

A Conceptual Framework for Campus Green Spaces Supporting University Students' Socio-Emotional Well-Being

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1 Student Questionnaire

The first page of the survey provided an overview of the study which had three short introductory paragraphs outlining the definitions of campus outdoor green spaces, student stress, and the project goals:

1) Why this survey? University life is a transition period, many university students face significant challenges, including current and new relationships, lifestyle change, new environment, academic performance and financial pressures, unknown future outlook, and others. Studies have shown that stress has the strongest effects on the quality of life in university students. Students experiencing stress can suffer emotionally, socially, and physically as a result of campus life.

This survey will gather information on student stress in order to create better outdoor spaces to help with stress relief. Through good management of stress, student well-being can be improved, thus enhance their quality of life, and get through this transition period.

2) Stress for a university student. Stress is an individual's response to change in circumstance or to a threatening situation. It can be viewed as a personal reaction to an external event or demand and tends to increase with the prospect of not being able to cope with the situation at hand.

For this study, we want to know what types of outdoor spaces can perhaps help students feel less stress. This survey is anonymous and should take no longer than 5 minutes to complete. Thank you.

Per literature, the study asked respondents to consider these feelings in answering the questions about their stress: 1) Feel something is out of control in your life; 2) feel nervous, upset, depressed, or angry about something that happens unexpectedly; 3) have doubts about your personal abilities; 4) feel difficulties are piling up so high that you could not overcome them; and 5) can't control your mood swings or your temper.

1.1 Question 1: What Are the Main Feelings Related to Your Stress When You Are on Campus?

Supplementary Table 1: Summary of choice and responses for Question 1

Response choice	Ratio
Feel nervous about social activities or interacting with strangers	10%
Lack of close friends, family support, and feel lonely	15%
Worried that you are not accepted or liked by others	12%
Too high expectation of academic performance	19%
Concern about the unknown future or future achievement	25%
Worry about if you can't cope with everything you have to do	19%

The next two questions asked students to identify the most and least stressful time periods during the semester.

1.2 Question 2: Semester Stress—Most Stressful Periods

During the semester, there are different periods and weeks which change how you feel and how much stress you have. In the question below, please select your three most stressful time periods during the semester. Consider how you feel during the different periods of a semester as listed below: 1) feel something is out of control in your life; 2) feel nervous, upset, depressed, or angry about something that happens unexpectedly; 3) have doubts about your personal abilities; 4) feel difficulties are piling up so high that you could not overcome them; 5) can't control your mood swings or your temper.

Supplementary Table 2: Summary of choice and responses for Question 2

Response choice	Ratio
Weeks 1–2: Beginning of a semester, new courses, start adapting to school life	17%
Weeks 3–5: Early-stage, get used to school life, moderate academic pace	4%
Weeks 6–7: Mid-term, mid-term examinations and assignments	22%
Study break: No class, deadlines of assignment after the break	4%
One week after the study break: Finish a round of assignments, a relatively long period of time before the end of the semester	9%
Weeks 11–12: Before the final, face the upcoming final exams and assignments	20%
Weeks 13–14: The completion of all courses, take the final exams, submit all assignments	24%

1.3 Question 3: Semester Stress—Least Stressful Periods

During the semester, there are different periods and weeks which change how you feel and how much stress you have. In the question below, please select your three least stressful time periods during the semester.

Supplementary Table 3: Summary of choice and responses for Question 3

Response choice	Ratio
Weeks 1–2: Beginning of a semester, new courses, start adapting to school life	19%

Weeks 3–5: Early-stage, get used to school life, moderate academic pace	22%
Weeks 6–7: Mid-term, mid-term examinations and assignments	9%
Study break: No class, deadlines of assignment after the break	28%
One week after the study break: finish a round of assignments, a relatively long period of time before the end of the semester	10%
Weeks 11–12: Before the final, face the upcoming final exams and assignments	2%
Weeks 13–14: The completion of all courses, take the final exams, submit all assignments	10%

The next five questions asked students to reflect upon their primary feelings related to stress and the existing campus landscape.

1.4 Question 4: Outdoor Space Activities to Relieve Stress

What activities do you do in outdoor spaces do you think will help you relieve stress when you feel stressed on our campus? Select two from the following:

Supplementary Table 4: Summary of choice and responses for Question 4

Response choice	Ratio
Small social activities, such as chatting, eating, and playing games with others.	35%
Large social events, participate in group activities, be with friends, or go to meet new people.	9%
Outdoor physical exercises alone or with others, such as walking, jogging, yoga, etc.	34%
Be alone, stay in a hidden and quiet place to do your own thing.	22%

1.5 Question 5: Outdoor Space Characteristics

If you feel stressed and want to go to an outdoor space, which elements listed below can make you more willing to visit a campus outdoor space to relieve stress and feel relaxed? Select two from the following:

Supplementary Table 5: Summary of choice and responses for Question 5

Response choice	Ratio
Multi-function: flexible function, support different activities	12%
Specific function: single function for specific use purposes	3%
Public: large-scale, open and constructed, complete infrastructure, good lighting, access freely	9%
Private: small-scale, sense of individual domain, less openness, serene and quiet, calm and peaceful	25%
Natural elements: trees, lawns, flowers, water, stone, birds, insects, etc.	31%
Amenities: tables, chairs, benches, shelter, etc.	12%
Climate: light conditions, wind barrier, terrain conditions, etc.	3%
Convenience and accessibility: easy access from the campus buildings, close relationship with the road, etc.	6%

As a note, the response for “Climate” was removed from the result analysis due to the unclear and ambiguous nature of the response statement.

1.6 Question 6: Current Outdoor Spaces on Campus

Which types of outdoor spaces do you think are not enough of on our current campus? Select three from the following.

Supplementary Table 6: Summary of choice and responses for Question 6

Response choice	Ratio
Places to go with friends outside	9%
Green spaces where I can get close to nature	9%
Social outdoor spaces for interacting and holding events	8%
Quiet and private green spaces	14%
Outdoor study spaces	31%
Outdoor spaces for exercise	22%
Campus greenery (e.g., street trees, planting beds, gardens)	6%

1.7 Question 7: Outdoor Space Preference for Relieving Stress

If you want to relieve your stress, which spaces do you want to be created on the campus in the future. Select three from the following:

Supplementary Table 7: Summary of choice and responses for Question 7

Response choice	Ratio
Outdoor social spaces: e.g., outdoor cafe, outdoor theater, outdoor eating space, outdoor stage	23%
Outdoor study spaces: e.g., outdoor classroom, outdoor amphitheatre, study areas	2%
Outdoor horticultural spaces: e.g., campus gardens, arboretum, food produce	5%
Outdoor natural spaces: e.g., campus forest, rain garden, green roof, water elements	15%
Outdoor healing spaces: e.g., zen garden, sensory garden	19%
Outdoor exercise spaces: e.g., running tracks, yoga lawn, hiking, cardio	9%
Outdoor cultural spaces: e.g., campus history, outdoor art, diverse peoples	12%
Outdoor winter use spaces: e.g., skating square, mini-greenhouse, firepit	11%
Ornamental greenery: e.g., street trees, planting bed, lawn areas, bosques	4%

1.8 Question 8: Outdoor Space Typology

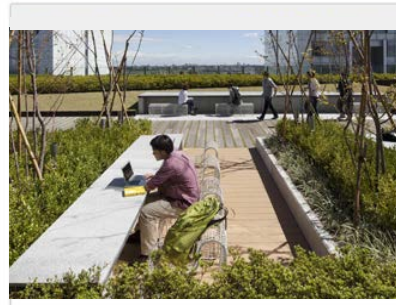
If you want to relieve your stress, which type of outdoor spaces do you prefer to visit?

Supplementary Table 8: Summary of choice and responses for Question 8

Response choice	Ratio
Paved, constructed, active, lively with many benches, tables, and amenities	19%
Natural, plants, wildlife, quiet with few benches, tables, and amenities	81%



A. Constructed, active, lively



B. Natural, plants, wildlife, quiet

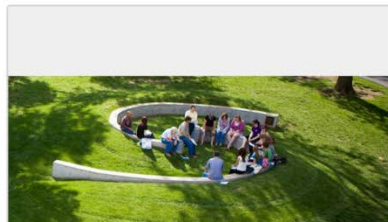
Supplementary Fig. 1 Images to be chosen in Question 8. © Richard LeBrasseur, Kunyuan Chu

1.9 Question 9: Outdoor Space Characteristics

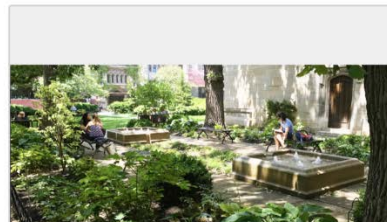
If you want to relieve your stress, which outdoor spaces do you prefer to visit?

Supplementary Table 9: Summary of choice and responses for Question 9

Response choice	Ratio
Physically connected to other spaces, feels public, open with views to other areas	37%
Small, intimate and not physically or visually connected to other spaces, feels enclosed, with few views to other areas	63%



A. Connected, public, open



B. Numerous, intimate, enclosed

Supplementary Fig. 2 Images to be chosen in Question 9. © Richard LeBrasseur, Kunyuan Chu

1.10 Question 10: New Outdoor Campus Spaces

If you could create a new outdoor space to reduce stress during any time in a semester, what would that be?

Supplementary Table 10: Summary of responses for Question 10

Response	Number
A green roof with outdoor seating	3
A space with a lot of sunshine and views to the sky	5

An outdoor skating rink	4
Indoor area with views to greenery all around them	18
Place to view of Salmon River	2
A sunken area with benches and chairs	1
An indoor garden/greenhouse	11
Outdoor theater	4
Retention pond	2
Add artwork	5
Outdoor cafe	12
Yoga or meditation space	3