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URBAN SOCIALSCAPE AS A SCALE TO EVALUATE STUDENTS' NEEDS IN UNIVERSITY CAMPUS

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ABSTRACT

Sustainable development as well-known, is attached to many research fields like urban landscape. Unfortunately, the urban landscape sometimes is considered unnecessary element. For, example, on university campuses, attention is only paid to buildings while neglecting the outdoor spaces's significant role. Achieveing needs from the urban landscape on campus can help students cope with negative feelings such as stress. Many researchers proposed different scales to evaluate achievement of students' needs from the urban landscape. However, as far as we know, such scales concentrated on specific needs to measure. Accordingly, this study aims to propose an integrated scale able to evaluate achieving a combination of students' needs (physical, mental, psychological, social, place attachment) that required from the urban landscape on campus. Also, proves the relationship between lack on achieving needs on campus and negative feelings' existence. A triangulation methodology represented in literature review, field observation, and questionnaire, had been applied. As a result of 1692 valid questionnaires, the Urban Socialscape Scale-USS which consists of 38 items and divided into four subscales, was proven to be a valid and reliable tool. In conclusion, the study proved that neglecting achieving needs from the urban landscape on campus is partially responsible for students' negative feelings. The current study came consistent with sustainable development's 3rd goal which is, achieving human well-being as it concerns to acheving students needs and reduce the negative feeling impact as it pays attention to achieving students' needs to reduce the negative feelings' impact.

KEYWORDS: Urban Landscape, Sustainable Development, Human Needs, Urban Socialscape Principles, Urban Socialscape Scale, Negative Feelings.

البعد الأجتماعي لتنسيق المواقع العمرانيه كمقياس لتقييم إحتياجات الطلاب في الحرم الجامعي

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الملخص

كما هو معروف ترتبط التنمية المستدامة بالعديد من المجالات البحثية مثل تنسيق المواقع العمرانية. ولكن من المؤسف أن في بعض الأحيان يتم إعتبار تنسيق المواقع العمرانية عنصرا إضافيا. ففي الجامعات على سبيل المثال، يوجه الاهتمام نحو المباني الاكاديمية بينما يتم إهمال الدور الفعال للمناطق الخارجية. فعندما تحقق تنسيق المواقع العمرانية في الحرم الجامعي الإحتياجات المطلوبه فإنها تساعد الطلاب علي التغلب على المشاعر السلبية مثل التوتر. أقترح العديد من الباحثين مقاييس مختلفة لتقييم مدى تحقيق تنسيق المواقع لأحتياجات الطلاب. ومع ذلك، على حد علمنا، ركزت تلك المقاييس على تقييم احتياجات محددة للقياس. وعليه تهدف هذه الدراسة إلى اقتراح مقياس متكامل قادرعلى تقييم مدي تحقيق المناطق الخارجية لمزيج من إحتياجات الطلاب المختلفة (ماديه، ذهنية، نفسية، إجتماعية، إرتباط بالمكان) اللازم تحققها من تنسيق المواقع العمرانية في الحرم الجامعي. كما تهدف الدراسة الي إثبات العلاقة بين عدم تحقيق الاحتياجات داخل الحرم الجامعي ووجود المشاعر السلبية. تم تطبيق منهجية ثلاثية الابعاد متمثلة في مراجعة الأدبيات، والملاحظة الميدانية، والإستبيان. ونتيجة لـ 1692 استبيانًا صالحًا، ثبت أن مقياس البعد

الاجتماعي لتنسيق المواقع العمرانية، الذي يتكون من 38 بندًا مقسمة علي أربعة مقاييس فرعية، هو أداة صالحة وموثوقة. وبالفعل أثبتت الدراسة أن تجاهل تحقيق الإحتياجات اللازمة داخل الحرم الجامعي مسؤول جزئياً عن المشاعر السلبية لدى الطلاب. وجاءت الدراسة الحالية متوافقة مع الهدف الثالث للتنمية المستدامة وهو تحقيق رفاهية الإنسان حيث اهتمت بتحقيق إحتياجات الطلاب للحد من تأثير المشاعر السلبية.

الكلمات المفتاحية : : تنسيق المواقع العمرانية، التنمية المستدامة، الإحتياجات الإنسانية، مبادئ البعد الإجتماعي لتنسيق المواقع العمرانية، مقياس البعد الإجتماعي لتنسيق المواقع العمرانية، المشاعر السلبية.

1. INTRODUCTION

Sustainable development as well-known is the development that ensures achieving human needs. It consists of three dimensions social, environmental, and economical that attach to many aspects of life such as the urban landscape [1]. The urban landscape social dimension expresses the relationships between people and land [2]. It concerns to many social aspects such as human behavior [3,4]. Human behaviors include many psychological responses such as feelings [5].The surrounding environment represented in the urban landscape can shape people's feelings and behavior [6]. Landscapes in general, refer to an area that humans perceive [7].

The Urban landscape in university campuses are like any other urban open spaces in a city context, but on a smaller scale. Both consist of buildings, paths (pedestrians and vehicles), and open spaces [8,9,10]. Unfortunately, when designing universities in third-world countries, especially governmental ones, attention is only paid to buildings while neglecting the impacts of outdoor spaces on students' behavior [11]. In university design, the outdoor environment (macro-scale) is never less important than the classroom environment (micro-scale) as both have direct impacts on students [12]. Especially because outdoor spaces in university are always rememberable [13].

University students represent the future of any community. Improving and promote positive feelings such as generating happiness is an important factor the same as education [14]. Unfortunately, many studies proved that those students are suffering from many negative feelings, such as anxiety, stress, and fatigue [15,16,17]. The American College Health Association in 2019, confirmed that 62% of university students had anxious feelings while 45% suffered from depression [18]. Many reasons may cause such negative feelings such as being away from home [19], and studying for long periods [17,18,20]. Whatever the reasons are, it is very important to pay attention to reduce the impact of such negative feelings. Most of time such negative impacts refer to the physical environment that the individual deals with [20]. Therefore, the study's scope pointed to the urban landscape on campus as the environment that can helps students cope with negative impacts such as stress by meeting their needs [9,16,21]. Many researchers proposed different scales to evaluate the achievement of needs from urban landscape. However, as far as we know, such scales concentrated on urban aspects or measuring specific needs. In 2022, a framework called Urban Socialscape Framework was proposed to cover needs from the urban landscape [22]. It consists of 5 general theoretical principles; achieve physical needs, motivate mental health, improve psychological status, support social relationships, and emphasize place attachment [22]. This study aims to identify student's needs on campus to form a scale able to measure the degree of achieving needs by adopting "Urban Socialscape framework". In addition, exploring if the level of achieving needs on campus on the selected case study can be responsible for negative feelings or not. Also, identify the most effective elements, activities, and qualities that their absence may have a great effect on the negative feelings. The current study came in line with the 3rd goal of

sustainable development which is, achieving human well-being due to paying attention to reduce the impact of negative feelings by meeting students' needs.

Urban landscape on university campus:

Landscape according to the European landscape agreement consists of two types which are anthropic landscape represented by urban landscape, and natural landscape represented by all the features that exist without the slightest interference of human [1]. The urban landscape is closely attached to sustainable developments due to its concerns with many social, environmental, and cultural aspects [1]. The urban landscapes with high quality can achieve many social or human aspects such as generating happiness and achieving mental relaxation [1]. Urban landscapes usually exist everywhere whatever the project's type, residential, recreational, educational, .. etc.

This study focuses only on educational urban landscape, specifically university campuses. The well-designed campus comes as a result of cooperation between many majors such as landscape architecture, architecture, and urban planning [13]. Sustainable development on campus aims to enhance quality of life by achieving the needs of current users while avoiding the negative impacts of future ones. Students' needs on campus consist of visible needs such as elements and invisible needs such as comfort. The physical (visible) environment on campus consists of [10, 11]:

1) Fixed environments such as buildings, paths, and spaces.
2) Half-fixed such as green areas and furniture (i.e. benches, kiosks, etc.).
3) Non-fixed such as behaviors, activities, transportation, and users.

The half-fixed and fixed affect users' behaviors greatly [11]. Many studies proved the importance of spending time outdoors, for a long or short period, physically or even virtually, in enhancing cognitive abilities and psychological conditions by reducing stress and mental fatigue [18,23,24].

Students' needs from urban landscape on university campus:

Many prior studies investigated students' needs from the urban landscape on campus that may have impacts on negative feelings. Accordingly, some of those studies that are related to the urban landscape on campus will be addressed to extract such needs as shown in **Table 1**.

Table 1. Some studies related to students' needs on campus & their impacts on feeling

Study	Needs	Impact
Tawfik Mohamed, et al. 2023	Achieving students' basic needs (such as physiological & functional), and advanced needs (such as aesthetic & cognitive quality) on campus able to [25]:	• Achieve quality of life that in turn reduce negative feelings. • Raise satisfaction.
Chen, Huojin, et al. 2023	Outdoor activities such as physical activities, mental activities, social activities, and landscapes contribute to [26]:	• Reducing negative feelings such as stress and anxiety. • Supporting positive ones such as happiness, and calming.
Xia, Jin, et al. in 2023	Achieving functionality, having vegetation, and adopting design participation to meet students' needs (i.e. places for resting and studying) are able to [27]:	• Reduce pressure (stress). • Support social interaction. • Encourage joining outdoors.
Działek, et al. in 2023	Achieving needs such as functional and attractive characteristics, spaces for social gatherings, suitable seat arrangement, comfort, green areas, and shaded areas, are able to [28]:	• Offers relaxation. • Offers mental fatigue recovery. • Creates a sense of identity. • Supports social gathering.
Qunyue Liu, et al, 2022	Perceiving green spaces encourages the use of outdoor spaces that in turn [29]:	• Support social interactions. • Restore psychological status.
Ibes, Dorothy C. et al, 2022	Spending time in outdoor spaces studying and chatting, causes unconscious perceiving that [18]:	• Reduces negative moods which in turn enhances mental and psychological condition.

El-Darwish, 2022,	Having a pedestrian spine away from car movement that has elements like green spaces & sitting areas, can offer social places that [11]:	• Encourage activities. • Support social relationships due to reduce students' stress.
Ha, Jaeyoung, et al, 2021	Green spaces' biodiversity and nature sound achieve a restoration effect that in turn [15]:	• Enhance psychological responses like depression.
Yi Liu, 2021	Achieving functionality, aesthetics, having greenery, and proper location for elements, are able to [30]:	• Achieving satisfaction.
Wang, Ronghua, et al. 2021	Landscape physical features, aesthetic and recreational value, and the existence of vegetation, are able to [31]:	• Encourage activities that in turn enhance life quality.
Hami, Ahmad, et al. 2021	Large amounts of softscape, and shaded sitting areas are able to[24]:	• Encourage engaging activities • Improve psychological status.
Foellmer, 2021	Green spaces on campus that offer physical, activity, symbolic, experienced, and social spaces are able to [16]:	• Reduce stress. • Create belonging feeling. • Improve moods. • Stimuli positive feelings.
Hani, Lamis, et al. 2020	Suitable landscape elements on campus can [8]:	• Generate positive emotions such as happiness.
Loder, Alexander KF, et al. 2020	Perceiving natural settings have significant effects in, [32]:	• Improving mental health.
Maryam Lesan et al. 2020	A well-designed campus that achieves needs such as shaded, comfortable, and well-arrangement seats, beautiful scenes, and quiet relaxing spaces, can [9]:	• Increases social interaction. • Emphasizes belonging sense. • Raise space' desirability.
Gulwadi, et al., 2019	Perceive green spaces that are supported by pedestrian paths, sitting areas, and activities contribute to [19]:	• Improving life quality and psychological status.
GhorbanzadehMojgan 2019,	Outdoor spaces that achieve needs while being understood, desirable, enjoyable, and compatible, encourage students to join which in turn [20]:	• Supports social relationships. • Enhances belonging sense.
Menatti, Laura, et al. 2019	Using natural landscapes even in urban environments contribute in [7]:	• Creating person-place bonding. • Achieving place attachment
Holt, Elizabeth W. et al., 2019	Supporting active use such as walking and encouraging spending time outdoors are able to [33]:	• Reduce stress levels. • Generate happiness feeling.

Depending on the studies mentioned below in **Table 1** there is a deep relationship between achieving needs from the urban landscape on campus and reducing negative feelings. As far as we know, none of the mentioned studies adopted the integration of achieving all needs together the same way as the Urban Socialscape Principles [22]. According to the studies above, the needs required on campus and have impacts on negative feelings can be sorted according to the urban socialscape principles as follows:

1) Achieving physical needs that are related to achieving items like green areas, [15, 16, 24, 27, 28, 29, 30, 31], functionality [25, 27, 28, 30], aesthetic quality [9, 25, 30, 31], active activities [26, 33], studying places [18, 27], shaded areas [9, 24, 28], pedestrian spine [11], sitting areas [9, 11, 24], recreational activities [31], and imageability [20].
2) Achieving psychological needs that requires for example having quiet places for resting and relaxing [9, 25].
3) Achieving mental needs that requires some conditions such as having quiet and fascinating places for mental activities such as meditation and restoration [26].
4) Achieving social needs that requires for example having places with suitable seating arrangements [11, 28] and safe pedestrian spines [11] to meet social activities such as chatting [18], meeting friends [26], and social gatherings [28].
5) Achieving place attachment that requires for instance having fascination places with attractive characteristics [28] and softscapes [7].

Identifying how to measure urban socialscape framework's five principles (the essential needs as proposed) will be investigated in detail later in point (2.2.2 measures) to form the urban socialscape scale (USS).

2. MATERIALS AND METHODS

The authors followed a triangulation methodology that Matloob's study in 2018, and Hanan's study in 2013 used [34,35]. Such triangulation methodology in this study is represented in, the literature review (mentioned aforementioned in the introduction), field observation, and questionnaire.

2.1. Field observation:

Before talking about the field observation, identification first with the selected sites' location that aimed to be studied is important.

2.1.1. Site location

Four sites at Al-Azhar University in Cairo, Egypt, had been selected to be included in this study, which are the faculty of pharmacy for boys, faculty of pharmacy for girls, faculty of engineering for boys, and faculty of engineering for girls, as shown in **Fig.1.** Al-Azhar University is the third oldest university in the world. It has many branches in different cities in Egypt but the main one is located in Cairo [36].

Al Azhar University in Cairo, Egypt is divided into two campuses one for girls and one for boys [36]. The girls' campus contains all faculties for girls. However, the faculty of engineering for girls is located on the boys' campus but surrounded by a fence to be separated from the boys' campus. In other words, the outdoor spaces around the faculty of engineering for girls can be considered as a separate campus by itself. The two majors, pharmacy and engineering, were chosen as they seem to be similar in some aspects. Both do not have enough time to sit outside due to high workloads (depending on random interviews) and have the same studying periods. Also, engineering and chemistry are hard sciences, and students in such majors are supposed to suffer from stress more than other students [19].

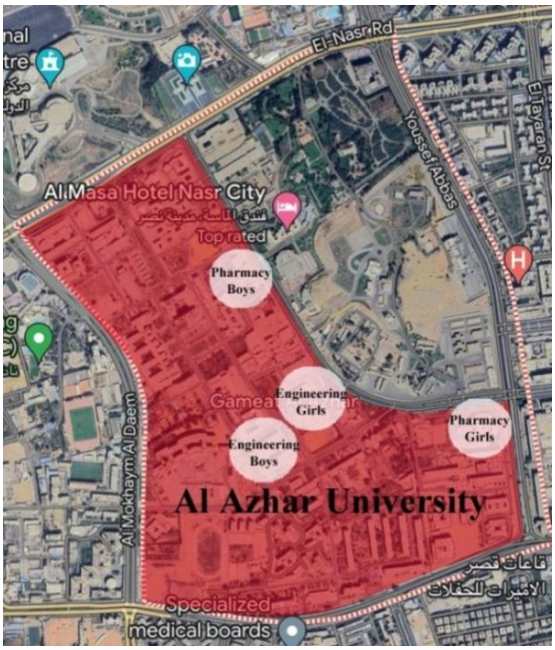

Fig.1 Al Azhar university site and case study locations

2.1.2. Field observation for negative feelings and site:

Observation for negative feelings: Due to the direct connection with the students some negative feelings were observed such as stress and sadness among students on the faculty of engineering for girls, on the contrary, students on the other three sites. In addition, sometimes students self-reported that they suffer from negative feelings.

Observation for sites: Such observation was documented using photographs and taking notes. The photographs were taken at the beginning of December 2022 around 10 am on the same

day for the four selected sites, as shown in **Table 2.** According to the sites observations, the urban spaces on the faculty of engineering for girls (site a) around the students' building were empty most of the time and did not meet the required needs at all such as near cafeterias and shaded seats. In the other three sites (b,c,d), students were found using outdoor spaces for different activities such as studying, standing, and chatting with friends, while the level of achieving needs varied.

According to Lau, Stephen's study in 2014, when campus outdoor spaces fail to meet users' demands it causes some kind of stress that in turn affects negatively many students' aspects [37]. So, maybe this lack of achieving needs in the outdoor spaces around the faculty of engineering for girls is responsible for such negative feelings and not using the outdoor spaces that were noticed. Especially because there is no other nearby outdoor space available to use except the one surrounding their building, as it is considered the whole campus to them.

Table 2 selected sites (photographs were taken around 10 am at the same day)

(a) Faculty of engineering for girls: The outdoor spaces were empty most of the time. Students who exist in outdoor spaces were just passing (nessessry activity).		
(b)Faculty of engineering for boys: Just a few students sit at the building's entrance chatting (social activity).		
(c)Faculty of pharmacy for girls: Many students sit at the building's entrance while others sit in sitting areas in front of the entrance eating, chatting or studying (social & optional activity).		
(d)Faculty of pharmacy for boys: Many students sit on the grass at the building entrance while others sit in sitting areas in the backyard, chatting or studying (social & optional activity).		

2.2. Questionnaire:

A questionnaire was used to evaluate the level of negative feelings and use of outdoor spaces. In addition, measuring the level of achieving needs on campus using a proposed scale called "Urban Socialscape Scale - USS" that depends on the Urban Socialscape Framework mentioned in point 1. Such evaluation based on the students' points of view. Because depending on users' experience makes the evaluating tool more reliable [10, 11].

2.2.1. Procedure And Participant:

At first the institutional approval from the university was taken for applying the questionnaire and taking photos on campus. Then A pilot survey was launched on the 25th of February, 2023 for a week on thirty students to test the proposed scale "Urban Socialscape Scale - USS". Such a survey aimed to check questions' clarity, time, reliability, and validity [13]. According to the pilot survey results, scales used were reliable and valid. Also, all participants (100%) confirmed that the questions were easy to understand. One significant change was adopted in the questionnaire which is, the rating of some scales was changed from 7 points to 5 points, to become 5 points for all scales used in the questionnaire, as students mentioned that choosing from 7 points made them confused.

The questionnaire was formed using the simulation method (imaginary Scenario), as students were asked to imagine themselves taking a walk in the presented scenes shown in photographs around their academic building. The simulated walk is one of the famous, successful, and common methods that have been used [7, 14, 31, 38]. It enables researchers to predict the real feelings toward the environment that they seek to measure its impact [38]. Using photographs was commonly applied to measure impact of presented contents to simulate reality [24, 31, 33, 39, 40]. Especially, if those contents were for places visited before [40]. Each faculty was exposed to different photographs related to the outdoor spaces around their acadimic building.

A week before applying the questionnaire, the authors entered the classrooms and explained the aim of the study, illustrated the concept of outdoor spaces, and drew attention to their importance in one's life. The final version of the questionnaire was sent online a month after the beginning of the second semester (starting from 9th March 2023 till the 24th of March 2023). The questionnaire was sent using the WhatsApp application to the representatives of each stage in the four selected faculties. Using online surveys to evaluate the outdoor spaces on campus was commonly used in many previous studies [14, 15, 21, 33], as it represents a good alternative to face-to-face ones [15]. During questionnaire period, the representatives were reminded to resend the link to their colleges three more times after sending it the first time.

2.2.2. Measures:

At the beginning of the questionnaire, respondents were asked to agree to participate in the study (Ethical approval). Students were told that the questionnaire would be anonymous and that they could communicate with the researcher through the representative. The questionnaire mainly consists of three parts which are:

1) Behaviors (negative feelings - usage level of outdoor spaces)

Negative feelings: Researchers measure university students' psychological conditions using many scales such as POMS-SF of 37 items [15], WHOQOL-BREF of 26 items [16], PSS of 10 items [33], ZIPERS of 12 items [39]. While seeking to find a scale with as minimum items as possible, Kessler 6 (K6) was found. K6 is a quick tool that is reliable and valid to measure

psychological distress [41]. In the K6 scale, participants determine how often they feel nervous, hopeless, restless, so sad, that everything was an effort, and worthless during past thirty days [41]. The answers were applied on a Likert Scale of 5 points (1 refers to never while 5 refers to Always). The K6 score ranged from 6 (there is no psychological distress) to 30 (there is a high level of psychological distress) [41]. Accordingly, the authors were inspired by K6 to measure students' negative feelings.

Usage level of outdoor spaces: There are many researchers aimed to measure the usage level of outdoor spaces, by asking about the duration, frequency [16, 29], and Activity type (necessary, optional, and social) [31, 40, 42]. Accordingly, participants were asked to mention the most activity always did (just passing, waiting, studying or sitting, relaxing, chatting), duration (5 min or less - less than 15 min - from 15 min to 30 min. - from 30 min. to 1 hour - more than 1 hour), and Frequency (never – 1 to 3 times a month – once a week – from 2 to 3 times a week – more than 3 times a week).

2) Outdoor spaces Needs': (Urban Socialscape Scale – USS)

The Urban Socialscape Scale was formed depending on the literature review but will be tested according to students' points of view. This part aims to form a scale called "Urban Socialscape Scale - USS". Such scale seek to evaluate achieving needs required from urban landscape on campus in relation to Urban Socialscape Framework's principles. USS consists of four sub-scales as following:

a. Physical needs scale:

To form the physical needs scale, the authors used a literature review and design participation to determine common needs that may have positive impacts on feelings. According to the literature review, urban landscape's components on campus basically consist of activities, elements, and qualities [13, 35, 40, 43]. As for design participation, it is a mandatory step to determine the required physical needs that have been supported by the community [4]. In this context, an experiment was designed in fall 2021, to identify students' physical needs. 76 students in 2nd-year architecture at the faculty of engineering for girls were asked to develop their outdoor spaces. A specialized staff (1 professor, 2 lecturers, 4 lecturer assistants) worked with them to reach the most reliable design. According to their surveys and design ideas, there was a need to have cafeterias, green spaces, places suitable for gathering, relaxing, and studying, better shapes for gates and fences, shaded sitting areas, and entertainment areas such as playgrounds. **Fig. 2** below shows a sample from the students' work.

Fig. 2 A sample from the students' work as a part of the design participation

Inspired by the literature review, and design participation, the authors compile a list to form a physical needs scale on campus that consists of three factors, which are:

1) Elements (6 items): green areas, vehicle roads, pedestrian paths, sitting areas [1, 8, 13, 20, 21, 40, 43], gates and fences [8], and amenities and services such as Cafeterias [8, 10, 11, 40, 43]. Students were asked to determine their satisfaction level with the 6 elements. Answers were applied on a Likert scale of 5 points as 1 refers to Very dissatisfied while 5 refers to Very satisfied.
2) Activities (3 items): having quiet space suitable for studying, relaxing, etc. [8, 11, 16, 20, 31, 40, 43], having social space suitable for gathering [9, 13, 16, 31, 40, 43], and having recreational space suitable for recreational activities such as playgrounds [16, 31, 40, 43]. Students were asked to mention how they would agree with three statements related to achieving those activities. Answers were applied on a Likert scale of 5 points as 1 refers to totally disagree while 5 refers to strongly agree.
3) Qualities (9 items): functionality [9, 30, 35, 40, 43], walkability [13, 34 , 43], accessibility [8, 9, 13, 17, 34, 35, 43], imageability [17, 25, 35, 40], offering independence in movement [43], air quality [8, 34], sound quality [8, 15, 17, 40, 43], visual quality [8, 9, 13, 20, 30, 31, 35, 40, 43], and physical comfort quality [8, 9, 17, 20, 40, 43]. Students were asked to mention how they would agree with the level of the 9 items. Answers were applied on 5 points Likert scale, 1 refers to totally disagree while 5 refers to strongly agree.

b. Psychological and mental needs scale (Restorative needs scale):

Psychological needs can be achieved by offering relaxation spaces with natural elements to generate happiness and reduce disturbance moods such as stress [20, 29, 44]. As for mental needs, it can be achieved when a space draws attention to interesting things like trees that relax the mind from stress and mental fatigue [20, 44]. According to many studies, a place that offers relaxation and draws attention to interesting things is called a restorative environment [45]. Restorativeness is an expression that refers to the abilities of an environment to reduce stress and mental fatigue [7, 45, 46]. Many theories explain the effective role of nature on human restoration, such as supportive environment theory [46], psychoevolutionary theory [47], attention restoration theory, and stress recovery theory [26, 29].

There are many scales used to measure restoration such as perceived self-rated restoration scale of 17 items [29, 45], revised perceived restorativeness scale of 16 items [44, 45], short-version revised restoration scale of 8 items [45], and restorativeness scale of 26 items [15, 19, 21,48]. Inspired by the restoration scales' review especially the Short-version revised restoration scale (SRRS), the restoration scale was formed. The SRRS consists of four factors, physiological, behavioral, cognitive, and emotional [45]. The physiological factor was excluded because according to a recent study, its factor loading was low. [29] In the proposed restoration scale, students were asked to describe their response to nine statements related to the existing green areas around their building. Statements are related to; stay longer, visit more often, be interested in, pay attention to, decrease mental fatigue, increase concentration, offer good mood, offer relaxation, and take break from daily routine [45]. Answers were applied on a Likert scale of 5 points as 1 refers to totally disagree while 5 refers to Strongly agree.

c. Social needs scale:

To have successful social urban spaces, outdoor spaces should offer physical features such as sitting areas, playgrounds, grassy areas, recreational activities, functional needs, and aesthetic values [49]. The academic campus with green spaces can be a social place that supports social relationships between students that consequently have a positive effect on the students' feelings [16]. Inspired by some previous studies, the social needs scale had been formed [9, 50, 51]. Students

were asked to describe their agreement toward five statements related to the ability of outdoor spaces to achieve social aspects. Statements aimed to ask about; offer opportunities to gather [50], create memories [50], facilitate communication [50], enable enjoy spending time with friends [50], and seat arrangment to offer eye contact [9, 51]. Answers were applied on a Likert scale of 5 points as 1 refers to totally disagree while 5 refers to strongly agree.

d. Place attachment scale:

The philosophical concepts related to affective relationships between humans and places started to appear in the 1970s, such as Love of Place (Topophilia) in 1974 [52]. However, the person-place relationship is commonly mentioned as place attachment [7]. Place attachment is based on two factors. First, Place identity (emotional factor) which is the sense of belonging to a certain. Second, Place dependence (functional concept) which is the level of achieving needs from place [53]. There are many studies aimed to measure place attachment such as the abbreviated place attachment scale (APAS) of 6 items [53]. It is a quick, reliable, and valid tool [53]. Inspired by APAS, students were asked to determine the level of agreement on 6 statements divided into two factors. Place identity (feel attached to and part from, have a very special relationship, reflects identity), and Place dependence (the best that has everything I need, no other campus can compare with, wouldn't substitute with any other place) [53]. Answers were applied on a Likert scale of 5 points as 1 refers to totally disagree while 5 refers to strongly agree.

Finally, as shown in **Fig. 3**, the Urban Socialscape Scale (USS) has been formed, represented in 38 items divided into Four subscales to evaluate achieving students'need.

3) Urban SocialScape Map

In many studies, researchers used maps to ask participants to locate certain places such as relaxation places [11, 17]. The technique of using maps can be graphic (using maps) or verbal (using questions) [49].

Accordingly, In the third part of the questionnaire, students were asked five questions (using verbal technique) about the existence of places in the outdoor spaces around their academic building achieving the five essential needs, as shown in Fig. 3. Those five questions were proposed to be called the Urban Socialscape Map (USM).

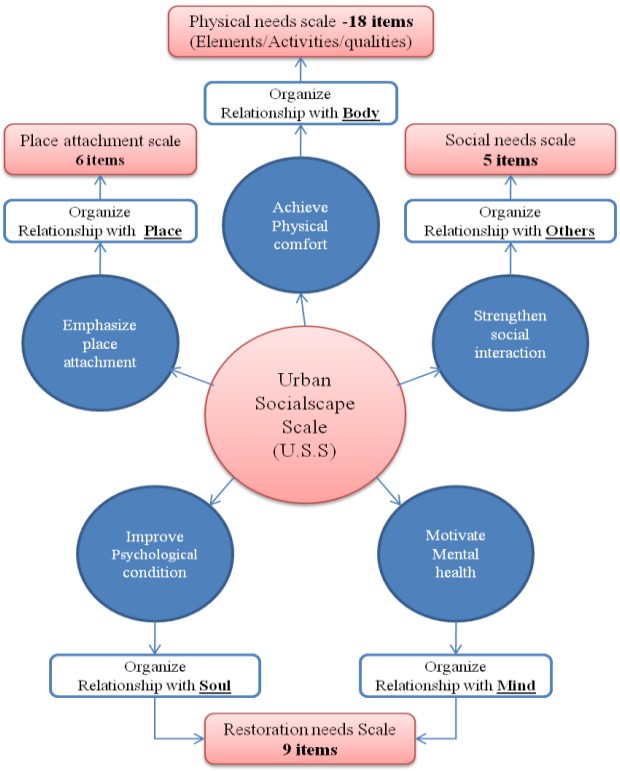

Fig. 3: Urban Socialscape Scale (USS)

3. RESULTS AND DISCUSSION

A series of statistical analyses took place to test the psychometric properties (reliability and validity), and find the relationship between negative feelings and the level of achieving needs,. The IBM SPSS, version 23 had been used to perform the statistical analyses. At first confirmatory factor

analysis were performed to determine the validity based on factor loadings of items in each scale. Then, Cronbach alpha (α) was calculated to test the internal consistency to test reliability. After that, the outliers were determined according to each scale to be removed before performing statistical tests. Also, some descriptive analyses were performed. Then, tests of relationship were established using simple regression models to find the relationship between achieving needs from outdoor spaces and negative feelings. Finally, relationship between items of elements, activities, and qualities of the physical needs scale and negative feelings were tested.

3.1. Sample size

The total number of responses to the questionnaire was 1744. Before performing any statistical analysis, the data have been cleaned. First, by removing who did not give ethical approvals which were 14 responses. Second, by removing outliers from each scale using box plots for each faculty separately, accordingly, 38 questionnaires were excluded. Finally, the total valid responses becomes 1692. A 729 (43.1%) female students participated from faculty of engineering for girls, 434 (25.7%) male students participated from faculty of engineering for boys, 312 (18.4%) female students participated from faculty of pharmacy for girls, and 217 (12.8%) male students participated from faculty of pharmacy for boys. For performing regression analysis the Sample size should be at least 109 participants [54]. So accordingly the study's sample size is perfect.

3.2. Psychometric properties of the scales

3.2.1. Validity

Confirmatory factor analysis, CFA usually takes place to confirm validity. When CFA indicates that the factor loading for the scale's item is higher than .5, that means that all items represent well each factor of the scale [15]. Accordingly, CFA was performed using the extraction method "principal component analysis (PCA)". At first, the ability to perform factor analysis was checked for all scales through KMO values (should be ≥0.5) and Bartlett's Test of Sphericity (Sig. value should be <0.05). The factor loading values shown in **Table 3**, confirmed that all items of the USS's subscales represent well their factors. In turn, such values confirmed validity for all subscales of USS, as all values of factor loading ≥0.5.

Table 3. Urban Socialscape Scale validity

Subscales	Factors	Items	Factor loading
Physical needs scale According to PCA, the scale is divided into 4 factors explains 69.5% from variation in the scale's items.	Factor (1) - 7 items Elements	Green areas	.676
		Vehicles parking and roads	.556
		Pedestrian paths	.662
		Sitting areas	.654
		Gates and fences	.671
		Services & amenity	.661
		Functionality.	.503
	Factor (2) - 3 items Movement qualities	Walkability	.662
		Offering independence	.776
		Accessibility	.696
	Factor (3) - 5 items Sensory qualities	Imagebility	.514
		Air quality	.794
		Sound quality	.779
		Visual quality	.658
		Physical Feeling quality.	.727
	Factor (4) - 3 items Activities	Activities required quite place such as take a break	.695
		Activities required Social place for gathering	.618
		Activities required Recreational Places	.775

Restorative needs scale According to PCA, the scale is divided into 3 factors explains 89.3 % from variation in items	Factor (1) - 5 items Psychological and mental needs	Take a break from daily routine	.987
		Feel in a good mood	.942
		Feel relaxed	.939
		Feel Better concentration	.916
		Feel less mental fatigue.	.875
	Factor (2) - 2 items Cognitive	Interested in	.997
		Attentive to	.585
	Factor (3) - 2 items Behavioral	Stay longer	.995
		Visit more often.	.921
social needs scale According to PCA, 2 factors explains 83.1%	Factor (1) - 3 items Support social Relationship	Create memories	1.012
		Offer communication	.787
		Enjoying time with friends in place	.779
	Factor (2) - 2 items Facilitation social interactions	Sitting area arrangement & Offering eye contact	.968
		Offer gathering	.599
place attachment scale According to PCA, 2 factors explains 86.04%	Factor (1) - 3 items Place dependence	No other campus can compare to that campus	.994
		Wouldn't substitute with any other campus	.904
		The best campus.	.868
	Factor (2) – 3 items Place identity	Attached to	.970
		Very special	.967
		Reflects identity	.786

Also, validity for USM and negative feelings scale had been proven, as the factor loading for the 5 items of USM ranged from .690 to .823, While the factor loading for the 6 items of negative feelings scale ranged from .538 to .950, i.e ≥ 0.5. As for the three items that aimed to measure the use level of the outdoor spaces, their factor loading proved also the validity of measuring the usage level of outdoor spaces.

3.2.2. Reliability

Depending on the reliability rule mentioned in Nunnally's study in 1994, when the Cronbach's alpha (α) test has values over .70 it confirms high internal consistency between items and good reliability [15]. While the criteria of Landis and Koch's study in 1977, which Ronghua Wang's adopted in his study in 2021, pointed to a perfect value of reliability when Cronbach's alpha value is 0.8 or more [31]. According to **Table 4,** all Cronbach's alpha value (α)> 0.8, which means all scales show perfect internal consistency between their items i.e. perfect reliability.

Table 4, Scales'reliability

Scale/Subscale		Cronbach's Alpha	No. of Items
Urban Socialscape Scale (USS) overall		.969	38
Subscales	Physical needs scale	.948	18
	Restorative needs scale	.959	9
	Social needs scale	.908	5
	Place attachment scale	.922	6
USM (Urban Socialscape Map)		.822	5
Negative feelings scale		.826	6
Usage level of outdoor spaces (duration + frequency + activities)		.833	3

3.3. Descriptive statistics

According to **Fig. 4** the simple bar chart (using mode values) shows that outdoor spaces for faculty of engineering for girls gained the lowest satisfaction level in achieving all needs. While faculty of pharmacy for boys gained the highest satisfaction level in achieving all needs.

According to the Histogram graph for the negative feelings score (range from 6 to 30), shown in **Fig 5,** the data skewed to the right for the faculty of engineering for girls (a) i.e. the score of negative feelings biased toward a high level. While the data skewed to the left for the faculty of pharmacy for boys (d) i.e. the score of negative feelings biased toward a low level of negative

feeling, although students there were having exams in such period. Such results predict a negative relationship between achieving needs level and negative feelings. In other words, when level of achieving needs increases from the urban landscape, level of negative feelings decreases.

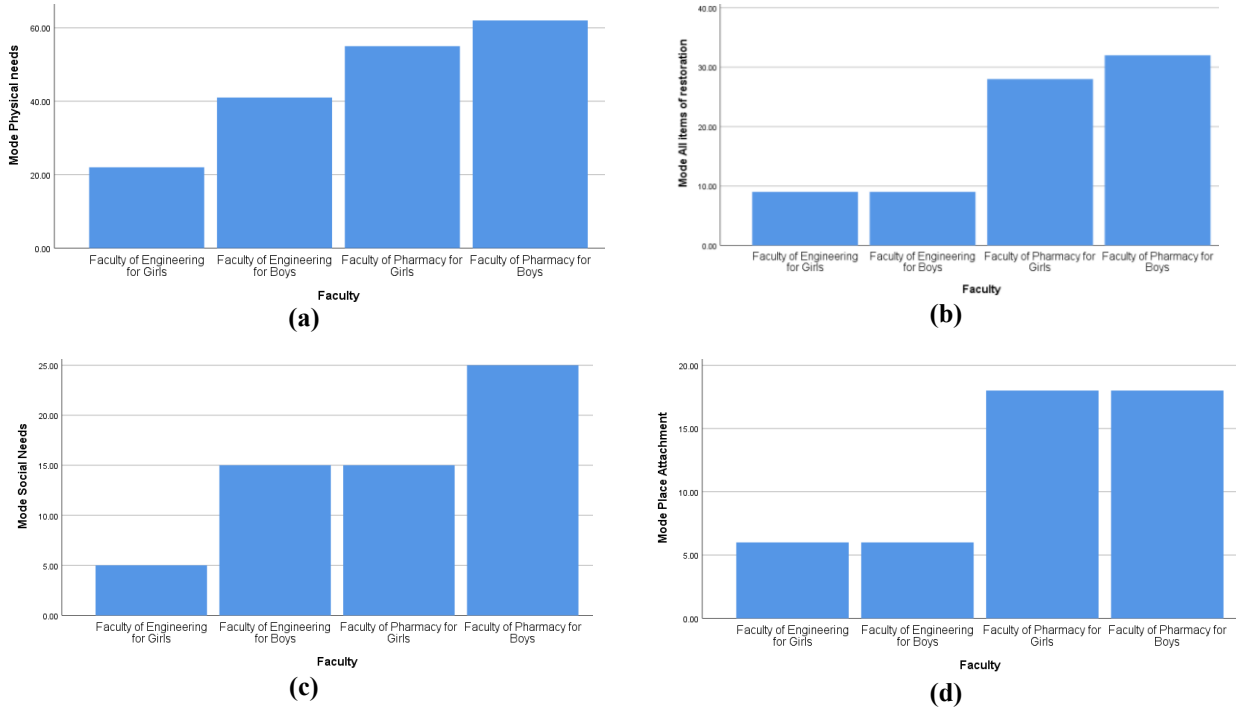

Fig. 4. The simple bar chart (using mode values) for the level of achieving needs (USS's sub-scales score) for all cases. (a) physical needs scale' score range from 18 to 90. (b) Restorative needs scale' score range from 9 to 45. (c) social needs scale' score range from 5 to 25. (d) place attachment scale' score range from 6 to 30

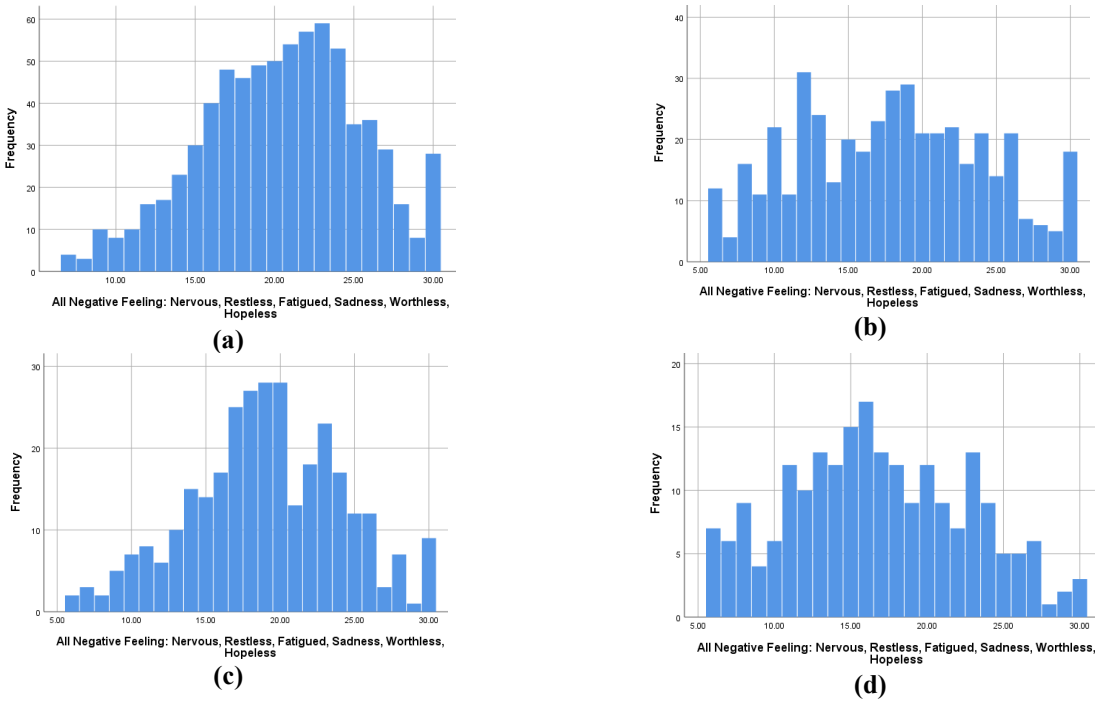

Fig. 5 Histogram describes negative feelings level distribution for all cases (score from 6 to 30). (a) Faculty of engineering for girls. (b) Faculty of engineering for boys. (c) Faculty of pharmacy for girls. (d) Faculty of pharmacy for boys

As shown in **Fig. 6**, the bar chart (using Mode value) for usage score, shows that the faculty of engineering for girls recorded the lowest level of use, in line with field observation results (point 3.1.2). While **Fig. 7** shows, that the USM score (availability of places that achieve the five needs: physical, psychological, mental, social, and place attachment) is zero for faculty of engineering for girls. Such value can explain that most students in the faculty of engineering for girls can not find places to achieve their needs.

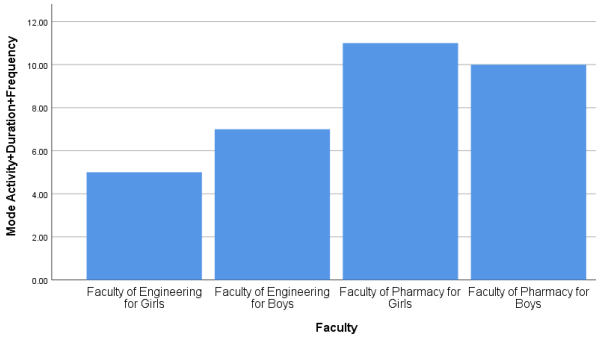

Fig.6 The usage level's score ranges from 3 to 15

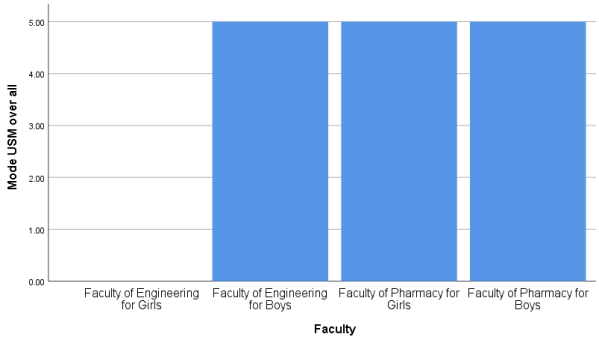

Fig.7 The USM's score ranges from 0 to 5

3.4. Test of relationship (Simple linear regression model):

Regression analysis is one of the statistical methods used to measure the association degree between variables [54]. There are assumptions that should be checked before such analysis which are; linearity and checking enough correlation between variables [54]. A general rule, if the correlation Coefficient, around ±.5 it is a strong relationship, if around ±.3 it is a medium relationship, while if around ±.1 it is a weak relationship [54]. If the relationship is significant, the variable impact should be considered even if it has a small effect (around ±.1) [47]. In this study, the preliminary analyses (linearity test, correlation) took place to prove the ability to perform linear regression.

3.4.1. Model 1, Negative feelings (dependent) and Physical needs (independent):

According to **Table 5**, R (correlation coefficient)=.324 which means the relationship between the physical needs scale and negative feelings has a medium effect. While R square (coefficient of determination)=.105 i.e. 10.5% which means that the level of physical needs achievement is responsible for 10.5% of change happening in the level of negative feelings. In other words, 10.5% of the variation in y (negative feelings) is explained by x (the achievement level of the physical needs required from the outdoor spaces on campus).

Table 5. Model Summary[b] (Negative feelings & Physical needs)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.324[a]	.105	.105	5.34592

a. Predictors: (Constant), Physical needs and b. Dependent Variable: All Negative Feelings

According to **Table 6**, the regression equation, the direction of the relationship (+ or -), and the model significance (if sig. level < .05, i.e. the model is significant) were determined. Accordingly, the model is significant, the relationship is negative (i.e change happens in the opposite direction), while the regression equation (see Equations 1) is:

$$y \text{ (negative feelings)} = 23.903 - .111x \text{ (physical needs)} \quad \text{Eq. (1)}$$

Also, **Table 6** shows Standardized Coefficients Beta = -.324, which means if X (physical needs) changes 1 unit (SD, standard deviation) in turn y (negative feeling) will change with .324 unit (SD) in opposite direction.

Table 6. Coefficients[a] table (Negative feelings & Physical needs)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	23.903	.370		64.518	.000
	Physical needs	-.111	.008	-.324	-14.102	.000

a. Dependent Variable: All Negative Feelings: Nervous, Restless, Fatigued, Sadness, Worthless, Hopeless

3.4.2. Model 2, Negative feelings (dependent) and Restoration (independent):

The value of R=.235 as shown in **Table 7** means that the relationship between restoration needs achievement and negative feelings has a medium effect. While R Square=.055 i.e. 5.5%, which means that the level of restoration achievement is responsible for 5.5% of the change that happens in the level of the negative feelings.

Table 7. Model Summary[b] (Negative feelings & Restoration)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
2	.235[a]	.055	.055	5.49357

a. Predictors: (Constant), restoration' items and b. Dependent Variable: All Negative Feelings

As shown in **Table 8** the (-) sign indicates that there is a negative relationship between negative feelings and restoration needs. The Standardized Coefficients Beta value = -.235, which means that if X (restoration need) changes 1 unit (SD, standard deviation) in turn y (negative feelings) will change with.235 unit (SD) in the other direction. Also, according to **Table 8**, the regression equation (see Equations 2) is:

$$y \text{ (negative feelings)} = 23.903 - .127x \text{ (restoration level)} \quad \text{Eq. (2)}$$

Table 8. Coefficients[a] (Negative feelings & Restoration)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
2	(Constant)	22.119	.340		65.026	.000
	All items of restoration	-.127	.013	-.235	-9.935	.000

a. Dependent Variable: All Negative Feeling: Nervous, Restless, Fatigued, Sadness, Worthless, Hopeless

3.4.3. Model 3, Negative feelings (dependent) and Social needs (independent):

According to **Table 9**, the R = .270 confirms that the relationship between social achievement and negative feelings is a medium relationship. While R Square = .073 i.e. 7.3% refers that the level of social needs achievement is responsible for 7.3% of the change that happens in the level of the negative feelings.

Table 9. Model Summary[b] (Negative feelings & Social needs)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
3	.270[a]	.073	.073	5.44123

a. Predictors: (Constant), Social Needs and b. Dependent Variable: All Negative Feelings

As shown in **Table 10**, Standardized Coefficients Beta = -.270, which means that if social needs achievement changes 1 unit (SD, standard deviation), negative feelings will change with .270 unit (SD) in other direction, because the relationship is negative. In addition, **Table 10** confirms the relationship significance (sig. level< .05), and is used to form the regression equation (Equations 3) which is:

y (negative feelings) = 22.844-.277x (social needs) Eq. (3)

Table 10. Coefficients[a] (Negative feelings & Social needs)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
3	(Constant)	22.887	.361		63.423	.000
	Social Needs	-.277	.024	-.270	-11.545	.000

a. Dependent Variable: All Negative Feelings: Nervous, Restless, Fatigued, Sadness, Worthless, Hopeless

3.4.4. Model 4, Negative feelings (dependent) and Place attachment (independent):

As shown in **Table 11**, the R = .296 confirms that the relationship between place attachment and negative feelings has a medium effect. While R Square=.088 i.e. 8.8%, which means that the level of place attachment is responsible for 8.8% of change that happens in the level of negative feelings.

Table 11. Model Summary[b] (Negative feelings & Place Attachment)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
4	.296a	.088	.087	5.39804

a. Predictors: (Constant), Place Attachment and b. Dependent Variable: All Negative Feelings

Table 12 shows Standardized Coefficients Beta= -.296, which means if X (place attachment) changes 1 unit (SD, standard deviation) in turn y (negative feelings) will change with .296 unit (SD) in other direction, i.e. there is a negative relationship between them. Also, **Table 12** confirmed the relationship significance (as the sig. level < .05), and is used to form the regression equation (see Equations 4) which is:

y (negative feelings) = 22.581-.250x (Place Attachment) Eq. (4)

Table 12. Coefficients[a] (Negative feelings & Place Attachment)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
4	(Constant)	22.581	.309		73.018	.000
	Place Attachment	-.250	.020	-.296	-12.750	.000

a. Dependent Variable: All Negative Feelings: Nervous, Restless, Fatigued, Sadness, Worthless, Hopeless

According to the results above, the relationship between negative feelings and the Urban SocialScape Sub-Scales (needs related to outdoor spaces on campus) have been concluded with percentages in **Fig 8**. Achieving physical needs has the most effective impact on negative feelings. Not surprising that place attachment came in second place as half of it (place dependence) depends on the physical needs achievement. While achieving social needs came in third place, and restoration needs (mental and psychological) took fourth place.

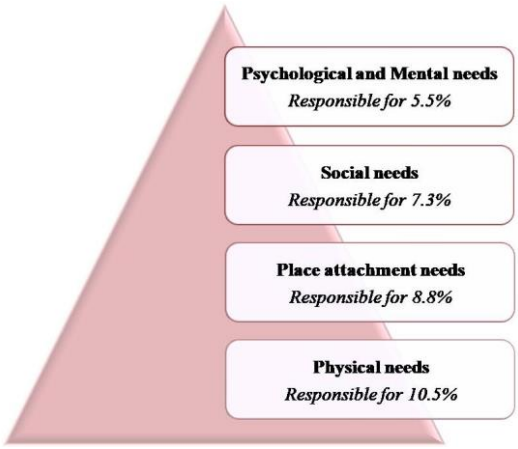

Fig 8. The impact of achieving needs from outdoor spaces on campus on negative feelings.

3.5. Correlation between physical needs items and negative feelings:

According to **Fig 8** achieving physical needs has the greatest impact on negative feelings (responsible for 10.5%). So, this point seeks to find the correlation between each item of the physical needs scale and negative feelings to arrange them according to their influence. After performing the preliminary analyses (linearity and normality test) of correlation analysis, it took place using the Spearman Correlation Coefficient. According to factor analysis (Aforementioned in point 5.2.2), the physical needs scale is divided into four factors (elements, movement qualities, senses qualities, and activities). As shown in **Tables 13,14,15** the relationship between the physical needs scale items and negative feelings is significant (sig. level < .05 for all items).

Table 13. Correlation between Elements (F1) and negative feelings

		Green areas	Vehicles parking and roads	Pedestrian Paths	Sitting areas	Gates and fences'	Services & Amenity	Spaces Quality and Functionality
Negative Feelings	Correlation Coefficient	-.232**	-.201**	-.227**	-.203**	-.232**	-.203**	-.274**
	Sig.	.000	.000	.000	.000	.000	.000	.000

**. Correlation is significant at the 0.01 level (2-tailed).

Elements (F1): According to **Table 13**, achieving space quality and functionality is the most influential element on negative feelings while vehicle parking and road are the least. According to the R-value (correlation coefficient), there is a significant, negative, and medium relationship between elements and negative feelings. In other words, when the level of achieving elements increases, the negative feelings level will decrease. Arranging elements according to their importance will be as follows; space quality & functionality, green areas, gates and fences, pedestrian paths, sitting areas, services & amenities, and vehicle parking and roads.

Movement quality (F2): According to **Table 14**, achieving accessibility is the most influential item on negative feelings, then walkability comes next while offering independence is the lowest. The R-value shows that there is a significant, and negative relationship between movement quality items and the existence of negative feelings. The relationship is medium toward accessibility and walkability. While relationship is weak toward offering independence, however, it should not be neglected as long the relationship has a significant impact.

Sensory quality (F3): According to **Table 14**, achieving feeling quality (feeling of comfort) is the most influential item on negative feelings, while sound quality (sound comfort) is the least. The R-value refers that there is a significant, negative, and medium relationship between senses quality items and existence of negative feelings. Arranging items according to their importance will be as follows; feeling quality, air quality, imagebility, visual quality, and sound quality.

Table 14. Correlation between qualitiesand negative feelings

		Movement quality **(F2)**			Sensory Quality **(F3)**				
		Walkability	Offering Independence	Accessibility	Imagebility	Air quality	Sound quality	Visual quality	Feeling quality
All Negative Feelings	Correlation Coefficient	-.213**	-.180**	-.217**	-.261**	-.275**	-.244**	-.252**	-.295**
	Sig.	.000	.000	.000	.000	.000	.000	.000	.000

**. Correlation is significant at the 0.01 level (2-tailed).

Activities (F4): According to **Table 15**, having a place suitable for social activities such as gathering is the most influential item on negative feelings while having a place suitable for recreational activities such as playgrounds is the lowest. The R-value shows that there is a significant, and negative relationship between activities' items and the existence of negative feelings. The relationship is medium toward activities that require quiet places (taking a break) and social activities (gathering). While it is a weak relationship toward recreational activities (playgrounds), however, it should not be neglected as long the relationship has a significant impact. Arranging items according to their importance will be as follows; having a place for social activities such as gatherings, having a place for activities that require quiet places such as taking a break, and then having a place for recreational activities.

Table 15. Correlation between activities (F4) type and negative feelings

		Activity (1) required Quite place (such as taking break)	Activity (2) required Social place (such as gathering)	Activity (3) required Recreational Place (such as playing)
All Negative Feeling	Correlation Coefficient	-.209**	-.219**	-.178**
	Sig.	.000	.000	.000

** Correlation is significant at the 0.01 level (2-tailed).

Among the selected cases, the faculty of Phramacy for boys is considered partly a successful example as students there were fairly satisfied with their outdoor spaces. Their satisfaction with the needs achievement from the outdoor spaces reflects the level of their negative feeling. Students in faculty of pharmacy for boys recorded the lowest level of negative feelings although they were having exams at the same time of the questionnaire. It is worth mentioning that the site of the pharmacy for boys contains a good front yard with green spaces that enable students to sit on the grass alone or in groups. While the backyard had sitting areas surrounded by some flower boxes and greenery features. However, as reported more services are needed such as accessible playgrounds. The faculty of engineering for boys is considered an unsuccessful case because students were not satisfied with the outdoor spaces surrounding their academic building. The outdoor spaces there have some problems such as the big distance from the cafeteria, and lack of sitting, shaded areas, and green spaces that students can use. However, students of the faculty of engineering for boys can use any other outdoor spaces on the campus. According to the results students there suffered from negative feelings more than students in the faculty of pharmacy for boys although they were not having exams at the same time of the questionnaire.

As for the faculty of pharmacy for girls' outdoor spaces, they partially satisfies students' needs but they have some problems. For example, the front approach is very narrow, which makes it crowded most of the time because students prefer to sit there. Also, the front approach is located very close to the main entrance of girls' campus which makes the main flow of car movement pass in front of it. Such close location affects air and sound quality. It is worth mentioning that students were having exams at the same time of questionnaire which may affect their feelings negatively. The faculty of engineering for girls is considered the most unsuccessful case because students were not satisfied at all with their outdoor spaces. Such very low satisfaction reflected the level of their negative feeling. Students there recorded the highest level of suffering from negative feelings although they were not having exams at the same time of the questionnaire. The faculty of engineering for girls' site does not meet the basic needs such as a cafeteria, enough seats, and qualified greenery features although the outdoor space around is big. It is worth noting that the

faculty of engineering for girls is surrounded by a fence to be separate from the boys' campus and located away from the girls' campus. In other words, the outdoor spaces surrounding the faculty's building are considered the whole campus for the students. Accordingly, such spaces should meet all their needs.

In the context of paying attention to the students' psychological health and feelings, the faculty of engineering for girls led by the dean set a plan to develop the outdoor spaces around the faculty. The development plan aimed to meet students' needs from the urban landscape in the long run. The plan was started months ago and is still in progress. As a first step, green spaces, trees, and seats were established to create a desirable environment able to make students cope with the stress they face, as shown in **Fig 9**.

Fig. 9 part of the developing process, photos taken on 24-10-2023.

SUMMARY AND CONCLUSIONS

Following a triangulation methodology represented in the literature review, field observation, and questionnaire, enabled authors to confirm the deep relationship between the level of achieving needs and negative feelings. The proposed "Urban Socialscape Scale – USS" was confirmed to be a valid and reliable scale to measure students' needs on campus. It consisted of 4 subscales depending on the five principles of the Urban Socialscape Framework. The subscales are physical needs scale, restoration needs scale (mental and psychological needs), social needs scale, and place attachment scale. The significant, medium, and negative relationship between the level of negative feelings and the level of achieving needs has been assisted statistically. In other words, when the outdoor spaces achieve the physical needs, mental needs, psychological needs, social needs, and place attachment in turn negative feelings (nervous, restless, fatigued, sadness, worthless, hopeless) will be reduced. Accordingly, the study's hypothesis was confirmed, as lack of needs achievement on outdoor spaces proven to be partially responsible for negative feelings.

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