

OUTDOORS AND ACTIVE: A Look into UBC's Greenspaces

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Executive Summary

In this report, we explore the rates of usage and awareness of outdoor spaces across the UBC campus. The goal of this study was to understand the current levels of awareness/usage, barriers that keep people from using outdoor spaces, or facilitators that encourage them to use these spaces. The research focused on three different types of spaces, defined by UBC Recreation, which are built spaces, natural spaces, and cultivated spaces. The target population for the study included all members of the UBC community who currently study, live, and/or work at UBC. The mixed-methods surveys were distributed through social media, physical posters, or person-to-person interactions. After a response period that lasted between March 18th - April 3rd, 87 responses were gathered, and some key findings were discovered. Awareness of all 3 types of spaces was relatively high overall; every space we had in the survey had an awareness level of >50%. The usage rates were much higher in the natural spaces overall, both built and cultivated outdoor spaces lagged behind. Some key things noticed about these usage rates were that outside of the natural spaces, usage was often only high in areas that were considered central to campus (i.e., MacInnes Field and the Rose Garden). Based on the qualitative feedback that was received, there were some common barriers that people identified that kept them from using these spaces. One of these barriers was the issue of overcrowding. For example, a super crowded MacInnes field on a summer day doesn't have a lot of space for people to play sports like soccer and frisbee. Another issue that people mentioned often was the issue of safety, in particular for trails like the one in Pacific Spirit Park. Some people reported they didn't feel safe walking through areas like this due to a combination of a lack of proper lighting or a fear of walking alone. The social aspect of this was also a common theme in all other areas, many people reported not using the spaces as often because they don't have a group of friends to go to them with, which discourages their participation. Finally, another barrier mentioned often was the weather in Vancouver. A lot of places, like the skatepark and basketball courts, are unsafe to play on during rainy weather, so as it rains for the majority of the year in Vancouver (especially in the months where students are at school), it makes these spaces harder to use. Some recommendations that we have come up with through doing this report include the following. An example of a recommendation we had was to organize social groups for walks/hikes around the natural and cultivated environments, as that would eliminate the barrier of feeling unsafe for people, and could encourage other members who felt isolated to utilize these spaces. Coverings for some outdoor spaces like the tennis courts, basketball courts, and skatepark could also be a way to increase utilization year-round so that it is not fully weather dependent. A final longer-term recommendation would be to create an app that could organize all of the spaces together and display the times when these spaces are available to use for the public (and whether or not they are free). If these recommendations are implemented, we think it will further ingrain physical activity into the UBC culture.

Introduction

Within the expansive grounds of the University of British Columbia (UBC) campus, there are a wealth of opportunities to be physically active. The campus offers a rich array of outdoor spaces, including McInnes Field, Pacific Spirit Park trails, Wreck Beach stairs, and cultivated areas like the Botanical Gardens and Nitobe Garden. Basketball courts, situated near the Hebb building, next to the skatepark, and by each first-year residence, along with dispersed tennis courts, further augment the campus' recreational outdoor landscape. These areas hold immense potential for physical activity, yet awareness and utilization rates of these spaces by the UBC community remain unknown. This report aims to explore the untapped possibilities within these outdoor spaces, investigating their awareness, usage rates, and potential to enhance the physical activity and mental health levels of the UBC community, including students, faculty, and staff who study, live, or work at UBC. Through open-ended questions and community feedback analysis, we seek to understand the current scenario and propose strategies to boost engagement.

Literature Review

A study done by Puhakka (2021) studied university students' participation in outdoor recreation and wanted to examine how that time outdoors affected their well-being. Through this study, Puhakka (2021) found that being and exercising in these designated outdoor activity spaces provided students with the ability to improve their physical fitness, as well as gain “emotional and cognitive renewal, strengthened social relationships, relieve negative psychological effects of various stressors”. Benefits such as these highlight the importance of A. having these spaces placed all over campus and B. advertising them to students so that people

can access these resources and gain the benefits that come with them. At UBC, we are privileged to enjoy so many beautiful outdoor spaces, such as the Nitobe Gardens and Pacific Spirit Park, and getting to spend time in these places can offer a mental refresh or reset, which is in line with the types of benefits that Puhakka talked about. This type of evidence was also backed up in another study done by Thompson Coon et al. (2011), where they explored the difference in physiological and psychological effects when exercising indoors versus outdoors. They found that “exercising in natural environments was associated with greater feelings of revitalization and positive engagement, decreases in tension, confusion, anger, and depression” (Thompson Coon et al., 2011). Their research did not discredit anything about exercising indoors; in fact, they talked about how, when it comes to purely physical benefits, indoor spaces provide similar results. The main difference is that outdoor spaces offer very unique psychological benefits that cannot be as easily achieved by being stuck indoors (Thompson Coon et al., 2011). These findings are crucial for our research as they provide evidence of the positive impact outdoor spaces can have on physical and mental health. Understanding these benefits helps justify the importance of increasing awareness and utilization of UBC's outdoor spaces to enhance the well-being of the community.

Green exercise, characterized by physical activity in natural environments, has been associated with numerous physiological and psychological benefits (Wicks et al., 2021). However, Ambrey (2016) suggests that the design of green spaces and the variety of activities offered play crucial roles in optimizing these benefits. Biodiversity, inviting designs, and integration with recreational activities are key factors influencing the utilization and effectiveness of green spaces. Therefore, it is imperative to consider these aspects when planning and designing outdoor recreational areas. This information is vital for our research as it informs

the strategies we can propose to enhance the design and utilization of UBC's outdoor spaces, thereby maximizing their benefits for the community's well-being.

Despite the abundance of these spaces on campus, there seems to be a prevalent issue of underutilization and a lack of awareness among the UBC community regarding their potential for outdoor physical activity. The accessibility and location of these outdoor areas significantly influence their utilization and impact on community well-being (Thompson, 2013). Some individuals may be unaware of these spaces, while others face barriers hindering their accessibility. A comprehensive understanding of this current situation is essential for developing effective strategies to enhance awareness and utilization, with factors like geographical location, signage, transportation options, and infrastructure influencing accessibility. The justification for this report lies in the evident importance of these spaces for community health, emphasizing the need for increased awareness and utilization to amplify their positive impact on the UBC community's well-being.

Some research has been conducted in this field, particularly focusing on green spaces and outdoor sports facilities. An observational study done by Elkes et al. (2018), as part of the UBC Social Ecological Economic Development Studies (SEEDS) Sustainability Program, observed the usage of UBC outdoor recreational spaces. Their study focused on three main locations across campus: the skate park, the forestry field, and the basketball court. Elkes et al. hypothesized high usage of these three locations. Their findings suggested “that the need for socialization is just as salient as the need for activity... we believe that people were more likely to use the informal Forestry Field space due to its convenience, ease of use, and possible positive emotional connection to the space” (2018). Additionally, Holt et al. (2018) studied the active and passive use of green space, health, and well-being amongst university students at a liberal arts

university in the southeastern USA with a total undergraduate enrollment of 2800. Their results yielded that “students with frequent, active interactions were more likely to report high quality of life, low stress, and feeling 'very happy'” (Holt et al., 2018).

While the focus of this study is on understanding awareness and usage patterns, it is essential to acknowledge the broader context of sustainability and climate change in outdoor recreation. Askew & Bowker (2018) note that variable climate and a shifting focus to sustainable outdoor recreation activities may negatively affect some recreation activities, while other forms of outdoor recreation activities may benefit from increased participation. Despite the potential for increased participation in outdoor recreation, it is important to understand that outdoor recreation may pose a significant threat to plant and animal species (Rosenthal et al., 2022). Considering the impact of climate change on outdoor recreation opportunities as well as sustainability concerns for outdoor recreation spaces, many researchers have proposed measures to address environmental concerns for policymakers, developers, and participants. O’Toole et al. (2019) suggest six strategies for adapting outdoor recreation to climate change and fostering sustainable practices: safeguard vital environmental infrastructure, bolster measures against ecological harm from increased rainfall and other precipitation effects, address shifting visitation patterns, consider human well-being risks, manage recreational options in anticipation of future conditions, and adjust activities to align with climate change impacts. It is recommended that outdoor recreation professionals and stakeholders adopt elements of all of these strategies to develop an adequate approach to outdoor recreation, climate change, and sustainability.

This review underscores the considerable potential for physical activity within the diverse outdoor spaces of the UBC campus. Despite the richness of its landscapes, challenges persist in the form of underutilization and limited awareness. Relevant studies were used to explore the

benefits of these spaces and propose strategies to enhance community engagement. By prioritizing inviting, biodiverse green spaces, emphasizing sustainability, and addressing climate change concerns, our goal is to maximize the well-being impact of UBC's outdoor areas on the community.

The purpose of this study was to comprehensively understand the factors influencing the lack of utilization of UBC's outdoor spaces. We sought insights into the attractions from current users and aimed to uncover the barriers causing the underutilization by the rest of the UBC community. Simultaneously, this study investigated the current rates of awareness of these outdoor spaces, with a focus on designing strategies to enhance overall community engagement. This research was driven by the evident importance of these spaces for community health, highlighting the necessity for increased utilization to maximize their positive impact on the well-being of the UBC community.

Methods

Description of Population/Scope

The target population for this study was all members of the UBC community, which includes all people who currently study, live, and/or work at UBC. This study excluded all people who do not currently study, live, and/or work at UBC, as this population was not congruent with the research question and goals. Another reason why we have made this choice is that someone who does not meet the criteria is most likely not spending enough time on campus to be aware of or properly utilize the recreation spaces. For these reasons, any responses by these people would most likely contribute to a higher chance of inaccurate data that doesn't represent the true feedback of current UBC community members.

Survey Population

A mixed methods survey was conducted on members of the UBC community, and utilized many question questions that were answered on a Likert-type scale. The rationale for this decision was that the quantitative data allowed us to analyze rates and levels of awareness, and the qualitative data would give us the flexibility to conduct an analysis for the recommendations to UBC Rec. We decided on this method of data collection as we believed that it will not only allow us to reach more study participants but also increase the external validity of the results of our study.

Description of Outdoor Spaces/Scope

The survey questions focused on three main types of outdoor physical activity spaces on the UBC campus: built environments, natural environments, and cultivated environments.

Built environments refer to places such as MacInnes Field and the skate park, natural environments refer to places like Pacific Spirit Park and Wreck Beach, and cultivated environments refer to places like the Botanical Gardens and Nitobe Gardens. The rationale behind the decision to split up and group the various spaces in the question of our study was to limit the length of the survey to maintain participant engagement with the survey while still being able to answer our research question and achieve our research goal (Marcus et al., 2007). Additionally, these three types of outdoor physical activity spaces were chosen because they were highlighted in the UBC Rec project proposal and presented an opportunity to explore community awareness and usage behaviour trends related to the different types of spaces.

Sample Size

Our goal for sample size is a minimum of 100 participants, though after only half of the initially planned data collection period, our survey collected 87 valid responses. The survey was open from March 18th to April 3rd, 2024. We initially chose this range of sample size to be congruent with the expected participation in this survey, given the distribution modalities and expected time frame of 4 weeks. Additionally, we chose this range as our sample size goal to make informed suggestions to UBC Recreation to improve awareness and rates of use of these spaces. Once the data was collected, we used a combination of descriptive statistics and qualitative descriptive analysis to determine the levels of awareness for particular outdoor spaces along with the rates of use of these spaces.

Demographic Data

Survey participant demographic data was collected using 5 survey questions to identify trends in awareness and usage in the UBC populace. Demographic data on UBC affiliation, age, race and ethnicity, disability status, gender identity, and identity of lived experience as a trans individual were asked at the beginning of the survey. This was done in congruence with the recommendations from both the teaching assistant and the community partner, UBC Recreation. The responses to the questions were designed based on the UBC guidelines for demographic survey questions and provided the opportunity for the representation of different groups within the research data (UBC, n.a.). UBC affiliation, whether or not an individual worked, lived, or played on the University Endowment lands, data acted as our inclusion and exclusion criterion, which allowed us to ensure that those who took the survey actually live, work, play, or study on the UBC Campus. Demographic questions on age, disability status, ethnicity, gender identity,

and lived experience as a trans person allowed for the representation of different groups that fall into our inclusion criterion. This also provided an opportunity to view trends in outdoor physical activity space usage behaviours amongst the different groups

Survey Distribution Methods

The survey for our research was distributed as a poster with a QR code that contains the link to the Qualtrics survey itself. The distribution modalities chosen to reach our target population included using UBC Recreation's social media platforms, the UBC Skateboarding Club's social media, the researcher's personal social media platforms, and bulletin board postings with the QR code for the survey on them. The bulletin board posters were posted in the first-year residences, major faculty buildings, all of the libraries on campus, including IKB, Koerner, Woodward, and others, Wesbrook Community Center, and the UBC gyms, including the ARC and the COOP. Permission was sought and gained for the distribution of the posters, and none of the facilities targeted opposed the research project. The rationale for the inclusion of the Wesbrook community center was that Wesbrook is technically still on endowment lands and has many students, families, and faculty members who go there. Posters were distributed at the bulletin boards at the Wreck Beach entrance and the entrance bulletin board at the Great Pacific Spirit Park. It was decided that surveying some of the locations our study covered would be beneficial, as those who were already physically active in one space may not be aware of other physical activity spaces around the campus. Bulletin boards at the Bird Coop, ARK, and AMS Nest were also used as distribution centers for our survey and the QR code. We decided that it would be beneficial to our study to attempt to include people who are already physically active indoors and are also in places of high foot traffic.

Data Analysis

Our study will employ a mixed-methods approach to comprehensively assess the awareness and use of outdoor spaces at UBC, encompassing both quantitative and qualitative survey questions.

Statistical Analysis:

Descriptive data analysis entails summarizing and interpreting data to grasp fundamental characteristics like central tendencies and distributions, often utilizing graphs like histograms or bar graphs to visually represent these features for clearer understanding. This type of analysis will be applied to the data obtained from the survey. Quantitative analysis will be used to assess responses to the Likert-scale questions of how often such spaces are used and what level of awareness exists to determine some general trends or patterns exhibited by the members of the UBC population. This will carry through to the demographic data to allow us to attempt to see if there are any particular differences in place awareness and usage between various groupings of people within the UBC community (e.g., by age, gender identity, or UBC affiliation). The use of descriptive statistics for this information on the demography will help in creating a picture of how representation and diversity in responses will serve our recommendations on UBC Recreation Services within a whole group.

Qualitative Analysis:

Our survey questions will also be analyzed with Descriptive Qualitative Analysis, a combined approach to both inductive and deductive strategies for coding. This form of analysis is most appropriate for the richness and diversity contained in these responses. Survey questions will be designed so that we can gather qualitative data on the nature of common barriers to space use (i.e., safety, access, and time barriers) and possible suggestions for enhancing engagement.

Through this approach, the qualitative data will excel in its capacity to inform contextually nuanced and detailed recommendations for UBC Recreation.

We will use deductive coding to organize responses into categories that align with our research goals of perceived behavioral control. This method is especially valuable for examining specific hypotheses regarding behaviors and obstacles related to space usage. Responses to these questions would be analyzed to measure the prevalence of these predefined themes among the survey participants.

Conversely, inductive coding will be employed to uncover themes that emerge spontaneously from the data, without preconceived categories. Inductive coding ensures our analysis remains flexible and responsive to the data, allowing for a more comprehensive and authentic capture of the UBC community's experiences and needs. The data for this analysis will be derived from our open-ended questions and will be analyzed for emerging themes not initially identified by the research team.

Integration for Comprehensive Analysis:

The integration of Descriptive Statistical Analysis and Descriptive Qualitative Analysis allows us to not only quantify the rates of awareness and usage but also to understand the underlying reasons for these trends and to gather direct community input on potential improvements. By utilizing both types of analysis, we ensure that our methodology is robust, ensuring that our recommendations to UBC Recreation are both evidence-based and informed by community voices, aligning with our project's aim to enhance outdoor physical activity opportunities on campus.

Results

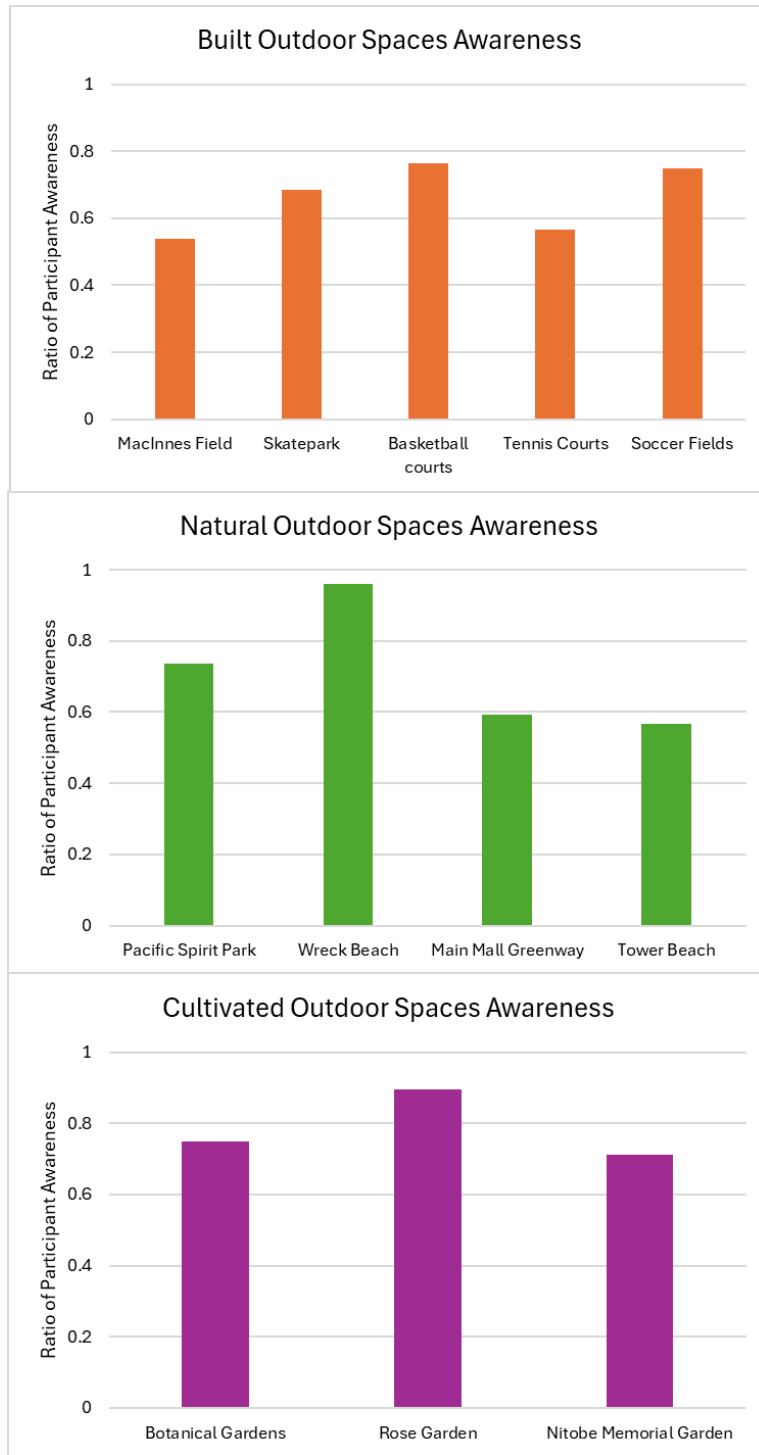


Figure 1: Bar graphs providing visual comparisons of awareness levels across built, natural, and cultivated outdoor spaces, derived by tallying awareness responses and dividing by the total number (76).

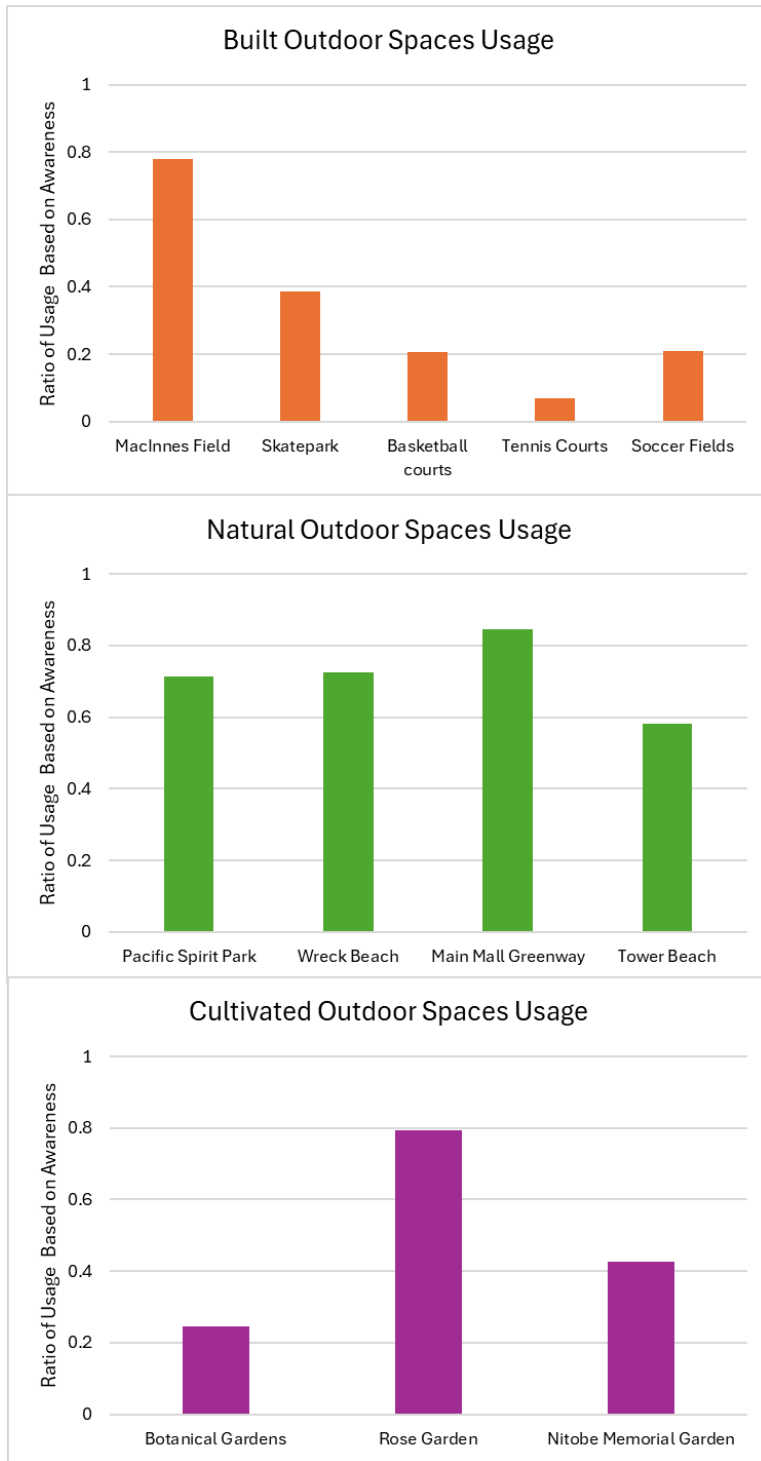


Figure 2: Bar graphs providing visual comparisons of usage levels across built, natural, and cultivated outdoor spaces, derived by tallying usage responses and dividing by the number of participants aware of those spaces.

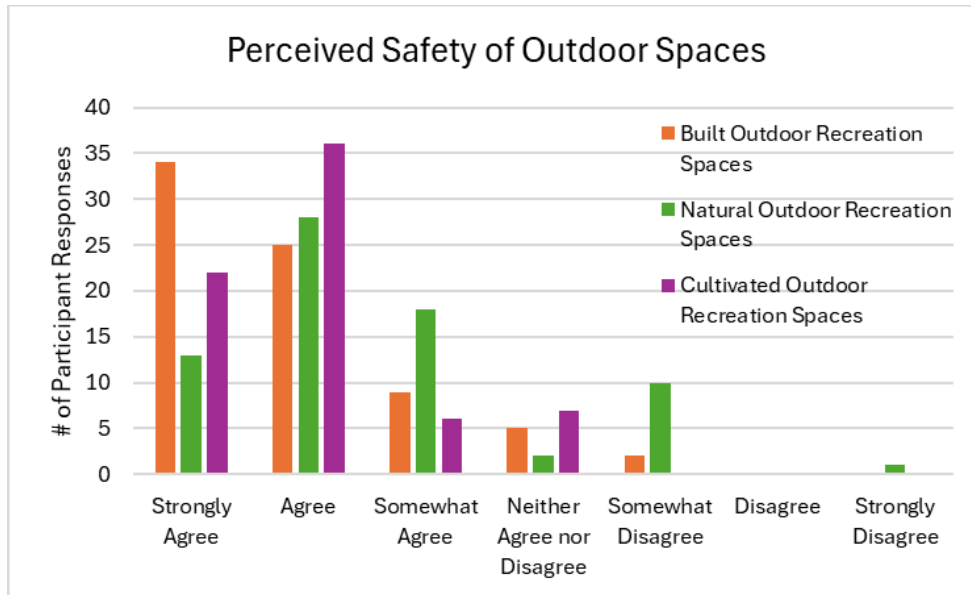


Figure 3: A bar graph depicting the distribution of survey responses regarding the perceived safety of outdoor recreational spaces, measured on a likert scale.

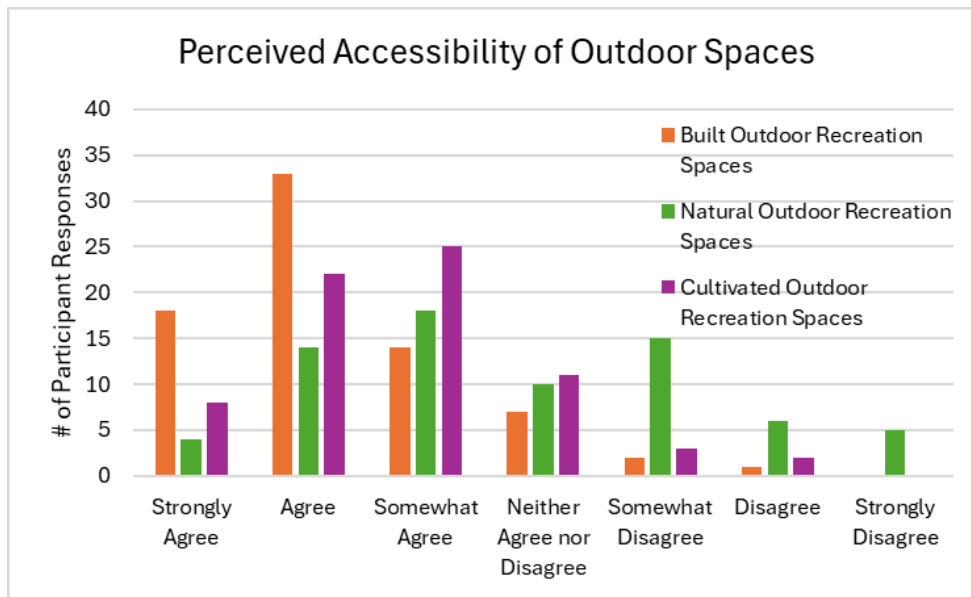


Figure 4: A bar graph depicting the distribution of survey responses regarding the perceived accessibility of outdoor recreational spaces, measured on a likert scale.

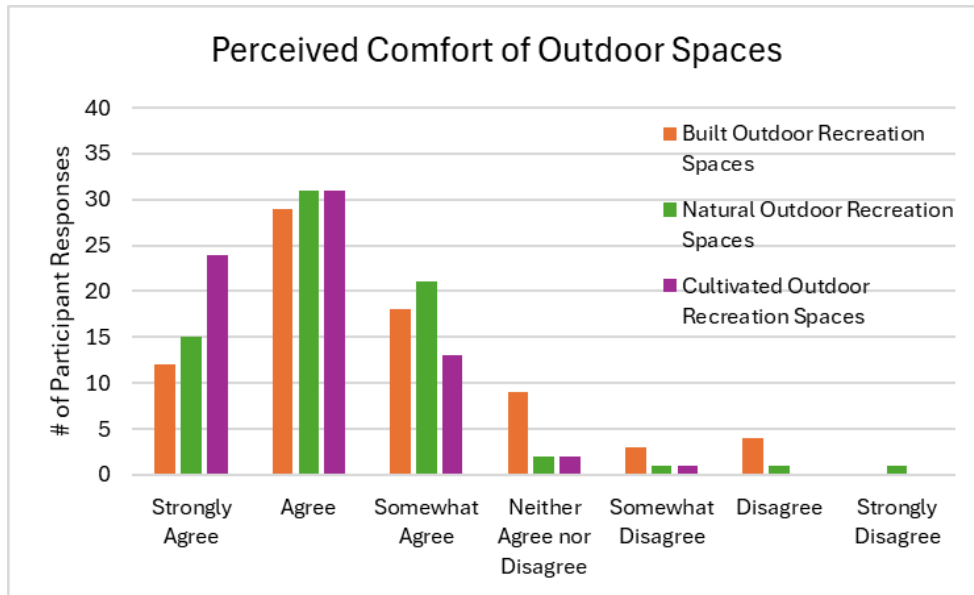


Figure 5: A bar graph depicting the distribution of survey responses regarding the perceived comfort of outdoor recreational spaces, measured on a likert scale.

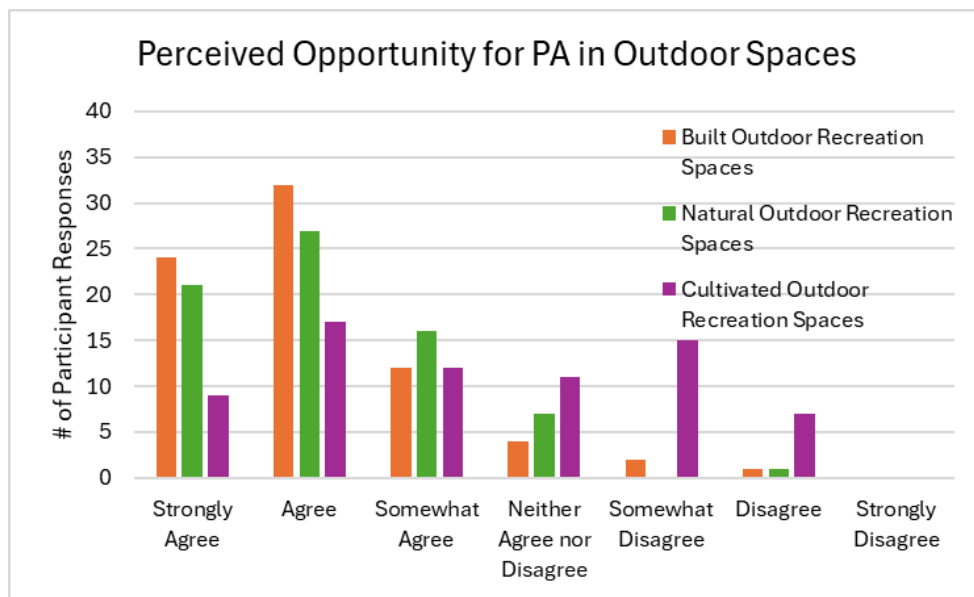


Figure 6: A bar graph depicting the distribution of survey responses regarding the perceived opportunity for physical activity (PA) in outdoor recreational spaces, measured on a likert scale.

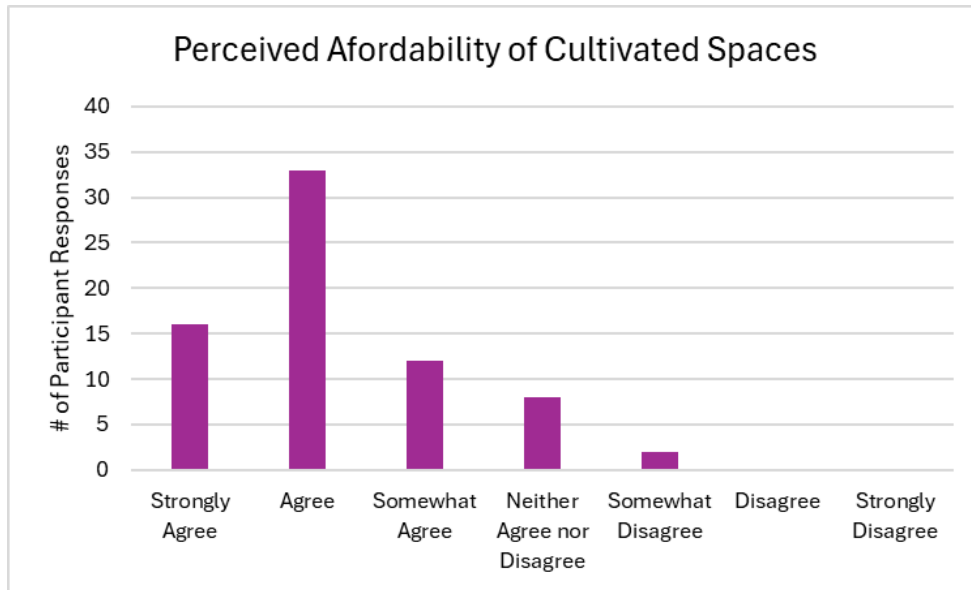


Figure 7: A bar graph depicting the distribution of survey responses regarding the perceived affordability of cultivated spaces, measured on a likert scale.

On the perceived safety of outdoor recreational spaces, participants predominantly agreed on a sense of safety within built and cultivated spaces, indicating a widespread perception of security in these environments. However, when it came to natural spaces, while still leaning towards agreement, there was a notable shift towards a greater degree of concern. This suggests that while participants generally perceive natural spaces as safe, there is a slightly heightened level of apprehension compared to built and cultivated areas.

In terms of perceived accessibility of the outdoor recreational spaces, the majority of participants leaned towards agreement regarding the accessibility of built spaces, suggesting that these areas are the most easily accessible. However, perceptions shifted towards the notion of inaccessibility when it came to natural spaces. Cultivated spaces, while slightly more centralized, still tended to be viewed as more accessible overall.

On the perceived comfort of these outdoor environments, the responses uniformly skewed towards agreement across the board. This indicates a widespread perception among

participants that built, natural, and cultivated spaces alike offer a comforting experience, emphasizing the universality of comfort within these settings.

When considering the perceived opportunity for physical activity, participants tended to agree that both built and natural spaces provide ample opportunities for such activities. However, cultivated spaces appeared to lean towards a perception of having limited opportunity in this regard. This suggests a discrepancy in the perceived suitability of different types of outdoor recreational spaces for physical activity.

Descriptive Qualitative Analysis

In exploring the barriers encountered within UBC's outdoor physical activity places, open-ended questions focused on deductive and inductive coding confirmed the anticipated challenge of overcrowding and limited space for recreational activities in the more centralized spaces. These comments were focused on spaces such as MacInnes Field that were better known and had high numbers of park users, as highlighted by 9 out of the 41 respondents to the barrier specific question. This aligns with the overarching focus of the study, potentially laying the groundwork for improving awareness and utilization rates of all outdoor spaces. This enables a broader spectrum of community members to discover outdoor environments tailored to their exercise preferences. Furthermore, participants' concerns over safety due to inadequate lighting along hiking trails, as expressed by 3 individuals, underscore the need for infrastructure improvements to enhance safety and accessibility within outdoor recreation areas. Participants also highlighted the absence of indoor skateboarding facilities during inclement weather, expressing concerns over safety and restricted access to alternative spaces like parking garages.

Regarding suggestions for enhancing UBC's outdoor recreation spaces and associated programs, feedback from a total of 39 respondents highlighted various suggestions, including the desire for expanded hiking programming. Particularly notable were suggestions focusing on organized hiking groups to foster social engagement and educational opportunities. Similar sentiments were echoed for running groups, indicating a broader need for group-based outdoor activities. Additionally, respondents expressed interest in guided tours of existing outdoor recreation spaces to improve awareness and utilization. Recommendations for improved lighting along trails and within skate parks were recurrent themes, aligning with identified barriers such as safety concerns and weather limitations. There were also suggestions for addressing time constraints and the absence of companions for outdoor activities, which highlight potential avenues for fostering community engagement and inclusivity within recreational programming.

Exploring incentives for utilizing outdoor recreation spaces, out of a total of 33 respondents, there was notable emphasis on the importance of group-based programming to facilitate social interaction and foster a sense of community. Opportunities for social connection emerged as the most prevalent motivator among participants. Furthermore, suggestions for free or discounted access, coupled with the appeal of clean, aesthetically pleasing environments (mostly focused on cultivated spaces), underscored the role of incentives in promoting engagement with outdoor spaces. However, the concept of "dry" spaces as an incentive presents a challenge in its implementation within outdoor settings, warranting further exploration of participant needs and preferences.

Participant Description

Our survey had 87 responses but only 76 made it past the first inclusion criteria question. 49% were men, 47% were women, 3% were non-binary/Queer and 1% preferred not to say. 63%

of the participants had no disability, 4% had a physical disability, and 24% had mental and/or neurological disabilities. 24% of the participants were in the age range of 16-20, 65% were 21-25, and the other 11% were 26 and above. 36% of participants were Caucasian, 27% were Chinese, and the other 37% were a mix of all the other ethnicities.

Discussion

From our survey data, we found that there was only a moderate variation between the awareness rates of the outdoor spaces we identified. With no space dropping under 50% awareness and only two spaces being higher than 80% awareness, Wreck Beach, and the Rose Gardens (see Figure 1). However, Figure 2 shows that spaces were utilized at different rates despite the similar awareness ratings. These findings lead us to believe that participants' perception of the specific spaces had a greater impact on the usage than participant awareness of the spaces. Given that most participants were aware of the spaces we identified, we focused on discussing the perceptual differences found in our Likert scale questions (see Figure 3-7) and the qualitative questions asked (see Appendix).

Participants expressed higher concerns about the safety of the natural outdoor spaces compared to the built or cultivated spaces (see Figure 3). These findings concurred with the qualitative data collected, where participants expressed safety concerns with using the trails and beaches around the UBC campus. Three participants expressed concerns about inadequate lighting on the hiking trails, whereas others expressed concerns about potential assault. Additionally, one participant disclosed being a victim of a past sexual assault at Wreck Beach. These findings align with previous research that identified concerns with outdoor spaces when alone or at night (Kaplan & Chalfin, 2022). Consequently, these safety concerns pose significant

barriers to outdoor physical activity, particularly for women and individuals hesitant about solitary activities (Roper, 2016). However, it was also identified that, while there are concerns regarding the safety of the natural spaces, they have consistently high usage rates. These findings could be because the spaces were known to be free to use, thus making them affordable. More research should be conducted on the variation in usage rate based on perceived safety versus perceived affordability.

While the natural outdoor spaces did seem to have high usage rates (see Figure 2), it was also noted that they scored relatively low on perceived accessibility compared to cultivated or built environments (see Figure 4). The accessibility of natural outdoor spaces is an often-undervalued aspect of design and management (Groulx et al., 2021). This correlates with our data, which shows natural spaces have the lowest perceived accessibility of the outdoor spaces viewed. Groulx et al. (2021) also explained that for equal accessibility to be possible in parks and natural outdoor spaces, the values of equality need to not only include physical landscape adaptations but also be embedded into “the visitor experience philosophy”. The small sample size of our project could underrepresent those who require accessibility accommodations and should be considered in any adaptations going forward.

Both built and natural outdoor spaces were identified to have a high perception of opportunities for physical activity, however, cultivated outdoor spaces had a much lower average agreement (see Figure 6). This is likely due to the spaces being gardens, and not having a lot of space for running or playing sports. However, the cultivated spaces also offer an opportunity for walking, yoga, and other low-movement physical activities. This could be a perceived social norm or social perception of what physical activity is, something this study did not research and could be the topic for future studies.

Many of the spaces with the highest usage ratings (see Figure 2) were also noted to be overcrowded and provide limited space for physical activity. Many of the higher usage rate spaces were in high-traffic areas on the UBC campus. Participants noted that places like MacInnes Field are often overcrowded due to their popularity as a recreation and relaxation spot during a warm day. This led them to express that the field did not provide adequate opportunity to perform physical activity, thus they perceived a lack of control in their ability to utilize the space. Alternatively, built outdoor spaces had a slightly lower average perceived comfort compared to natural and cultivated spaces (see Figure 5). This is likely due to the spaces being recognized as more useful for sports rather than recreation, given that many spaces do not have relaxation components to their design. Pope et al. (2015), discovered that green spaces are most utilized when they are recognized as a space for both physical activity and recreation, the popularity of MacInnis Field hinders its ability to afford space for physical activity. Spaces like soccer fields, basketball courts, and tennis courts were viewed as only available to student-athletes and thus had low usage rates. This shows that individuals perceived that they had low control over access to these spaces. Changing the perception of the other built outdoor spaces might reduce the overcrowding of MacInnis Field by offering alternative spaces for relaxation and recreation, thus freeing space on MacInnis Field for physical activity.

Time constraints were also listed as a leading constraint for outdoor physical activity space utilization. This coincided with Dhurup & Garnett's (2011) findings, where participants not having enough time or being too busy were listed as the third and fourth biggest constraints to physical activity among university students, respectively. Time constraints are often a concern for university students due to classes, assignments, work, and transportation. This is a difficult constraint to address given the current system structure, although moving the classroom outdoors

could present a possible strategy. Alternatively, creating connected green networks throughout campus, like the Main Mall Pathway, could provide more opportunities to experience the spaces while students travel from class to class. This is supported by Kajossari & Pasanen (2021), who explained that larger green spaces, like connected green networks, have more benefits than smaller spaces built into the urban landscape.

Another constraint identified by participants was the affordability of some spaces, particularly the Botanical and Nitobe Gardens (see Figure 7). Coincidentally, both locations are free for UBC card holders. Many participants perceived that they could not afford to visit the spaces, yet it did not cost them anything financially. While the affordability of many indoor physical activity places may be a significant constraint, all the outdoor physical activity locations we reviewed were free to use for UBC Card holders. Additionally, both the Botanical and Nitobe Gardens were found to have very low usage rates compared to the Rose Gardens (see Figure 2). The Rose Gardens were more known to be a free location to visit; this suggests that the perceived affordability of the Botanical and Nitobe Gardens may be substantially reducing their usage. Furthermore, if the usage rate of all three garden spaces can be increased, it would be of significant benefit to the UBC community. An increase in biodiversity in green spaces, particularly plant diversity, is beneficial to not only participants' enjoyment of the spaces but also to the well-being benefits they receive from visiting them (Fuller et al., 2017). Given that some participants expressed that they were drawn to aesthetically pleasing and clean environments, the biodiversity could be expanded beyond just the gardens to other outdoor spaces.

Participants also expressed reservations about using the outdoor spaces throughout the year due to inclement weather in the Vancouver area. Much of the fall and winter semesters at UBC are spent in rain, cold, or snow. This was a common explanation among participants for

why they do not utilize many of the outdoor spaces. Our findings coincide with Tucker & Gilliland's (2007) study on the effects of season and weather on physical activity, which identified "poor and extreme weather" as a barrier to participation in physical activity. Many participants shared their desires for more covered outdoor areas that stay dry in the rain or for alternative options for traditional outdoor activities, like skateboarding. Inclement weather was perceived as limiting their control over their participation in outdoor physical activities due to the spaces not affording them a safe, dry, and comfortable place to visit. Consequently, while we will recommend some solutions to this problem later in the paper, more research on this area is required to better understand how to make outdoor physical activity spaces more accessible during unpleasant weather conditions.

A common request among respondents to the survey was to expand organized hiking group programming and guided group-based outdoor tours of existing recreation spaces. These recommendations do hold some merit, as exercising in groups does provide some additional benefits when compared to exercising alone (Burke et al., 2006). Many participants cited the desire to build social connections and create a more connected community as their reason for wanting more group activities. Additionally, more outdoor physical activity groups would also provide those who have concerns about safety with an opportunity to experience outdoor spaces in a safer environment.

Recommendations

Based upon the data we collected, and our discussion above, we have identified key recommendations for our partner, UBC Rec. These recommendations include both short-term and long-term sites for action. Our short-term sites for action recommendations can be

conceptualized as immediately actionable recommendations as they are relatively easy to implement. Our long-term recommendations are relatively harder to implement as they would involve greater planning and coordination across departments, and can therefore be conceptualized as aspirational goals for improving outdoor recreation for members of the UBC community.

The first short-term immediately actionable recommendation would be to implement social groups for various outdoor recreation activities. These social groups could include hiking groups and running groups. This recommendation is justified by our findings, as combining the survey respondent's identified lack of friends to participate in outdoor recreation with a lack of education around existing hiking trails and a lack of existing outdoor recreation groups contributes to a significant portion of the survey responses. A hiking group can facilitate social connections and therefore address the common barrier identified as having a lack of friends to participate in outdoor recreation with. A hiking group can also address the identified lack of awareness and education about existing hiking trails, specifically in natural outdoor recreation spaces, if an education component is integrated into the group. This could easily be addressed if volunteer-based recruitment methods are used to recruit individuals with existing knowledge about hiking in natural outdoor recreation spaces, and these individuals can educate other members of the group about existing trails, hiking etiquette, and more general knowledge about the campus's outdoor recreation potentials. These recommendations are supported by our use of TPB, because attitudes, social norms, and perceived behavior control constructs can all be positively impacted for participants in these groups, potentially increasing their intention to use outdoor recreation spaces, and therefore their usage of these spaces. Additionally, this

recommendation would address our survey participant's identified concerns about safety.

Participant concerns about safety when participating in outdoor spaces alone, without others to support them, may be addressed by providing the opportunity for these individuals to join groups where safety can be provided by other members of these groups. Social groups are relatively low-cost to implement if volunteer-based leadership is utilized, and can be easily implemented in comparison to structural, or environmental, based recommendations for improving outdoor recreation.

Our second short-term recommendation would be to create official spaces for informal outdoor recreation, specifically in built outdoor recreation spaces like McInnes Field, where reported usage was significantly larger than alternatively built outdoor recreation spaces. This recommendation is supported by our study findings because overcrowding and a lack of space to participate in informal recreation activities made up a significant portion of the barriers identified by survey respondents. This recommendation would target improving and supporting recreation programming in spaces like McInnes Field for users who would like to participate in recreation activities, but cannot do so because the spaces are used by large groups of people for socializing, relaxing, working, and studying. Sectioning off a particular area of McInnes Field for activities like soccer, spike-ball, physical activity classes, and other recreation activities would be relatively easy to implement because no new infrastructure needs to be built, and existing campus groups like UBC Rec can utilize staff and volunteers to provide these programs. Implementing programs in these spaces during times of high-usage, for example, when good weather supports outdoor-recreation, may contribute to significantly improving the overall usage rates of outdoor recreation spaces on campus. Additionally, the identified lack of time barrier for

survey respondents may be addressed if easy to access recreation opportunities are provided in centralized outdoor recreation spaces, like McInnes Field, during specific times on weekdays where members of the UBC community can carve out a small time in their schedule for recreation.

A long-term or aspirational recommendation based upon our study findings would be to create an app or website page that acts as a centralized location for knowledge dissemination about outdoor recreation spaces, the availability of these spaces, and the existing programming opportunities provided by campus groups in these spaces. This app or website page would provide members of UBC's community with a detailed map of built, natural, and cultivated outdoor recreation spaces across campus so that user's have greater knowledge of the existing spaces that can be used for outdoor recreation. This suggestion is supported by our findings, as many survey respondents reported a lack of awareness about existing outdoor spaces, a lack of education about where to look for a map of these spaces, a lack of awareness about who is using these spaces and when they could use these spaces (i.e., when is a space reserved for varsity athletics vs. when is the space open to general use), as well as a lack of awareness about existing programs that utilize these spaces. A centralized app or webpage that provides users with detailed maps, schedules for the groups who are using these spaces, and easy-to-see opportunities for engaging with existing programming opportunities, may serve to address all of these identified concerns. This would be a long-term or aspirational goal because the development of an app or webpage that synthesizes all of the areas identified above would require considerable time, effort, cost, and coordination across campus groups to implement. An alternative to developing digital resources for improving outdoor recreation would be to promote

education targeted at first year undergraduate students on campus. Utilizing existing programs like JumpStart and/or Imagine Day would serve to target a significant portion of survey respondents who identified a lack of education opportunities around outdoor recreation on campus. Targeting undergraduates who are early in their academic careers would serve to improve long-term usage and awareness of outdoor recreation spaces. Additionally, having digital resources to provide education would address the portion of survey respondents who were unaware of the low-cost opportunities for outdoor recreation on campus, such as student discounts for cultivated outdoor spaces.

The second long-term recommendation based upon our study findings would be to improve covered, or partially covered, outdoor recreation spaces on campus. This recommendation is justified based on the significant portion of respondents who identified weather as a barrier to engaging in outdoor recreation. The broadly identified need for addressing weather-related barriers is specifically supported by the survey respondents, who wanted to see improved skateboarding programs on campus. UBC's Vancouver campus features the only on-campus university skatepark in North America. This is an important element of UBC's outdoor recreation opportunities and further supports the significant strides that UBC is making towards becoming a world-leader for university outdoor recreation opportunities. However, there are currently no programs that support indoor-skateboarding opportunities for members of the UBC community. Considering that the majority of UBC community members live, work, and play on campus during Vancouver's rainy season, the UBC skatepark may be underutilized by the community as skateboarding participation is negatively impacted by poor weather conditions. This recommendation is also supported by the survey respondents, who did not report

participating in skateboarding-related outdoor recreation, but nevertheless identified weather as a significant barrier. Improving partially-covered spaces into built, natural, and cultivated outdoor spaces may increase usage in a variety of settings. An important example would be the gazebo featured in the Nitobe Gardens. This partially covered structure provides the opportunity to engage with cultivated outdoor spaces regardless of weather. Creating more covered spaces like this would improve outdoor space usage throughout the year, particularly during the fall, winter, and spring seasons, where UBC outdoor spaces have the greatest opportunities for usage. This is a long-term recommendation, as providing partially-covered spaces involves significant planning, resource allocation, and coordination. However, based on our survey respondents, achieving this recommendation would address our study's findings around the common barriers that members of the UBC community face in engaging with outdoor recreation spaces.

Conclusion

In this study, our research aimed to assess levels of outdoor space usage, awareness, and associated barriers/facilitators at UBC, including factors such as perceived safety, awareness of cost, distance from the center of campus, weather, and lack of social connection. Based on the responses, we hoped to take survey participants' feedback and make recommendations that would help to remove any barriers people had and increase usage across campus.

Most spaces have high awareness rates, but their usage depends on some key factors. The usage depends on perceived safety, awareness of cost, distance from the center of campus, weather, and lack of social connection. We then proposed some ways to counteract these issues and increase the usage of these spaces in the future. To address the safety and lack of social connection barriers, we proposed trying to create exercise classes/groups that could participate

together. A very popular activity that was found in the survey was hiking, so some hiking groups through places like Pacific Spirit Park (which received feedback as a place people felt unsafe due to being alone and not enough lighting), would be beneficial to get more people involved. For issues about weather, we proposed trying to come up with coverings that could be put over outdoor spaces like the skate park, basketball, and tennis courts, so that the usage rates of those spaces will not be affected during the rainy seasons. We also suggested putting gazebos in place in both natural and cultivated spaces to allow for some cover where people can still exercise or have social time regardless of the weather. Finally, to increase awareness about these spaces, we suggested the implementation of an app that contains all of the hours that each outdoor space on campus is available to use for free to the public. Future research on this topic, particularly focusing on UBC, would be to measure the community's desire for these recommendations along with what other recommendations the community may want. Some limitations of our study include the small time frame in which our survey was available to the UBC community, hindering the validity of our results and limiting the sample size we were able to collect.

If these recommendations are implemented, we think that UBC will increase the strength of the 'active campus culture', which will result in a community that is more physically active and has a stronger connection to the environment in which they live, work, or study.

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Appendix

Survey Recruitment Poster



THE UNIVERSITY OF BRITISH COLUMBIA

School of Kinesiology
210-6081 University Boulevard
Vancouver, BC Canada V6T 1Z1

Phone 604 822 9192
Fax 604 822 6842
www.kin.ubc.ca

If you care about outdoor recreation and leisure at UBC we would love to hear from you!

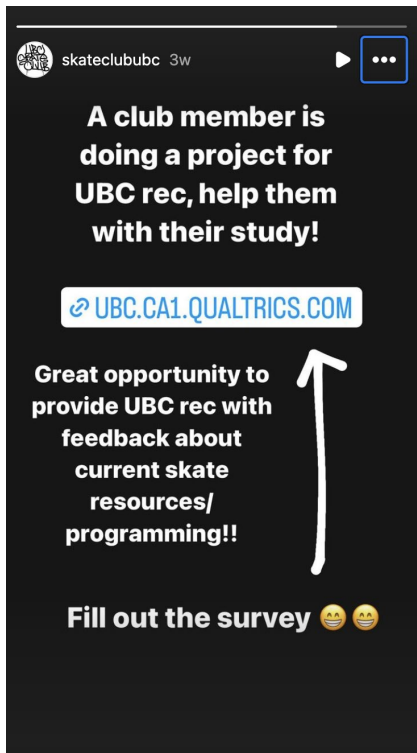
Survey respondents will have the opportunity to enter a draw to win one of the following prizes: Lululemon yoga mat (2), UBC Athletics Prize Pack (4)

For more information follow the link/QR code or contact
alexstoiber2@gmail.com
Project ID: H17-03560-A017
Group 10

Please note that this post is public and anyone who likes, comments, or shares the link will, by doing so, be associated with the study. The Principal Investigator on this project is Dr. Andrea Bundon (andrea.bundon@ubc.ca)



Example of social media recruitment post



Community Partner Presentation Poster

University of British Columbia; Kin 464

OUTDOORS AND ACTIVE: A Look into UBC's Greenspaces

Alex Stoiber, Thomas Kranjc, Michael Burran, Amir Alimadad, Daniel Munn
Community Partner: UBC Recreation; Emily Jarvis

Intro

- UBC's campus offers several outdoor spaces that can be used for many different activities, including physical activity
- Members of the UBC community seemingly underutilize these spaces, while they could be used more to increase the physical activity levels of UBC community members

Research Questions/Objectives

- Understand the current rates of awareness and usage of various physical activity spaces across campus
- Gain insight as to what features could make using these spaces more attractive
- Gain insight as to what barriers prevent people from using these spaces more regularly/all
- Provide recommendations for UBC Recreation

Methods

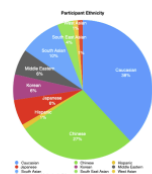
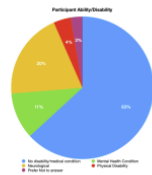
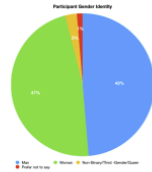
- The target population for this study is all members of the UBC community who currently study, live, and/or work at UBC.
- The survey questions focus on three main types of outdoor physical activity spaces on the UBC campus: **built environments, natural environments, and cultivated environments**
- We collected 57 responses to the survey, which was open from March 18th - April 3rd
- We used a combination of descriptive statistics and qualitative descriptive analysis to determine the levels of awareness for particular outdoor spaces, along with the rates of use of these spaces
- This survey was distributed via a QR code that contained the link to the Qualtrics survey itself. The distribution modalities chosen to reach our target population included
 - Using UBC Recreation's social media platforms
 - The UBC Skateboarding Club's social media platforms
 - Researcher's personal social media platforms
 - And bulletin board postings with the QR code for the survey on them
- Our study employed a mixed-methods approach to comprehensively assess the awareness and use of outdoor spaces at UBC, encompassing both quantitative and qualitative survey questions.

- **Theory of Planned Behaviour:** A focus on perceived behavioural control because it is a good predictor of actual behaviour.

- **Perceived Behaviour Control:** Individuals' perception of self-efficacy.

- **Qualitative Analysis Theoretical Foundation:** Assess individuals' perception of self-efficacy, meaning what is their perceived control in accessing and utilizing the outdoor physical activity spaces on the UBC campus.

Study Demographics



Study Findings

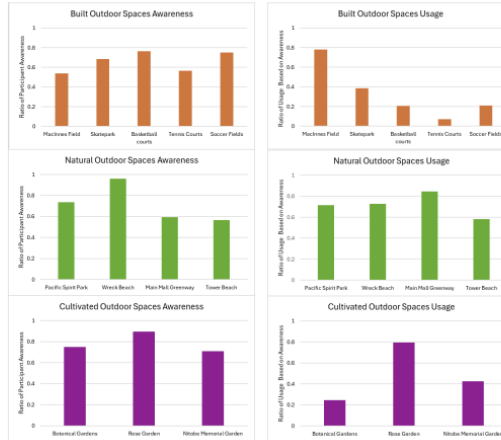
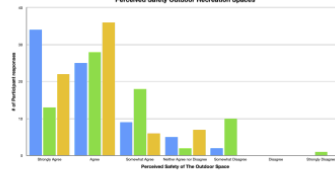


Figure 1: Bar graphs providing visual comparisons of awareness levels across built, natural, and cultivated outdoor spaces, derived by tallying awareness responses and dividing by the total number (76).

Figure 2: Bar graphs providing visual comparisons of usage levels across built, natural, and cultivated outdoor spaces, derived by tallying usage responses and dividing by the number of participants aware of those spaces.

Recommendations for Partner

Barriers Faced

- Participants reported the main barrier faced being too many people, overcrowding, or not enough space to participate in recreation
- Participants identified the lack of indoor skateboarding spaces as a barrier
- Lack of adequate lighting for hiking trails is a deterrent to recreational use, especially at dawn, dusk, and night
 - Safety concerns

Recommendations for Programming

- The most common recommendation was to improve hiking programming
 - Organize hiking groups that can provide a sense of social interaction as well as education
 - Guides to the current outdoor recreation spaces/guided tours of the outdoor recreation spaces
- A common incentive/motivation that was mentioned was group-based programming

Recommendations to Improve Usage/Awareness

- Free-to-use and student discounts were mentioned multiple times
 - This is mostly already implemented and is a benefit of outdoor physical recreation spaces
 - Possible further education/advertisement for the UBC populous
 - Clean, aesthetically pleasing, and "vibes" were mentioned as incentives to use the spaces
 - Nitobe Garden inspired Gazebo at Wreck Beach and Pacific Spirit Park
 - Great for outdoor yoga programs out in nature
 - Further community research could be done to measure the desire for these structures

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Survey

4/12/24, 10:00 PM

Qualtrics Survey Software

Block 8

Do you work, study, and/or live at UBC?

- Yes
- No

Demographic Questions

Which of the following statements best describes your primary relationship with UBC?

- I am an undergraduate student
- I am a graduate student
- I am a faculty member
- I am a staff member
- I am an alumni
- I am a community member
- Other:

What is your gender identity?

- Woman

- Man
- Non-Binary / Third Gender / Queer
- Two-Spirit
- Other
- Prefer not to say

Do you have lived experience as a trans person (meaning that your gender identity does not align with your sex assigned at birth?)

- Yes
- No
- Prefer not to answer

What ethnicity do you identify with most?

- Caucasian
- Chinese
- South Asian
- Korean
- South East Asian
- Hispanic
- Middle Eastern
- Phillipino
- Japanese
- Indigenous, Metis, Inuit

- African, Caribbean
- Other:

Do you have any of the following disabilities or ongoing medical conditions that have affected your everyday functioning?

- Physical Disability
- Blind/Visually impaired
- Deaf/Hard of Hearing
- Mental Health Condition
- Neurological (learning Disability, ASD, Traumatic Brain Injury, ADHD, etc.)
- Chronic Health Condition (Crohn's, HIV, etc.)
- if none of the above please specify:
- I don't have a disability or ongoing medical condition
- Prefer not to answer

What is your age?

- 16-20
- 21-25
- 26-30
- 31-35
- 36-40

- 41-64
- 65+

Built Environment Usage/Awareness Questions

Built outdoor recreation spaces are made by UBC to provide the community with various options for physical activity and leisure. With this in mind, which of these built spaces are you aware of?

- UBC MacInnes Field
- UBC Skatepark
- UBC Basketball courts: Thunderbird Court (located near Totem Residences), Basketball court located on Health Sciences Mall road, Basketball court located in front of the AMS Student Nest.
- UBC Tennis Courts: Thunderbird sport courts
- UBC Soccer Fields
- Other/Not Included Above

From the built spaces you have chosen, which of them have you used/accessed in the past year?

- » UBC MacInnes Field
- » UBC Skatepark

- » UBC Basketball courts: Thunderbird Court (located near Totem Residences), Basketball court located on Health Sciences Mall road, Basketball court located in front of the AMS Student Nest.
- » UBC Tennis Courts: Thunderbird sport courts
- » UBC Soccer Fields
- » Other/Not Included Above

I feel **safe** at UBC's built outdoor recreation spaces

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

UBC's built outdoor recreation spaces meet my needs for accessibility (for example, adequate accessibility for individuals with physical disabilities, adequate visual accommodations in the built environment for individuals with visual impairments)

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

UBC's built outdoor recreation spaces offer a sense of **comfort**

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

UBC's built outdoor recreation spaces facilitate the opportunity for physical activity

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Feel free to share any additional thoughts or feedback here

Natural Environment Usage/Awareness questions

Natural outdoor recreation spaces at UBC offer unique environments for physical activity and relaxation. With this in mind, which of these natural spaces are you aware of?

disabilities, adequate visual accommodations in the built environment for individuals with visual impairments)

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

UBC's natural outdoor recreation spaces offer a sense of **comfort**

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

UBC's natural outdoor recreation spaces facilitate the opportunity for physical activity

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Feel free to share any additional thoughts or feedback here

- Pacific Spirit Park
- Wreck Beach
- Main Mall Greenway
- Tower Beach
- Other/Not Specified Above

From the natural spaces you have chosen, which of them have you used/accessed in the past year?

- » Pacific Spirit Park
- » Wreck Beach
- » Main Mall Greenway
- » Tower Beach
- » Other/Not Specified Above

I feel **safe** at UBC's natural outdoor recreation spaces

- | | | | | | | |
|-----------------------|-----------------------|-----------------------|----------------------------|-----------------------|-----------------------|-----------------------|
| Strongly Disagree | Disagree | Somewhat Disagree | Neither Agree nor Disagree | Somewhat Agree | Agree | Strongly Agree |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

UBC's natural outdoor recreation spaces are accessible (for example, adequate accessibility for individuals with physical

UBC's cultivated outdoor recreation spaces are accessible
(for example, adequate accessibility for individuals with physical disabilities, adequate visual accommodations in the built environment for individuals with visual impairments)

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

UBC's cultivated outdoor recreation spaces are affordable

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

UBC's cultivated outdoor recreation spaces offer a sense of comfort

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

UBC's cultivated outdoor recreation facilitate the opportunity for physical activitiy

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Open ended questions

What are the activities you use UBC's outdoor recreation spaces for (i.e., light/vigorous exercise, alone time/social time, non-physical activities like reading etc.)

What barriers do you face in these spaces?

How can UBC enhance its outdoor recreation spaces and the programs provided within these areas? Are there specific

outdoor programs you would like to see introduced or expanded (e.g., hiking)?

What incentives or motivations would encourage you to utilize these outdoor recreation spaces?

Block 2

Thank you for completing the survey. The following page will redirect you to a new survey where you can enter the draw for prizes (2 lululemon yoga mats and 4 UBC Athletics Prize Packs).

You will need our group number to enter the draw - GROUP 10