Entrances
3. Plazas
4. Quadrangles
5. Pedestrian Malls
6. Great Lawns
7. Streetscapes
8. Surface Parking
9. Spaces Between and Behind Buildings
10. Environmentally-Sensitive Area

And a consistent campus aesthetic will be achieved in landscape design by:

(Site Paving - Site Furnishings- Site Lighting- Site Signage- Plantings and Soils Service Areas and Utilities.)

6. Principles of the campus landscape⁶

6.1. Principle One:

Building Siting.

Reinforce the University’s identity and the unique setting of the campus by using its topography, and its structures and setting to create connections and spaces outside the building – with thoughtfully sited building campus must be sited to reinforce the campus character and engage the campus to be more positive as those within it.

this can be achieved by:

- Site buildings to use topography and other resources.
- Site buildings to shape successful campus spaces.
- Site buildings to strengthen campus connection.

6.2. Principle Two:

Campus Spaces

Enrich the University with a comprehensive network of campus spaces that reflect the University’s mission to embody excellence in learning, this can be Approached by:

- design of campus spaces in a comprehensive manner prime consideration must be the space’s contribution to the entire campus open space system and the embodiment of excellence, not the enhancement of a particular building.
- Create a campus network of spaces.
- Enhance the campus as a place for learning.
- Create successful campus spaces.

⁵ : **CAMPUS LANDSCAPE VISION AND SITE STANDARDS** - CAROL R JOHNSON ASSOCIATES INC- December 2012

⁶ : **CAMPUS LANDSCAPE VISION AND SITE STANDARDS** - CAROL R JOHNSON ASSOCIATES INC- December 2012

6.3. Principle Three:

Campus Connections.

Optimize campus pedestrian connections above all others. Campus landscapes are, above all, places for people; in order for the campus to be perceived as a cohesive, welcoming, and attractive space, by its pedestrian connections must be positive ones, vehicular connections must be downplayed, and alternative transportation promoted, so this can be approached by:

- Reinforce campus pedestrian connections
- Minimize the impact of vehicles on campus - design streetscapes and vehicular zones for pedestrian comfort.
- Enhance alternative transportation on campus

6.4. Principle Four:

Campus Plantings

Enhance all campus spaces and connections with healthy, well-sited, and well-maintained plantings and turf. Campus plantings play a critical supporting role in shaping successful campus spaces and connections; the health, performance, and maintenance level of those plantings and lawns are essential to providing the campus with a high-quality image

- Create a cohesive and coherent landscape that reflects the heritage and setting of the campus.
- Shape campus spaces with plantings.
- Create high quality and high performance landscapes.

6.5. Principle Five:

Sustainability

Augment the integrity and performance of the campus landscape by employing sustainable practices.

Authentic participation in higher education programs to advance environmental responsibility must guide all campus development.

- Implement sustainable landscape principles and practices
- Support sustainable practices for construction and maintenance
- Encourage and support sustainable practices by the community and showcase sustainable elements as they are incorporated into the campus.

II. Part 2: Applied Practical Approach

1. Challenges that affect the landscape of sites in Saudi Arabia:

- **Soil:** Most arid-zone soils are poorly developed and characterized by a high proportion of coarse sand and gravel with only limited amounts of the finer silt and clay particles. Soil salinity can also impose severe restrictions on plant growth.
- **Water:** No plant can survive in the absence of water; Saudi Arabia is an arid country with the potential for acute water shortage. The demand for water has grown substantially against a scarce and dwindling water supply
- **Wind:** Wind is a more or less constant factor in landscape and, in general, its impact may be by its damage on the trees such as defoliation or stunted growth.

• **Temperature:** All of the natural landscape elements which are trees may be damaged with the high summer temperatures found in the Kingdom, and also it can be damaged by frost, when the temperature goes below 10°C. in winter

2. University landscape design in Saudi Arabia:

landscape design in university buildings, remains critical as they analyze, plan, design and manage areas in the natural and built environments and deal with specific challenges.

The goals of landscape design for exterior spaces in university buildings depends on the extent to which an interactive and integrated physical environment for the students, that affect in positive way on their Performance in their university, can be created for the individual and society. Such an environment should be recognized as having a positive impact on the behavior and psychology of individuals through the application of innovative and effective solutions that are embodied in urban development projects based on the users' needs and desires, in turn, promote their sense of belonging and happiness and enhance the quality of life in their university, by attractive and stimulating environments can be created by participating in the development of various activities and ensuring they enhance the quality of life of the student individual and society.

3. the selected applied model (Al- Yamamah University in Riyadh).

Al-Yamamah University is located north of Riyadh, on the Al-Qassim Highway, and occupies an area of 160,000 square meters. It was designed in accordance with the latest standards for educational institutions. It contains The men's campus which consists of the central academic building, the grand auditorium, main library, students' lounge, sports club and a mosque. In addition to The women's campus with a state-of-the-art campus featuring modern facilities – both academic and recreational.

One of the most important spaces in this university is the external spaces which include the campus, it contains huge empty spaces, parking cars, simple sidewalks, a soccer field, a basketball court and a tennis ball, it also contains a volleyball court. The rest of the spaces are empty spaces where some trees are distributed in an un studied way. These spaces provide a great opportunity to remodel the site landscape, through the use of the basic principles of landscape of the campus and Taking into account the challenges of the desert environment of AL- Riyadh in general.



Photo1 the site of al- yamamah university

A questionnaire was distributed to the students to identify the needs and jobs desired by students who constitute the primary user of this campus.

Such questions were included: 'How far does the scene of the campus landscape go?' 'How often, do you visit this scene and like to go throw it?' 'How do you like the scene of the exterior spaces in the university campus look like?' 'How could you improve the scene of the campuses landscape? 'what are the other functions you suggest to add to the exterior spaces in your university?'

Based on the questionnaire results, the following results were obtained:

1. The results of interviews show that trees are the landscape elements that have the largest impact on how the students perceive the size of a space and how they like setting it.
2. There are also other elements such as benches, playgrounds, elevations that play a role in Determining the urban space of the campus.
3. open-undefined spaces are most disliked ones. Such spaces are too large, and students feel endangered there
4. Spaces that fall under spacious, well-structured category are the most liked ones.
5. such landscape elements as trees, small elevations of earth surface, benches do influence the perception and likability of space as much as the walls of the surrounding buildings do.
6. There is a wide agreement among the users that natural elements and good design for it have a positive effect on perception and performance of the students and the other users.
7. many answers indicate that more trees would play a major role in enhancing likeability of this otherwise desert like scene.
8. Some students think that more trees and benches would enhance such a yard, it would become more preferred and used.
9. the interviews show that trees as landscape elements do influence the perception of space in terms of its size by compartmentalizing a space or by adding to the feeling of enclosure.
10. The positive effect of the presence of dense groups of trees in open, undefined spaces is that they apparently add to the mystery component Yet not all trees are seen as enhancement to all kinds of spaces.

11. There is evidence that trees with high growing branches in enclosed spaces make such scenes even more disliked Functional objects as Space Shaping Elements.

12. the interviews showed that such functional objects as playgrounds and parks can demarcate perceived border very effectively.

13. The students stressed through the interviews the need for covered and shaded axis to prevent the heat of the sun in the summer.

14. Students stressed that the high asphalt areas on campus increase thermal gain in the overall site.

15. The students stressed the need for some cafeterias and service buildings in the outer spaces in addition to their proposal for the need to provide spaces for the sport of the air and other for reading and relaxing.

16. the automobile has dominated University development.

Based on the feedback and answers provided by the campus users.

A project was organized for the fourth year students of the department of architecture. Their results reflected many of the problems facing them on their campus, in addition to many of the proposed jobs.

Here are some pictures that illustrate some of the solutions proposed by students to develop their campus.



The projects focused on the external axes that link the parts of the campus with each other. Some of the ideas in terms of shading and external sessions, the division of spaces and the use of spaces in a studied manner.

The students focused on an integrated environmental study of Al Yamamah University campus, and they used the elements of landscape that fit with the desert environment, and presented the proposals for dividing the outer spaces to allocate social and recreational functions to the students using shaded and un

shaded axes, water elements and green spaces that were distributed in a harmonious manner in the site.

III. Part 3: Conclusions and results:

when we design landscape for an exterior space in a university campus, the following points should be considered:

- preserve, enhance, and continue the existing hierarchy of campus open spaces.
- Maintain the quality and interrelationships of the campus open spaces in terms of their aesthetic, historic, and cultural importance.
- Protect and preserve the building and landscape for the future.
- provide visual continuity and connectivity throughout the campus, a unified campus image, and a landscape identity.
- Enhance and establish visual continuity by controlling the use of hardscape and plant materials to promote a unified campus image and landscape identity.
- Improve connectivity throughout the campus by establishing linkages to repair broken or terminated axes and sight lines.
- preserve, restore, and enhance historic landscapes if there are any historical structures.
- Address issues of sustainability within the context of landscape and enrichment.
- Work from a palette of materials for hardscape and planting in keeping with the nature of the campus.
- The basic rule when work on a landscape design alley in a straight line, with sharp angles, because this fast moving becomes hostile. where possible, they can have flowers on the sides for added beauty and to generate that encourage chi to establish in the garden.
- Using water as a decorative item in the garden has long been an important component especially when you want to activate the chances of wealth and prosperity.
- Walls, fences and other demarcations must be at least three meters away from the entrance of the building and, in addition, take into account their composition, using specially

designed to represent the garden will be able to identify various areas then by applying the analysis elements can determine what type of energy governing a particular sector, so what material should be used to achieve the designed structure in the area.

- Sloping gardens have wonderful opportunities for creativity, land offering potential sloping so it is better than completely flat land.
- Elements such as trees, benches, elevations of earth surface, playgrounds on the perception and preference of open spaces in sit liking and perception of urban space is closely related to buildings. Namely, to the way walls of the buildings.
- Environmental psychology concept Emphasizes that walls as can be as a space shaping elements is extended towards landscape.
- We have to emphasize the impacts of external landscaping elements on indoor thermal comfort in relation to airflow rates and patterns, thereby serving as a basis for design decisions.

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