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USP 125

17 March 2024

Balconies: The Impact of Non-traditional Green Spaces on Students

Abstract

The purpose of this project was to determine the ways students use non-traditional green spaces and why. We investigated the 5th Floor Balcony at 6th College at UCSD as it met the requirements of a non-traditional space - a green space that is not at ground level (Speake et al. 22). We focused on non-traditional green spaces since recent changes to the university's buildings have replaced traditional green spaces, making non-traditional spaces increasingly important. Kaito investigated how frequently students use the balcony and why, Riya determined whether time of day affected the activity type and population at this space, and Jennifer determined how the non-traditional layout impacted the students' favorability. We utilized convergent mixed methods and interviewed students on two consecutive days at 11:00am and 3:30pm using a Google Forms survey with predetermined questions. We determined that ocean view is an important factor as to why students use the space and what furniture they use. It was difficult to determine if the time of day affects the population, however, there seemed to be a slight correlation between the day of the week and the activity type. In conclusion, the unique characteristics of this non-traditional space attract students.

Introduction

In the heart of urban landscapes, green spaces offer a reprieve by not only breathing life into concrete jungles, but also benefiting the environment and people's well-being. Incorporating green spaces mitigate the high levels of stress present in large cities and combat the negative aspects of "rapid urbanization" (Kasim et al. 103). Specifically in college campuses the implementation of greenspaces has been beneficial and is considered to be important for the image of the university and as an essential component of the campus environment (Speake et al. 21). In addition, studies show that green spaces have positive effects on students as they help mitigate stress (Foellmer et al. 1). Students who interact with outdoor spaces - especially green spaces - often report that their quality of life is generally higher (Holt et al. 424). All in all, the research demonstrates the significance of green spaces.

This team aimed to answer the following question: In what ways do students use non-traditional green spaces on campus and why? Speake et al. defines open space and an open outdoor space with vegetation (22). The team decided to use this definition to define non-traditional space as a green space that is not on the ground level and is attached to a building. The specific question I investigated is "How does the time of day affect the activity type and population on the balcony?" Since there is a limited amount of space on college campuses, non-traditional spaces are becoming more prevalent due to increased building constructions on open spaces. Investigating non-traditional greenspaces are essential for a comprehensive understanding of its impact on human well-being, specifically that of college students. Because of the high level of stress experienced by college students, it is important to explore the relationship students have with existing green space to determine ways it can be

enhanced. Exploring these dynamics helps create innovative approaches to urban development that prioritize the well-being of college students. Considering the impact of green space on students, this team wants to observe the impact it has on students in UCSD, particularly the ones who use the 5th floor balcony at Ridge Walk Academic Complex (RWAC). Since this is generally a popular location and closer to central campus, the team felt that this location will help determine how balconies function, specifically on college campuses, which in turn will help them answer our main research question. The available research discusses the importance of green space and how it benefits students, so the team wants to understand in what ways the balcony affects students in terms of usage.
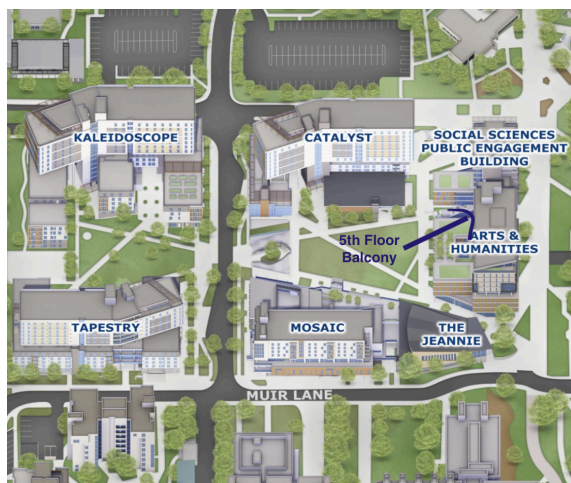

Figure 1 - Location of the 5th Floor Balcony at 6th College at UCSD

Literature Review

Green spaces are essential for fostering the well-being of both individuals and communities and extensive research underscores the myriad of benefits associated with the presence of green spaces in urban environments. While green spaces benefit the health of its users by improving air quality and reducing noise pollution, it also improves the ambiance of the

city. It combats the urban heat island effect and encourages biodiversity (Kasim et al. 112). As urbanization continues to rise, it becomes increasingly difficult to find enough open space to utilize as a green space. An increase in building density leads to a rise in negative attributes of cities, such as noise pollution and stress. Therefore, it is beneficial to incorporate non-traditional spaces - such as balconies - to combat these obstacles. In general, urban areas have vertical space rather than horizontal space, so non-traditional green spaces work best (Kasim et al. 103). In a study conducted by Mladenović et al., most of the participants stated that having access to a balcony with greenery had a positive effect on them. While merely seeing natural green colors benefits viewers and creates a more vibrant atmosphere, having a balcony involves direct interaction with green space, which has more positive effects (Mladenović et al. 43). It is important to understand the needs of the group, such as personal factors like use and opinion about green spaces, to design a space that supports them in the best way possible (Lee et al. 856).

Specifically on college campuses, green spaces have been proven to be incredibly beneficial in reducing stress (Foellmer et al. 1). In addition, students state that the spaces are important for socialization and can reduce feelings of loneliness (Speake et al. 27). Some common activities include using the spaces to walk around to combat stress, having moments of solitude, socializing, etc, which demonstrates the versatility of these areas (Seitz et al. 102). One study suggests for campus health professionals to integrate green spaces into health programs, such as yoga classes during finals week, to incentivize students to spend more of their time in green spaces (Seitz et al. 107). Generally, most students agree that green spaces are integral on campuses in terms of image campus experience (Speake et al. 28-29). An interesting finding of one study determined that students choose universities based on their perception of campus,

which can be positively influenced by the presence of green spaces. This improves the aesthetics of the campus, making it more welcoming for prospective students (Seitz et al. 107).

Methods

A study conducted by Mladenović et al. involves mixed methods - a combination of quantitative research with qualitative research - to demonstrate how densely populated areas do not have much greenery and how balconies opens the opportunity for incorporating plants to increase "overall plant diversity" as well as "positive aesthetic and ecological effects" (Mladenović et al. 38). Based on the success of that study, we decided to follow a similar approach, specifically a convergent mixed methods study, which involves collecting quantitative and qualitative data simultaneously (Creswell & Creswell 544). We switched off who would observe and who would interview but generally we all were present and participating during all four time slots (Thursday 11am, Thursday 3:30pm, Friday 11am, Friday 3:30pm). We took note of the number of students present at each time, as well as what activities they were engaged in and what furniture they were using. We documented this data in a google spreadsheet.

After ensuring that we had the consent of the participants, we asked them what they were doing at the balcony (studying, relaxing, etc.) as well as their opinions about the state of the area. We also asked them about their opinion on green spaces in general to get a better understanding as to why students choose (or do not choose) to interact with green spaces. For these questions, we provided a set number of answers for the participants to choose from and then we saw what the majority and minority choices were. These questions are quantitative data because they were presented in a numerical fashion. In addition to quantitative data, the team also collected qualitative data. We asked students to elaborate more about their opinion of the balcony, as well

as write a sentence or two about their commute frequency to this location. This data gave the team a better understanding of the quantitative data and the reasoning behind each interviewee's response regarding the balcony space.

The time of day can affect how many people choose to venture to the balcony and the reasoning behind it, which was the main part of my investigation. To get a better understanding, we interviewed 16 people in the morning from 11:00am-12:00pm and 16 people in the late afternoon from 3:30pm-4:30pm on two consecutive days to ensure reliability of the data. We chose to interview 16 participants each time because we believed it to be a good sample size and it is enough data to analyze. We had these participants fill out a google form with questions regarding their opinion about the balcony, their favorite features, and what activity they are engaged in. In addition, we included questions that asked participants to elaborate on their opinion about the space to see if there are any common points between the reasoning behind the responses and get a better understanding of the way students interact with the green space. Using the acquired data, the team determined the impact of balconies on students and the common activities of those who use the space.

Results

Over the course of the interviews and observations, the team was able to gather enough data to answer their research question. The team imported the data into a Jupyter Notebook (see appendix) and used python packages to clean and analyze the data using appropriate graphs.
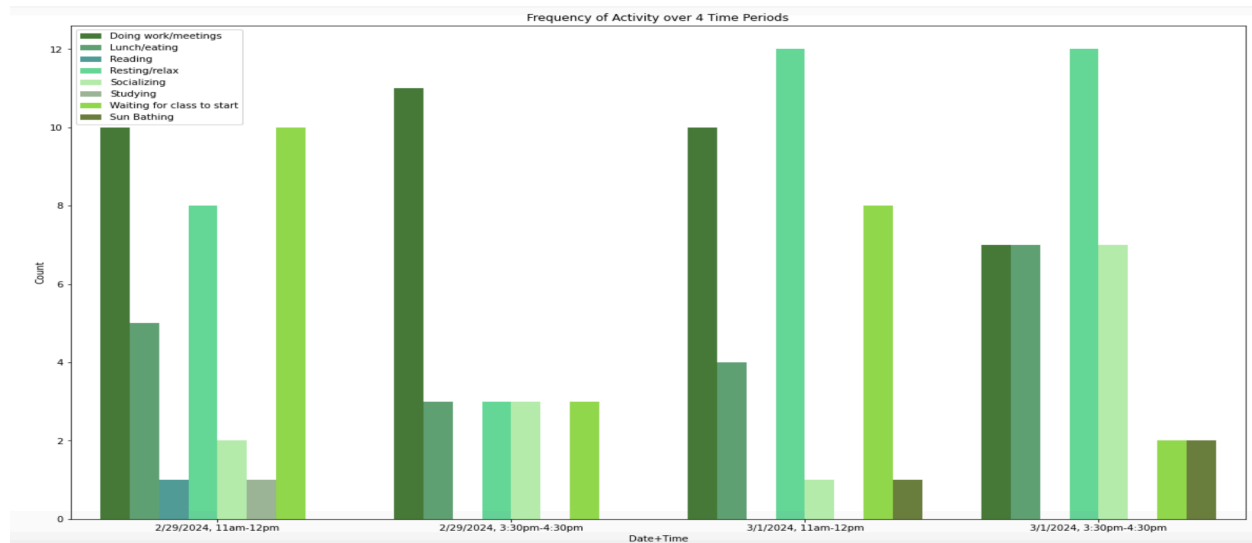
Figure 2. Frequency of Activity over 4 Time Periods

Over the course of the two days and two time periods, the team documented the

frequencies of each activity time. Figure 2 displays the frequency of different activities at

different days and times. The team observed that on Thursday at 11am-12pm, there seemed to be

a tie between "Doing work/meetings" and "waiting for class to start." On the same day at

3:30pm - 4:30pm, the most common activity is doing work/attending online meetings. On Friday

at both times, the most common reported activity is resting and relaxing. Overall, the most

popular activity is doing work/attending meetings virtually. This is not an incredibly surprising

statistic because it is a college campus. In addition, this data was collected during week 8, which

is approaching the busiest part of the quarter. Therefore, most students seek different locations to

complete their work and get a different scenery.

To get a better understanding as to why students choose the 5th Floor Balcony as a

location to perform their different activities, the team asked the participants to identify their

favorite part of the balcony. They were given 3 options to choose from, with the 4th option

allowing them to include another option. The results were then depicted using a bar graph (Figure 3) to show the frequency of each response.
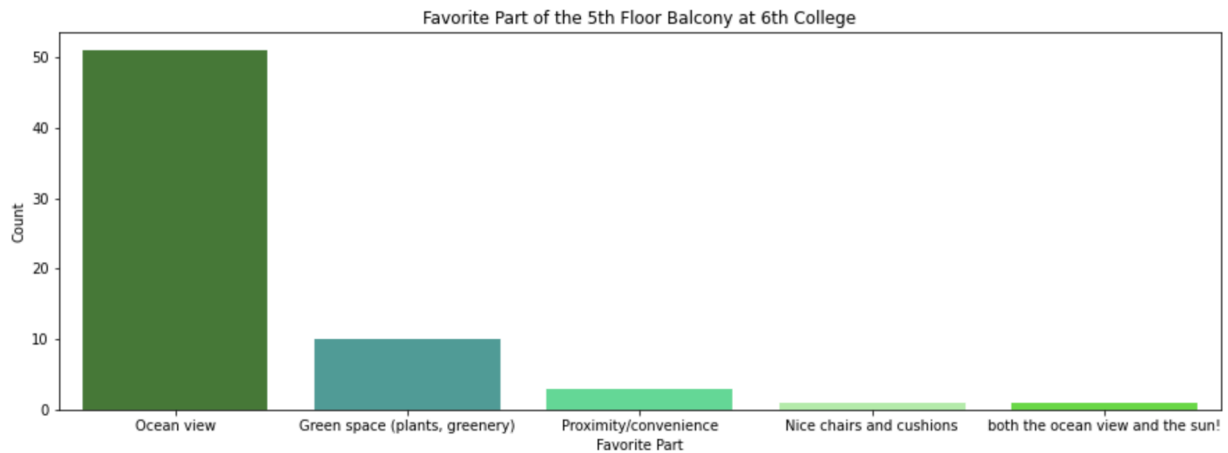
Figure 3: Bar Graph Depicting The Favorite Part of the 5th Floor Balcony at 6th College

As seen in Figure 3, the most common response was "Ocean View". The team inferred that the general ambiance and aesthetics of the balcony is what draws many students to this location. The natural environment can reduce stress levels and create a more relaxed mindset. The calming, visually stimulating nature of an ocean view and refreshing change of scenery can inspire creativity and help students feel motivated.

To determine if certain time periods have a higher student population on the balcony, the team observed and counted the number of students for each of the 4 time periods.

Figure 4: Number of Students at the Balcony at 4 Different Time Periods

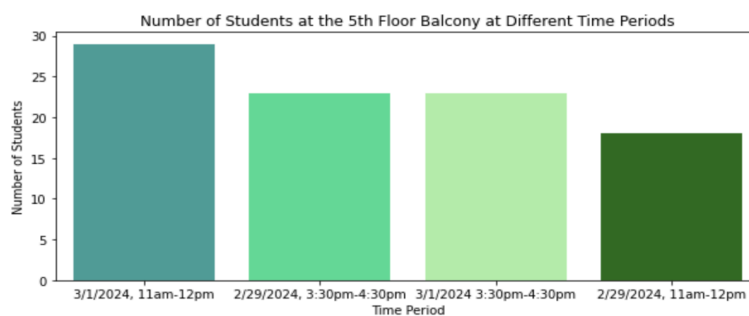According to Figure 4, Friday, 3/1/2024 from 11am-12pm has the highest number of students. Many students might be using the time to finish up their work before the end of the week. Usually, the due dates for projects and tests are on Fridays, therefore students might seek out study areas - such as the balcony - to finish up their work. In addition, there are many classes that occur at RWAC around this time, so students choose to wait at the balcony. Interestingly enough, the total number of students present from 3:30pm-4:30pm on both days was exactly the same.

The team asked the participants to elaborate on their opinion about the balcony space with a short answer. After gathering all the responses, we removed stopwords - insignificant words such as "the" and "of" - as well as punctuation to gather a list of relevant words. These words were then assembled into one large list and the frequency of each word was determined to create a word cloud (see Figure 5), where the more frequent words were written in a larger font. In addition, the team conducted sentiment analysis on the responses regarding the participants' opinion of the balcony, which is the process of determining whether the text has positive or negative emotions behind it.

Figure 5: Word Cloud

Figure 6: Sentiment Analysis

According to Figure 6, there generally seems to be positive sentiment regarding the balcony. As seen in the word cloud in Figure 5, most students describe the area as "nice" and "great" with a good "view" of the "ocean". One common theme between the more negative comments is the lack of outlets available. Because of this obstacle, it makes it difficult for students to stay in the area for a long time because their devices cannot sustain themselves without charge for very long. To further encourage students to use the space, it is important to incorporate more outlets.

Discussion

Based on the analysis conducted in the results section, the team and I were able to gain more insight regarding our overarching question. By counting the total number of students participating in each activity, we determined that the most common answer was "Doing work/meetings." This is due to the fact that UCSD is a busy college campus with great emphasis on academic achievement. To escape the mundane four walls of other study locations, we observed that students seek out this balcony mainly for the ocean view, which creates a calming ambiance.

To further understand the motivations behind students choosing the balcony, the team asked the students to elaborate on their opinion regarding the space. Using the qualitative data, the team worked to determine whether the students had positive or negative views about the balcony. In Figure 6, it is evident that most of the opinions are positive. Students praised the ocean view and generally said the area was "great" and the "greenery" and "plants" were a nice touch. This analysis gave the team insight as to why the space was popular among students. Based on the word cloud and the graph, it seems that the negative reviews are mostly

constructive criticism. One common theme was the lack of outlets, which prevents students from using the space for a long time. When working to improve the balcony, it is important for designers to account for this.

When investigating my specific question regarding time I discovered that the time of day does affect the frequency of the different observed activities. On Thursday at 11am-12pm, "Doing work/meetings" and "waiting for class to start" were the most common activities and at 3:30pm - 4:30pm, the most common activity was doing work/attending online meetings. The tie in the morning could be because it is a popular time for classes, therefore most students choose to wait at the balcony and possibly get some work done before the class. In the afternoons, there are less classes, so students just utilize the space for work-related activities. At both times on Friday, the most common reported activity is resting and relaxing. This might be due to Fridays being towards the end of the week, meaning most people do not have much work to do and take the time to unwind after a long week. While time of day affects the observed activities, there doesn't seem to be a strong, definite correlation between time period and population. Friday at 11am-12pm has the highest population, and Thursday at the same time, the population is the lowest. An unexpected observation is the fact that for both days at 3:30pm-4:30pm, the number of students present is the same. It is possible that this is the average number of students that choose to utilize the balcony at this time. However, there is not enough data to validate any of these speculations. The trend might be more clear if the team collected data from more time periods and observed the statistics.

Conclusion

Through extensive data collection, the team was able to answer their overarching question and determine what type of activities students engage in at the 5th floor balcony at RWAC. In addition, we were able to determine the reasoning behind their choice of location using a questionnaire that allowed participants to document their favorite part of the balcony, as well as a written response for their opinion about the space. Using the data gathered from the questionnaire and thorough analysis using python packages and natural language processing, the team was able to determine the positive and negative aspects of the balcony. Generally, students praised the ocean view and greenery surrounding them. However, a common criticism was the lack of outlets available for studying. It is important for developers to heed these comments made by the participants to further improve the space. In addition, I was able to gain more insight regarding my specific question about whether time and day affects the activities students engage in as well as population. As demonstrated by the data, activity type can vary based on the day and time, but it is unclear whether population at a given time can be determined. Therefore, it is necessary for additional research to be conducted to reach a stronger conclusion. In summary, green spaces are essential in today's world, and the more we strive to maintain and understand these spaces, the better it will be for society and college students!

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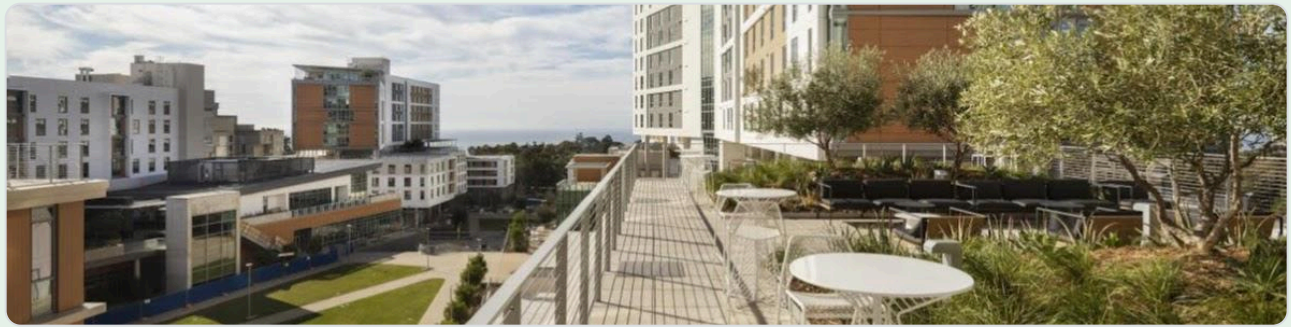
Sixth College (RWAC) Balcony Survey

We are conducting a research project about the way green spaces are used on campus. Your participation is voluntary and we would appreciate it if you took a few minutes to fill out this short survey! Thank you!

rmhatre@ucsd.edu Switch account

Not shared

* Indicates required question

What is your major? *

Your answer

What year are you? *

○ Freshman

○ Sophomore

○ Junior

○ Senior

○ 5th Year+

What are you using this space today for? (Select all that apply) *

☐ Waiting for class to start

☐ Doing work/meetings

☐ Resting/relax

☐ Lunch/eating

☐ Socializing

☐ Other:

Is this your preferred place on campus? If not, what place do you usually go to? *

○ Yes

◉ Other:

How would you describe this area? *

○ Adequate area

○ Could use improvement

○ Provides what it needs to

Please elaborate on why you chose your previous answer. I.e. If you think it needs *
improvement what could be improved or what about the space works/doesn't
work.

Your answer

What is your favorite part about the terrace? *

- ◯ Green space (plants, greenery)
- ◯ Proximity/convenience
- ◯ Ocean view
- ◯ Other: _____

How important is green space on campus to you? (Green space is defined as any * **outdoor areas that "contain a significant amount of vegetation" & "provides aesthetic environments for recreation and leisure")**

- ◯ Very Important
- ◯ Important
- ◯ Somewhat Important
- ◯ Not Important

How far did you travel to get here? How frequently do you come here? *

Your answer

Submit   Clear form

Group: Sixth College		
Location: RWAC 5th Floor Balcony		
Date: Thursday, 2/29/24 11 AM - 12 PM		
Weather Conditions: Cloudy, Cold		
Direct Observations:	**# of Students**	**Notes**
Resting	1	Sleeping on the chair
Socializing in place	4	
Students sitting alone	5	2 overlap with screentime
Relaxing/View watching	0	
Eating	3	
Screentime	6	1 of them was talking on the phone
Other Activity	0	
Reading	1	
Eating+Screentime	2	
Type of Furniture Used		
chairs near balcony	8	
big tables	2	
white tables	7	
stand alone chairs	1	
Total Students: 18		

Group: Sixth College		
Location: RWAC 5th Floor Balcony		
Date:Thursday, 2/29/24 3:30 PM - 4:30 PM		
Weather Conditions: Sunny, Cold		
Direct Observations:	**# of Students**	**Notes**
Resting	0	
Socializing in place	2,2,2,2,2,2	Total: 12 Students; There were instances where people were socializing and then one person leaves, so the other one just stays and does an activity. There was also a case where someone was waiting for someone else.
Students sitting alone	5	
Relaxing/View watching	2	
Eating	4	One person was eating but not a student and another student was socializing but could not open the form
Screentime	5	
Other Activity	1	Taking a midterm
Reading	1	
Eating+Screentime	0	
Type of Furniture Used		
chairs near balcony	5	
big tables	3	
white tables	13	
stand alone chairs	2	
Total Students: 23		

Group: Sixth College		
Location: RWAC 5th Floor Balcony		
Date: Friday, 3/1/24 11 AM - 12 PM		
Weather Conditions: Sunny, Cold, Windy		
Direct Observations:	**# of Students**	**Notes**
Resting	1	Sleeping on the chair
Socializing in place	2,2	Total: 4 students
Students sitting alone	8	
Relaxing/View watching	1	
Eating	2	
Screentime	12	
Other Activity	1	2 students were on the phone, 1 was on zoom
Reading	2	
Eating+Screentime	1	
Type of Furniture Used		
chairs near balcony	13	
big tables	7	
white tables	8	
stand alone chairs	1	
Total Students: 29		

Group: Sixth College		
Location: RWAC 5th Floor Balcony		
Date:Friday, 3/1/24 3:30 PM - 4:30 PM		
Weather Conditions: Sunny, Warm		
Direct Observations:	**# of Students**	**Notes**
Resting		
Socializing in place	2,2,2,2,2,2,3,2	17
Students sitting alone	9	
Relaxing/View watching	1	
Eating	3	One staff not student
Screentime	17	
Other Activity	1	playing a game
Reading		
Eating+Screentime		
Type of Furniture Used		
chairs near balcony	9	
big tables	5	
white tables	8	
stand alone chairs	1	
Total Students: 23		