



Studying the effect of natural and artificial components in the design of external landscapes for educational institutions

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Abstract

The wheel of life is constantly evolving, and that development has included all areas of life, one of which is the field of education. We see an increasing interest in studying university external landscapes, where university buildings and their external landscapes have witnessed a great development in the process of their planning and design as a result of the development taking place in the fields of education and scientific progress. This led to an increase in the interaction between the categories of the university environment on the one hand and between these categories and the university external landscapes on the other hand by designing these spaces and achieving the aesthetic, functional, and environmental benefits and their positive repercussions on the psychological comfort for the users of those spaces where they represent the open landscapes of the campus environment, which was reflected on the level of learning for students has developed in the main, where they are the largest group among the users of university landscapes. Most of the external landscapes of our universities suffer from a lack of knowledge for the design considerations and foundations that must be provided in the design of the external landscapes of educational institutions. Therefore, there was a need to study the reality of the gardens and external landscapes for the Deanship of Agriculture College, University of Basra, and the departments of college in the new site by analyzing the site environmentally and Architecturally and providing an alternative that meets the criteria and design considerations that meet the needs of the users of the study site, thus achieve integration between the buildings University and its external landscapes. Through the study, the researcher concluded several conclusions, the most important of which is the omission of the criteria and design foundations and non-employing them in designing gardens and external landscapes for the study site. In addition to the lack of a clear vision in achieving the gardens' goals, which was due to neglect, poor planning and management, and the lack of the gardens of the external landscapes for the study site to the complementary components, which helped in this deterioration of the harsh environmental factor that defines the city of Basra, as well as the deterioration of service operations and maintenance of the components of natural and artificial gardens, although they are scarce. Accordingly, the study that was conducted, and after collecting the information from the questionnaire, the data was unloaded into a computer using the "Microsoft Office Excel" program. The results were statistically analyzed using the Statistical Package For Social Sciences (SPSS V.11) using Chi Square function. The results of the study indicated that 35% of the surveyed groups agreed on seeing trees and shrubs in the garden as natural components, and 58% of the respondents preferred that the garden should have highs and lows on its surface. 46% agreed that green areas were intermittently scattered in the garden of the site, and 50% indicated the agreement of the surveyed groups to prefer permanent trees over others, 67% agreed on the diversity of flower colors within the garden of the site, and 38% of them agreed On the necessity of the presence of the water element, especially in the form of fountains. The result of preference was about the type of attraction in the garden, 49% of the surveyed groups agreed on trees, and in the result about the type of trees preferred by garden users, the percentage was 58%. They indicated the necessity of diversifying trees such as ornamental and fruitful because of their visual impact on the garden user.

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1. Introduction

The process of studying the external landscapes and their natural and artificial components, analyzing them, and knowing the requirements they contain, is a purposeful process towards a serious approach to creating a distinctive environment concerned with enhancing the cultural role of the university in building civilized societies (Al-Asadi, 2017). The external landscapes in the universities take the picture of the natural landscape of the university urban environment, and they must be characterized by environmental characteristics that work to achieve comfort for the human being and renew his vitality, and it works to enhance social interaction between the users of these landscapes (Kamel, 2017). The external landscapes of the university campus represent a picture of the natural landscape for the entire urban environment of the university, the buildings reflect the closed part, while the gardens and external landscape represent the open landscape of the campus environment, where the human being is directly in front of the external landscape before being exposed to the internal landscape, and therefore it was necessary to These landscapes appear in an ecological and aesthetic way that aims to create comfort and safety and renew vitality and sense for a human (Raheem, 2012). The Oxford Dictionary defines a university as an institution of higher education, where students receive knowledge in order to obtain a university degree, as well as being the seat of specialized research in various fields of life (Oxford Dictionary, 2002). The university is defined as an institution of higher education that includes a group of students and faculty members, which provides facilities for education and research operations, and which awards certificates with bachelor's degrees as well as MSc and Ph.D. degrees (webesters, 2008). The university was defined by UNESCO as an institution of higher education, the field of which is open to those who have completed secondary school, and its duration is not less than three years, and it is the place where knowledge is spread and absorbed in different and advanced fields of study (Unesco, 1975). The university is considered part of the city in which it is designed, since these universities are established within cities, and accordingly, the role of university gardens must be studied in enhancing the community's resilience in the face of issues such as climate change, global warming, soil salinity...etc. Urban green landscapes and

vegetation are constantly at risk of being destroyed or removed, and new residential developments rarely plan or provide for gardens, however, the need to maintain urban green landscapes is more important than ever (Nursey-Bray et al.2014). In recent years, interest in gardens and parks has increased as a cornerstone in the task of developing urban life in a qualitative manner, through increasing attention to environmental aspects and increasing social interaction, and from this educational institutions have developed significantly in design and planning, which was in line with the development in educational aspects as well as the information revolution. where awareness has increased of the need to pay attention to the external landscapes of educational institutions, achieve psychological comfort and cultural exchange, and give man the opportunity to contemplate the nature that surrounds him with aesthetic, environmental, and architectural standards, where the design and coordination of gardens are considered one of the development goals in urban development, and it has a major role in creating an appropriate and comfortable study atmosphere for students of educational institutions (Al-Obaidi and Al-Sawaf, 2019). 2986

Theoretical aspect of the study External landscapes

The external landscapes were defined as the relationship of mass and space, or architecture art and its relationship with its neighborhoods, where the harmony of the nature of the term concept with the concept of art, which reflects the amalgamation of water, the shape of the land, Asphalt, and plants are all common and not isolated from each other, which gives an impression of drawing a painting (Dober, 2000).

Campus Landscape Architecture

It represents how to design the university's external landscapes and its multiple and interrelated layers, which is the basis for creating a green environment that visually affects its users from the university's affiliates and visitors. Through the university's external landscapes, it is possible to give perceptions, information, and ideas on how to carry out planning and design for the green environment that is located inside the university buildings. It can be imagined that the



university's external landscapes are green areas on which university buildings are distributed.

Or they are connected and extended gatherings to achieve the concept of open landscapes in the design of buildings in order to entertain the beholder and create integration between them and plants and form an architectural decoration that reflects the beauty of nature (Dober, 2000).

University Landscape Classification

• Educational Landscape :

Landscapes in which the student receives knowledge from professors within his course.

• Help Landscapes are divided into:

a. Educational auxiliary It is complementary to public educational spaces such as the library and educational workshops.

B. Public assistance Landscapes, which are Landscapes that meet the needs of other students at the university, in addition to receiving knowledge, such as the student club, the main hall, a health center, the post office, the bank, and sports halls (Al-Silafany, 1989).

• Residential Landscapes:

They are the Landscapes that meet the housing needs of teachers, staff, and students and include the related services that are used within the residential complex (Al-Alwan, 1988). They are the landscapes specialized in managing the various affairs of the university, including the university administration, deanships, registration ... etc. (Evans, 1973).

• Service landscapes:

It includes technical services such as the power station, the mail system, liquefaction of water, waste disposal, and sewage, in addition to a fire extinguishing station, a printing press, general stores, and repair garages (Al-Silafany, 1989).

Open external landscapes:

It includes all external landscapes (yards, streets, pedestrian traffic axes, car parks, and landscapes for future expansion (Unesco, 1975), and some of them are complementary to educational landscapes and public, service, or residential auxiliary landscapes where they are landscapes that serve the rest of the landscapes in the university (Evans,1973).

University institutions are spatially classified into:

The first category: is university type.

Which includes all university activities of academic, social, and residential matters, which are within the framework of one site that brings them together. The advantage of this classification is that it guarantees freedom of planning and design for its activities and events. Also, this type is not present in city centers, but rather in its outskirts and suburbs due to the difficulty of providing full spaces for it in city centers (Al-Alwan, 1988).

The second category is the integrative type.

The advantage of this classification is that it is intertwined and linked with the city in which it is located, and here, the university provides mainly academic facilities, while partially dependent on the social, housing, and service facilities provided by the city (Al-Alwan, 1988). Accordingly, the study site is located within the college complex of Karmat Ali site, which is considered within the fabric of the city of Basra. 2987

The practical side of the study

Determining the location of the study (research sample):

The new site of the College of Agriculture, University of Basra was chosen as a sample for the study, where College of Agriculture is one of the colleges of the University of Basra, which is located within the site of Karma Ali Colleges. The college was established in 1971 in the Al-Tanuma region, and after a series of events that occurred in Iraq during the Iran-Iraq war, it moved to the current site in Karmat Ali and allocated an area of 86,336 m² to the College of Agriculture in its Deanship and its departments, which is considered the new site of the college, which was designed by a civil engineering office, and the site is located In the south of the site of Karma Ali colleges, near the flank of the domes to the eastern side.

Although the architectural structures of the study sample have not yet been completed, the researcher, through his field visits to the research site and personal observation, in addition to conducting interviews. It turns out that there is a



difference between what was planned for the site (Deanship of the College) within the master plan and what exists on the ground through the external landscapes of the architectural facilities, as well as the roads and corridors. As for the rest of the architectural structures, they are still not completed, so it is not possible to give an idea of whether they differed from what was planned or not.

Environmental factors

The study site is located within the administrative boundaries of Basra city, which is known climatically with very hot conditions, an increase in the number of hours of solar brightness in the summer, and the lack of rain in the winter. The designer must choose the appropriate plant elements and place them within the design, and help reduce the negative effects of the extreme environmental conditions and work to soften the atmosphere for the study site.



The figure shows the new site of the College of Agriculture, Karma Ali site (Al-Asadi, 2017).

Architectural requirements

building style

The style of the university buildings for the study site adopted modernity in the architectural construction and was characterized by geometric shapes, and it seems that the designer wanted to highlight the engineering aspect in the style it used. Also, the facades of the deanship building and the departments were covered with alkybond material, which gave a beautiful view of the architectural building, and here comes the role of the garden designer to link the external spaces with these buildings.

The degree of closure between the university buildings under study and their external landscapes

The degree of closure between the buildings and their outer spaces can be determined through architectural plans as well as field visits and visual observations, through which the researcher concluded that the external landscape of the study site was open, where there was enough landscape to use many of the natural and artificial components in the garden (Obeid, 1981).

Degree of Containment in external landscapes (Sense of Scale)

Users of university external landscapes.

Universities are based on three main categories that use external landscapes (professors - students - employees).

Efficiency of use

The nature of the situation in the use of university external landscapes.

Universities are based on three main categories that use external landscapes (professors - students - employees). includes many activities, whether cultural or social, or their use in roaming, sitting, and resting, but when the researcher makes site visits and records his visual observation, where it was found almost non-use of the external landscapes of the study site in any of the activities, and when asking randomly a number of the included groups (professors - students - employees) about the reason for this. It has been found that the matter is due to the harsh environmental conditions that characterize Basra city most of the months of the year, as well as the failure to take into account the provision of natural and artificial components and the furnishing of these landscapes, which makes their use more appropriate in light of these environmental conditions.

Planning requirements for the study site.

The field visits made by the researcher to the study site and also the site pictures and architectural



plans of the site. It turned out that the planning requirements for the external landscapes of the study site were not taken into consideration, where the natural and artificial components were not taken into account, either in terms of their preparation or in terms of their locations within the external landscapes.

Design components of university external landscapes

The first section / Natural ingredients in external landscapes: Landscape Natural Components:

Planting Elements

It is considered one of the natural elements affecting the external landscapes, where the nature of the changes that occur in it and its different life cycles add to the external landscapes a kind of dynamism,

Plants are considered one of the main and important elements in the design and coordination of external landscapes, which works to show the landmarks appropriately if they are chosen and distributed appropriately and suit their shapes and colors in order to add aesthetics and reflect psychological comfort (Al-Qayi, 2007 and Abawi, 2008). Among the important plant elements in the design and landscaping of external landscapes are:

A- Trees

Trees are considered among the largest living organisms in the plant kingdom, the tallest, and the most woody. A tree is defined as one that is more than 3 m high and has one stem and a well-defined top.

Trees are considered an important element in the coordination and design of gardens, where they are the largest in size, which have an impact on the characteristics of the local climate, such as the effect of reducing high temperatures, increasing humidity levels, providing shade by blocking the falling sunlight, acting as windbreakers, and the significant role in the consumption of CO₂ gas. As well as its aesthetic importance in terms of its forms and its obscuration of the scenes that are intended to be hidden (Tawajen, 1987; Mahmood and Amin, 1989).

B- Shrubs

They are woody plants that are multi-stemmed (with two or more stems), ranging in height between 2-4 m. The stems bear green branches.

These shrubs are planted for the beauty of their flowers or leaves or for the regularity of their beautiful shapes and the possibility of cutting and forming them, where evergreen shrubs are used to permanently show gardens (Badr et al., 1998). Several things are taken into account when choosing shrubs in landscaping, including their suitability to the environmental conditions in the area in which the garden is to be established. Usually, it is preferable to choose from shrubs in the same area, where they are acclimatized and environmentally adaptable, which gives a clear picture of the success of their cultivation (Sheikh, 2001).

C- Hedges plants

Plant hedges are considered one of the permanent elements in the garden, and it consists of plants that are planted close together in one row and raised so that their branches overlap when they are completed, forming a vegetative or flowering frame that is used for multiple purposes.

Plant hedges are planted in the garden for many purposes, the most important of which are isolating the garden from the neighboring facilities, defining the garden, internal isolation in the garden, defining and beautifying the roads, and creating backgrounds for flowering plants (Al-Dabaa et al., 2004).

D- Climbers and Creeper

It is a group of plants that cannot grow vertically on their own due to the weakness of the woody tissues in their stems. Because of that, it relies on directing its growth upwards through various means, including wrapping the stem, which is tender as in ivy, and for the importance of climbers and purlins in external landscapes. It was used in "Green Walls", which is a system to connect the garden with the walls of the neighboring buildings, which is known as the green walls, which is an integral part of the natural landscape, as well as increasing the green landscape and increasing the aesthetic aspect (Rahim, 2012).

E- flowering herbaceous plants

A group of herbal ornamental plants that bloom beautiful flowers in different seasons and are planted in gardens, and are considered one of the most important elements of beautification, where they are the main source of colors in gardens. Some



of these plants have flowers suitable for picking. Therefore, they are planted to produce cut flowers. Flowering herbaceous plants are either annuals, which are considered one of the most important and most widely used herbal plants, where their life cycle of vegetative growth, flowering, and seed formation takes place in less than a year and are known as annuals or two years (Biennials), which complete their life cycle in two years or remain in the ground for more than two years, are known as perennials. Perennial herbaceous plants are used a lot in landscaping public and private gardens, but their types are limited compared to the types of annual plants, so they are used with the use of annual species (Al-Dabaa et al., 2004).

F- Flowering bulbs:

It is a diverse group of ornamental plants that belong to many botanical families of monocots and dicotyledons, all of which give beautiful flowers, some of which are aromatic. It is considered a good source for the production of commercial cut flowers, as well as being of great importance in landscaping (Al-Dabaa et al., 2004).

G- Cactus and succulent plants: Succulents and Cactus plants

It is a group of plants that include Carnivorous, succulent, and Cardueae from cacti and succulents species that grow naturally in the desert, mountainous and dry areas. It is characterized by special characteristics of its endurance to high temperatures and low air humidity as a result of the presence of its own mutations that help it live in its environments. These plants are used in rock gardens as cacti, agave, and Yucca (Abu Zeid, 2008).

H- Aquatic and semi-aquatic plants

Aquatic plants are a group of annual and perennial plants that live afloat or submerged in stagnant and running water - and are used in landscaping water gardens as well as in public gardens. Semi-aquatic plants, are a group of plants that are well grown in humid places, near waterways and on the edges of water bodies, and aquatic and semi-aquatic plants, some of which are flowering, such as lotus and Nile rose, and some are vegetative. (Hyena et al., 2004).

I- Lawns

They are small and short creeping herbaceous plants, growing next to each other, forming dense

branches and leaves, and spreading quickly to cover all the ground on which they grow, forming a beautiful green carpet, and characterized by their ability to cut where they have the ability to quickly restore growth. It is also characterized by the endurance of walking on it, and Lawns occupy a large percentage of the area in the gardens, which may reach 70% or more, and It depends on the type of garden and what is the purpose of its use (Al-Dabaa et al., 2004; Noah, 2011).

The role of water in the design and landscaping

Landscaping and design specialists considered the water element to be an aesthetic element due to its movement and sound, as well as the reflection of surrounding images, and its effect on softening the atmosphere, especially in hot and dry areas. Where they used water in several ways in line with the nature of the places where water is intended to be introduced into the external landscapes of their public and private gardens, and water has a great role in creating the element of attraction and drawing the attention of gardeners, especially in hot areas where garden design engineers use water in several forms, including basins and fountains as well as waterfalls and planting plants are close to them, which creates very impressive and beautiful scenes by reflecting the images of those plants in the water (Mahmood, 2003). And the water in the external landscapes of the university campus has a role in creating an element of meditation for the visitors of those landscapes through the movement of air and its contact with water, which forces it to move. The water works on adding the element of visual linkage between the external landscapes of the university buildings through the flow of water in the channels connecting those buildings (Motloch, 2000).

Artificial Landscape Components

The artificial components of gardens and eternal landscapes are considered accessories, whether technical or architectural, complementary in the design of these gardens and landscapes, without which coordination and design of gardens and eternal landscapes cannot be completed, and with which the artistic painting drawn by the designer is completed, which raises the aesthetic aspect as well as increases its functional efficiency. Among these components are:



Campus Gates

The gates are the symbol of the educational institution and the physical expression of welcome and farewell. They may express the aesthetic aspects or, through their design, may refer to a local cultural vocabulary. The campus gates refer to functional and aesthetic goals. (Dober, 2000).

University Walks

The main purpose of the corridors and walkways is to link the parts together, which is the main way to move from one place to another, and it must be taken care of at the beginning of the design, and the way the corridors and walkways are designed has a great impact on showing the beauty of the gardens. Each corridor or walker must end with a specific goal, be comfortable, clean, and not accumulate water. The width of these walks varies from 1.2 m to 4 m depending on the place in which they are located.

Water network and irrigation in gardens

Maintaining the permanence of the gardens, their spectacles, the beauty of their plants, and the bright colors of their flowers, all of this depends primarily on the availability of water for these gardens. The availability of water depends on the irrigation network and how it distributes water between the different parts of the garden and ensures that plants receive the appropriate quantities for their continued growth. The planning and distribution of irrigation networks depend on several factors, including the area of the garden and the nature of the soil surface, as well as the geographical location of the garden and its presence in cool or temperate areas, and how the water is allocated for irrigation is distributed or the presence of lakes and fountains within the garden design (Al-Chalabi, 1990).

Movement barriers

One of the important design elements in gardens and open landscapes, where they are considered barriers to impede movement and direct it, as well as working to increase the aesthetics and increase the pleasure of the beholder. The designer may seek to expand the landscapes by linking these barriers to the seating benches and also to provide lighting for times. Light sources can be linked with these barriers (Obeid, 1981).

Seating

It is obvious that the garden includes places to sit, rest, relax and enjoy the view of flowers and plants, as well as fountains and lakes. In general, the seating places should be comfortable for the seated person. The seats may be fixed and have multiple shapes and sizes, and they may be made of stone, concrete, wood with iron, or even from half-stems of trees. In general, it must be taken into account the necessity of determining the best places for the presence of these seats in order to achieve their purpose, which is to see the best and widest views from this place (Al-Qai'i, 2007).

Sheds

It is considered one of the architectural structural elements whose presence increases the aesthetics of the gardens. It may be made of wood, iron, or both. Climbers rely on it to add a natural aesthetic to the garden and are also used to provide areas of shade. (Mahmoud and Amin, 1989).

Tags

They are explanatory signs that help the visitors of outdoor spaces to reach the places they want easily, 2991 which creates a sense of comfort and reassurance for them.

squirts

It is considered one of the important attractions in the gardens and outdoor spaces because it adds a sense of joy and life. It also increases air humidity, especially in hot areas, and adds pleasure to the visual and sensory components (Mahmoud and Amin, 1989).

carvings

It is one of the elements that can give more than one function when placed in external landscapes and gardens. It adds aesthetics and the designer uses it as an attractive element in the design. In addition, it may refer to a symbol or give a historical picture of the place you are in (Noah, 2011).

lighting

The role that lighting plays in providing night lighting in the gardens and adding an aesthetic vision to these gardens is due to the diversity of their forms. It is attached to other elements in the garden such as seating benches and on the sides of



walkways, as well as fountains, which made it an important element in landscaping and designing gardens (Al-Chalabi, 1990).

Rubbish container

They are considered very necessary to maintain the cleanliness of gardens and green landscapes. They are usually plastic or metal boxes of different sizes and shapes that are installed on electricity poles, lighting poles, or on walls, or they are mobile containers that are used temporarily, and they are distributed near movement corridors or sitting places. and kiosks, and their selection depends on cost and appearance (Obeid, 1981).

Parking

It is considered necessary to provide it within the external landscapes of the university campus for easy parking for university visitors, including faculty, staff, students, and visitors, and its presence near university buildings is considered good, but it is not necessary (Unesco, 1975).

Questionnaire

Questionnaires are considered one of the important methods in design studies because they achieve clarity in answering the questions asked, provided that the designer takes into account the specialists that the questions of the questionnaire are consistent with the social reality of the city, which includes the study site, as well as to be consistent with the environmental conditions of that city. In addition to this, field visits by the researcher to the study site and access to the architectural plans, so that these questions contribute to the development and improvement of the study site in line with the aspirations of the target groups. The questionnaire form for the included categories (professors - students - employees) was prepared, and it was evaluated linguistically and scientifically by a group of experts and specialists from the faculties (agriculture - engineering - basic education - fine arts) and it was produced in the final form, and the questionnaire was circulated electronically to the groups The targeted, as it was circulated to the college professors and students (except for the first stage students) by the Presidency of the Department of Horticulture and Landscape Engineering through the Council of the Faculty of Agriculture. As for the college staff, the questionnaire was circulated by the Associate Dean for Administrative Affairs, Subsequently, responses

were received electronically. The responses were received after two months of the circular.

Table 1. The number of target groups

Categories	Numbers
number of professors	280
number of students	753
Number of Employees	166

(Human Resources - College of Agriculture - University of Basra)

The responses received amounted to 205 responses, which constituted 17% of the total number of the target groups in the study (Table 1). The data was manually unloaded in Microsoft Excel 2010 and then analyzed statistically using a test model (Chi-Square) to extract the results in an accurate scientific manner by using the statistical program for Social Sciences (SPSS V.11) Statistical package social science.

Results and discussion

Table (2) shows that there are significant differences after conducting the statistical analysis using chi-square under the probability level (0.05), 2992 where the results about gender showed the percentage of males, which amounted to 60%, compared to the percentage of females, which was 40%, which are relatively close, and as a result, the researcher believes that the two genders have an important role in the activity that takes place in university external landscapes, whether they are cultural or social activities.

Table 2: Data of the number and percentage of the studied groups by gender and according to the questionnaire

Gender	Number	Percentage
male	123	%60
female	82	%40
Total	205	%100
Value (Chi-Square)	2	
	p<0.05	

From table (3), the results of the percentages for participants from the target groups were (54%) for students, (14%) for employees and (32%) for professors. These results are consistent with (Rahim, 2012) who indicated in his study that the university consists of individuals, and they are the ones who are active in the use of external university landscapes, thus they are one of the



influences in the design process of those university landscapes. The researcher believes that this result came from the fact that students represent the largest group among the other groups present on the university campus.

Table 3: data of the number and percentage of the studied groups by profession and according to the questionnaire.

Occupation	Number	percentage
teaching	65	%32
employee	29	%14
Student	111	%54
the total	205	%100
Value (Chi-Square)	24.33	
	p<0.05	

The researcher believes that the convergence of the percentages between the preferences "trees and shrubs - flowers - green areas" is one of the natural design components that work to increase the aesthetic design of gardens, especially since the diversity among them breaks the feeling of monotony and boredom. The researcher also sees the preference for trees and shrubs as the highest percentage, because they serve to soften the atmosphere and shade places, especially since the study site is located in the city of Basra, which has very hot weather. This is consistent with (Abbawi, 2011) that trees and shrubs have several environmental and aesthetic functions when they are a design element and a coloring element because of their formal and seasonal features.

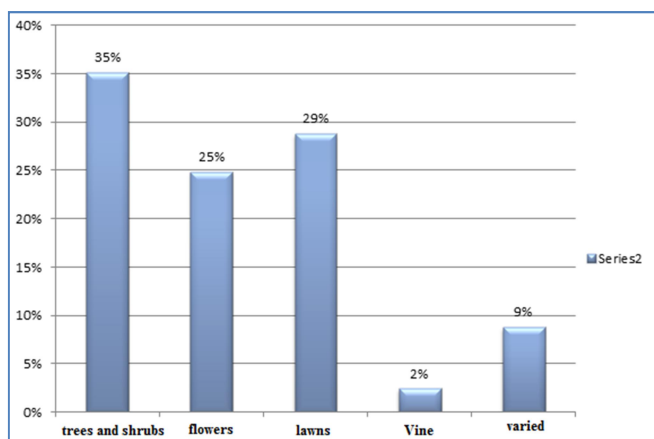


Figure 1: The sample included in the questionnaire about the preferred plants to see in a garden.

The statistical analysis using chi-square and below the level of probability (0.01) shows that there are significant differences between the preferences for the questionnaire question "Do you want the college gardens to contain", which referred to the topography of the garden land for the study site. Figure (2) shows the respondents' agreement on choosing the "diverse" preference and their percentage was (58%), while the "level" preference received a percentage of (25%) and the "highs and lows" preference (18%) of the target groups agreed on it. The researcher believes that the largest percentage of respondents' agreement on the preference for "diverse" came to the desire of garden users to create a sense of movement up or down or on flat ground, which makes these differences in the level of the ground helps to give the extra a kind of dynamism and works to increase the aesthetic aspect in the design Those gardens, and this is consistent with what he indicated (White, 2001).

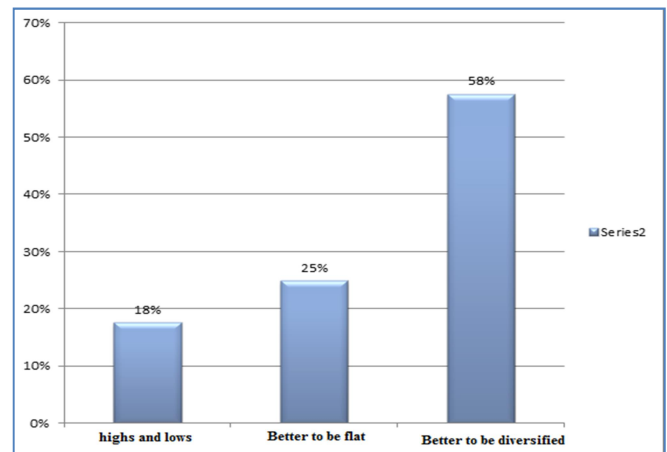


Figure 2: Sample survey on whether the park contains the preferences in the question.

Statistical analysis using chi-square shows that there is no significant relationship between preferences. The question that was asked to the respondents was, "What do you think of the green surface in your college garden?"



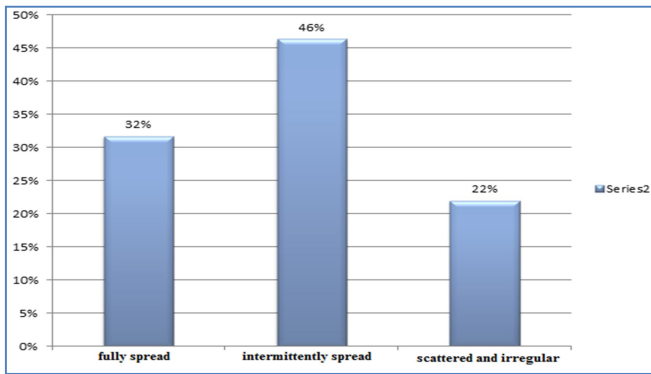


Figure 3: The sample included in the questionnaire according to the opinion in the form of the green flat in the garden.

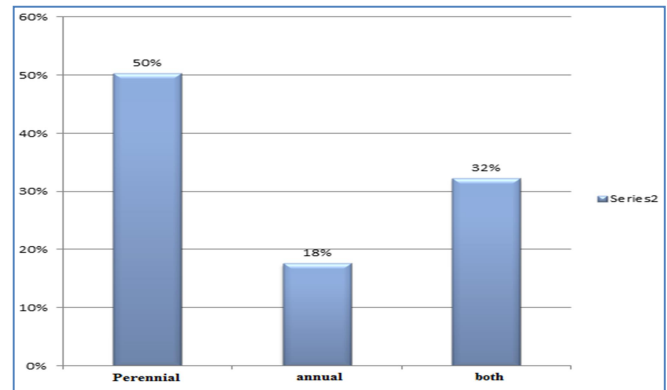


Figure 4: The sample included in the questionnaire according to the nature of the college garden trees

because lawns are considered a natural element that improves the local climate and stabilizes the soil by covering it and giving a sense of psychological comfort to garden users (Abu Dahab and Tariq, 1998). The researcher believes that 46% of the target groups agreed in the questionnaire that the green area was (spread intermittently) Figure (3). the hot weather conditions in Basra city of greatly affected the green areas, and the neglect and lack of maintenance, helped those environmental conditions to lose green areas the purpose of their existence as a natural element within the design of the garden. it turns out to us from the statistical analysis using chi-square and under the probability level (0.05) that there is a significant relationship between the preferences for the item within the questionnaire. Figure (4) shows that the respondents (50%) agreed to choose the preference " Perennial" in relation to the desire of the surveyed groups to see trees in the garden. The researcher believes that this high percentage came to compensate for the things that garden users miss, such as providing shade, working as wind and dust barriers, softening the atmosphere, and working to reduce the noise resulting from the movement of cars. This is for the location of the study on the main internal roads of the complex (Karmat Ali). This is consistent with (Jassim, 2004).

After conducting the statistical analysis and using (Chi-Square) at the probability level (0.01), there are significant differences between the preferences for the above paragraph in the questionnaire. Figure (5) shows that among the surveyed groups (67%) of them agreed on the preference for "diverse" to answer the question (What is the nature of the colors you would like to see in the college garden flowers?). The researcher believes that this high percentage of preference (diverse) 2994 came from the desire of garden users to break the boredom and monotony that exists as a reality for the garden of the study site, in addition to creating color diversity due to the diversity and multiplicity of colors possessed by the flowers. This is consistent with (Al-Qaiyi, 2007) that the color diversity of the elements in the garden enhances the aesthetic aspect and visual effects, which increases the joy and pleasure of the garden users.

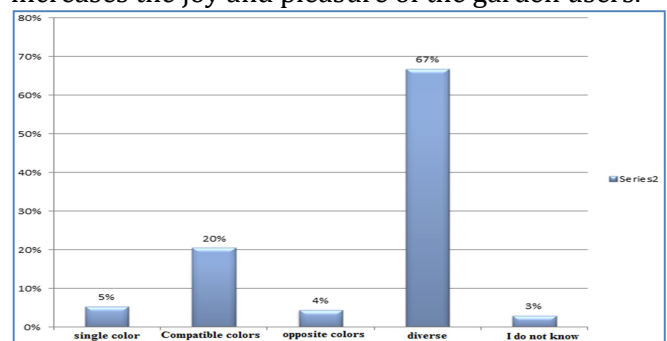


Figure 5: The sample included in the questionnaire according to the colors of the flowers in the garden

After conducting the statistical analysis and using the chi-square, there was no significant relationship between the preferences when the respondents were asked, "How would you like to



see the water element in the garden?". Figure (6) shows that a percentage of the respondents agreed on their desire to see the water element in the garden of the study site in the form of "fountains" and their percentage was (38%), while another section of the surveyed groups followed suit and their percentage was (35%). The researcher believes that the convergence of the percentages between the preferences indicates the desire of the garden users of the study site to see the water element in any form, but the basis is the presence of water within the garden design. This desire is very necessary, especially that the study site, which is within Basra city, suffers from high temperatures. The presence of water, in addition to its aesthetic and sensory effect, works to soften the atmosphere and reduce heat in areas that suffer from high temperatures. This is consistent with (Noah, 2011).

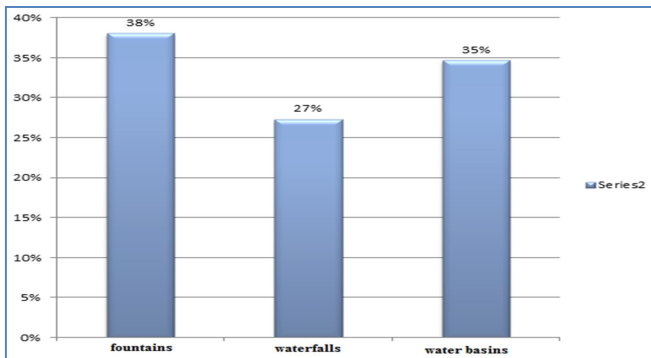


Figure 6: The sample included in the questionnaire according to the preferred form of seeing the water element in the garden

The statistical analysis using chi-square showed a significant relationship between the preferences for the above paragraph within the questionnaire and under the level of probability (0.01). Figure (7) showed us the percentage for the results of the questionnaire about the question that was directed to the respondents in this paragraph, "What do you prefer to have as an attraction in the garden?" Where 49% of the surveyed groups agreed that the attraction element in the garden of the study site is the preference "tree", while 38% of them agreed on the preference "a fountain" and 13% agreed that the element of attraction is a "statue". The researcher believes that the agreement of the largest percentage on choosing the tree as an element of attraction is the result of man's tendencies and his attachment to nature, which has

sensory and psychological effects on humans. Choosing the tree as an attraction, this tree must have advantages, whether it is evergreen or capable of being cut and formed, or it has an emotional connection with the people of the city, such as the palm and its symbolism for Basra citizens.

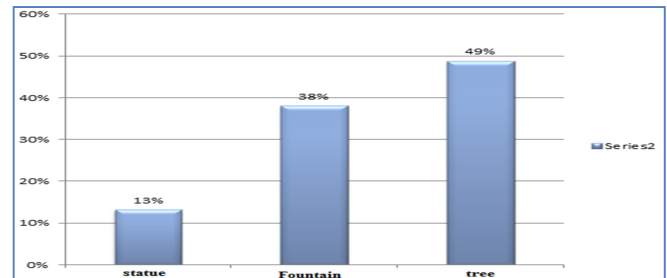


Figure 7: The sample included in the questionnaire according to the preferred to see it as an attraction in the garden.

It was found through the statistical analysis that there are significant differences between the preferences of the above paragraph within the questionnaire, using the Chi-Square and below the level of probability (0.01), It is clear from Figure (8) that the preference "both" is superior to the rest of the preferences within the above paragraph, and it obtained the percentage (58%) from the total percentage of the surveyed categories. The researcher considers the superiority of the preference that calls for the presence of diversity in the type of trees preferred to be seen in the garden of the study site, including ornamental trees and fruit trees, as a result of the desire of the garden users to the presence of the element of visual diversity, and the trees have effects from an aesthetic, environmental and dynamic point of view. Trees are also one of the natural components of the external landscapes, which are used by the designer in designing the garden and achieving its functional goals.

2995

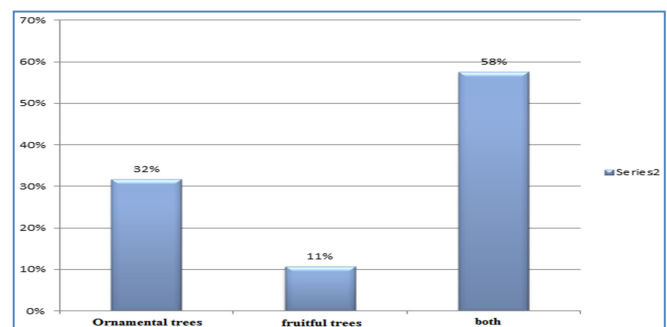


Figure 8: The sample included in the



questionnaire according to the preferred type of trees in the garden.

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