

UBC Social Ecological Economic Development Studies (SEEDS) Sustainability Program

Student Research Report

**Staff and Student Satisfaction of Shared Spaces in**

**The Centre for Interactive Research on Sustainability (CIRS)**

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### Executive Summary

Finding the right balance between shared and private spaces is an important factor to consider for offices and universities not only to increase worker productivity, but also to increase overall satisfaction. In the current study, we investigate the differences in staff and student satisfaction between shared and private spaces in the Centre for Interactive Research and Sustainability (CIRS) and the factors that drive those preferences. To gather our data, we survey staff and students on the 2nd and 3rd floors of the CIRS building. Our results found that students are significantly more dissatisfied with the amount of private space compared to shared space in the building, and those who are dissatisfied are weakly correlated with private, non-collaborative use of the area. However, we didn't find significant differences between the level of satisfaction of the spaces among staff. Furthermore, the staff who were more satisfied with the amount of shared space were correlated with more collaborative use of the area. Based on the results, we recommend that a combination of both shared and private space would be optimal for increasing staff and student satisfaction, with a greater emphasis on private spaces.

## INTRODUCTION

Over the last few decades, open concept offices have become an increasingly popular alternative to traditional private offices or cubicles. Many businesses prefer this layout due to a variety of factors, including greater ease of interaction with others, increased occupant density, and a more unified, interconnected work environment (Kim & de Dear, 2013). The open concept layout aims to maximize the use of open space by positioning desks or furniture in such a way to promote collaboration. The traditional, private offices or cubicles have closed off areas, which tends to create a greater sense of privacy and isolation from others.

While there appears to be many advantages of the open concept layout, there exists a large body of literature indicating the harmful effects of this design. A study by Kim & de Dear (2013) found that open concept offices led to more distractions and poorer work performance, with approximately half the employees reporting lack of privacy as their biggest concern. A systematic review in 2011 found that while an open concept design created a sense of organizational mission and a relaxing environment, the space was also detrimental to worker productivity, creative thinking, and overall satisfaction (Hodgkinson & Ford). A major risk factor of open concept offices is the potential for greater cognitive overload (Hodgkinson & Ford). Cognitive overload occurs when “individuals are subject to excessive social interactions or distractions, which cause them to become overloaded” (Hodgkinson & Ford, 2011, p.199). Thus, given the nature of open concept offices, individuals who are sensitive to stimulation or who are unable to block out the distractions will have adverse consequences. A longitudinal field study found exactly this, with employees in an open concept office reporting increased dissatisfaction, increased stress levels and a lower perceived job performance (Brennan, Chugh & Kline, 2002).

Within the Centre for Interactive Research and Sustainability (CIRS) building at the University of British Columbia (UBC), there are many different types of spaces. On the 1st to 4th floors, there are “shared spaces”, which aims to maximize space by arranging chairs or furniture to promote interaction and collaboration. These are located inside the department offices and in the open areas outside the department offices. In addition, there are also “private spaces”, which are enclosed offices or cubicles that tend to promote privacy or isolation. These are located inside the department offices closed off from students. While there are some private spaces within the department offices, the majority of the areas in CIRS are shared spaces, therefore, there seems to be an imbalance between the types of space available.

The primary question we chose to investigate looked at what the differences in satisfaction of shared versus private spaces of staff and students were. In addition, we explored the underlying factors that drive their penchant towards these spaces. Given the amount of literature showing the negative effects of working in an open concept environment (Kim & de Dear, 2013), we wanted to explore this issue more specifically in the CIRS building. While there is a great deal of literature showing the negative effects of the open concept layout for workplaces or businesses, there tends to be a lack of literature on this topic for students. Therefore, we thought the CIRS building would be an opportunity to analyze both staff and student satisfaction of private and shared spaces due to the considerable amount of collaborative spaces in the building. Since the CIRS building is built to facilitate greater collaboration as opposed to privacy, we hypothesize that students and staff will be less satisfied with the amount of privacy in CIRS. We also wanted to know whether the level of satisfaction would be linked to

the intended use of the space. Therefore, we predict that the level of satisfaction of shared and private space will be negatively correlated with the intended use of the space.

## **PARTICIPANTS**

The sample consisted of 55 participants: 37 UBC students and 18 UBC staff members. Participants were recruited from level 2 and 3 of the Centre for Interactive Research of Sustainability Building at the University of British Columbia in Canada. All participants gave informed consent prior to completing the survey. The conditions were student and staff working on level 2 and 3 of the CIRS building. Demographics of the participants were not recorded.

## **MEASURES**

We used an online survey platform, SurveyMonkey, to collect participant responses. The survey consisted of a total of 9 questions: 8 multiple choice and 1 open ended question (see Appendix A). Satisfaction related questions were rated on a Likert scale from “Very Satisfied” to “Very Dissatisfied” for how well each statement described the participants’ attitude. When the satisfaction related questions were analyzed, the scales were converted to a numerical scale from 1 to 4 (1 = very dissatisfied, 4 = very satisfied) to allow for interpretation. Preference related questions, were given pre-made options to choose from and were analyzed as it was.

The results were hand analyzed on Microsoft Excel by extracting data that was relevant to each hypothesis. For hypothesis one, the dependent t-test was used to compare the satisfaction level means between collaborative spaces and private spaces for each identification group. For hypothesis two, Pearson’s correlation coefficient was used to examine the underlying mechanisms that drive the participants’ preferences.

## **PROCEDURE**

Researchers went into the CIRS Building on four separate days of March 12th, 13th, 20th and 22nd from 12 to 2pm to collect participant responses for the online survey. Researchers first approached participants in the CIRS building on the second and third levels to ask whether they would be interested in completing a short 3 to 5 minute survey, regarding the CIRS spaces. Once participants confirmed, they were given a computer, provided by the researchers, to complete the survey. For remuneration, pieces of chocolate were offered following their completion. Once the data was collected, the results were converted and analyzed using Microsoft Excel.

## **RESULTS**

Since this study was a between-subjects design, a dependent t-test was used to test hypothesis one. The test compared means of the student and staff samples independently of one another. Appendix B compares the students’ mean satisfaction with collaborative spaces (mean = 3, standard deviation = 0.5774) to their mean satisfaction with the private spaces in CIRS (mean = 2.6757, standard deviation = 0.5299). The dependent t-test revealed that the difference between the students’ means had a p-value of 0.0017, which was less than the standard alpha value of 0.05. Thus, these results are statistically significant and support hypothesis one. Appendix C compares the staff sample’s mean satisfaction with collaborative space (mean = 3.0556, standard

deviation = 0.6391) to their mean satisfaction with the private spaces in CIRS (mean = 2.944, standard deviation = 0.8024). A dependent t-test was also conducted for this data. The resulting p-value was 0.6073, which is greater than the alpha value of 0.05, suggesting that the results may be due to chance. While the staff results support hypothesis one, they are not statistically significant. Overall, our findings from both samples support the hypothesis that students and staff are generally less satisfied with the private space in CIRS. This makes sense as the area of study in CIRS is generally built with collaboration and sharing in mind, not privacy. Thus, it is valid that staff and students would feel CIRS doesn't satisfy they're private space needs. We further suggest this lower satisfaction with private space means they would prefer more private spaces.

To analyze data for hypothesis two, the qualitative data from the survey was converted to quantitative data. The net level of satisfaction for each participant was calculated by subtracting their satisfaction score of private spaces (1 to 4) from their satisfaction score for the collaboration spaces (1 to 4). Therefore, the resulting net score could be either a negative value, indicating higher satisfaction for the private space (lower satisfaction with collaborative; prefer more collaborative space); a positive value, indicating higher satisfaction for collaborative space (lower satisfaction with private space; prefer more private space); or a zero value, indicating equal satisfaction for both types of spaces. The intended use of space was scored on a scale from 1 to 3. One indicating private working/studying, two indicating other (i.e. leisure, waiting for class, eating), and three indicating collaborative studying/working. Afterwards, Pearson's r correlation coefficient was calculated. Appendix D shows the corresponding scatter plot for the student sample. It has a negative correlation coefficient of -0.1710. This correlation, though very weak, does support our second hypothesis that net satisfaction and use of space will be negatively correlated (private working/studying {1} correlated with lower satisfaction for private space or higher satisfaction for collaborative space {positive value}). Appendix E is scatter plot for this data corresponding to the staff sample. Conversely, it has a weak positive correlation coefficient of 0.3692. This correlation fails to support our second hypothesis; instead suggesting that higher satisfaction for collaborative space is correlated with collaborative studying/working.

In summary, we find that both hypotheses are supported by the student sample, but only hypothesis one is supported by the staff sample.

## DISCUSSION

According to the results, we found that the student satisfaction levels of the private spaces in the CIRS building was significantly lower than that of shared spaces. However, the difference of satisfaction for staff was not significant. In addition, we found that on average, students have a lower satisfaction with the amount of private spaces compare to that of the staff, while the satisfaction with the amount of shared space between students and staff are almost the same. Furthermore, the students who are dissatisfied or have no satisfaction difference with the amount of private spaces show a weak negative correlation and spend more time using the space for private work. In contrast, the staff who are dissatisfied or have no satisfaction difference with the amount of private spaces, are correlated with using the spaces for collaborative work.

There are several limitations with our study. First, the staff sample is too small and is not balanced with the student sample. We had 37 student participants respond to our survey, but only 18 staff participants. The relatively small sample of staff suggests low external validity. Our results thus suffer the risk of greater variation and being more extreme sample mean not

representative of the population. Moreover, that would make the comparison of the results between students and staff less reliable. We suspect that part of the reason that our results from the staff do not support hypotheses one is because of its relatively small sample size. Secondly, another limitation is that our study makes the assumption that all the staff regularly use the public area of the second and the third floor of the building. However, while distributing the survey, some staff interactions suggested that they do not use the public area. Suggesting their opinions may be less valid and bias, their results could further weaken the opinions of the staff who actually use the public area. Thirdly, instead of asking directly, we assume that a higher satisfaction for the amount of shared space rather than private space infers dissatisfaction of amount of private space. We further infer this dissatisfaction as meaning a preference/need for private space. However, having a lower satisfaction with the amount of private space doesn't necessarily mean that they are dissatisfied with the amount of private space.

On the other hand, there are some important implications for our study. We found that students are more likely to use public area in the CIRS building for private study. Moreover, from the dissatisfaction of the amount of the private spaces compare to that of shared spaces, we found that arrangement of the public area in the CIRS building is not balancing the demand of shared and private spaces for students. From the study, we can also infer that when considering the arrangements of other buildings which are mainly student-filled, more private spaces should be arranged. Besides private spaces, we also find that students have a great need for electric outlets, as 45.59% of students mention it. Furthermore, CIRS also needs to ensure that they have more and larger tables for staff as they spend more time in public space for collaborative working. In general, what does seem unanimous among staff and students is more efficient use of the space to allow for productive work. For example, more power outlets, more workspace (number of tables and chairs decreases as you escalate the building), and noise reduction. Therefore, the separating the space for students and staff with their specific needs could yield greater efficiency. It could also reduce conflicts between students and staff and increase the satisfaction and productivity for them.

In the future, a study with a larger sample and having a better control of the use of the area, like weighting the results by the amount of time that the student or the staff using the public area can be done to obtain a more confident finding for the satisfaction of both students and staff, and to clarify the factors that drive those levels of satisfaction. Another future study could look at the preference of the use of students and staff in terms of the public area with a more objective method, like conducting an observational study to see whether students spend more time doing private study verse staff doing more collaborative work.

## RECOMMENDATIONS

Based on what we learned, we recommend the construction of an island/bar-style space with built-in electrical outlets in the long, open corridor area on the 2nd floor, freeing up the area adjacent to the food preparation station for lunch eaters and collaborators. This feature would create useful space of the relatively underused existing space and draw students who prefer to work privately (who would ordinarily work in the collaborative area) to this area. It could easily double as a collaborative space as well, if needed. We were unable to find existing designs that exactly reflected this vision, but we would be happy to meet with the client and a designer to draw plans for it. See Appendix F which includes photographs of the closest depictions of we

could find of the design we have in mind. We would recommend a combination of the two layouts pictured, constructed with sleek materials that match the existing décor in CIRS.

Along with adding the island for laptop use, we recommend the use of round tables only in the area near the food preparation station that are more conducive to eating, not laptops. This would nudge people to eat and collaborate here, rather than work privately on their laptops.

The existing literature on choice architecture, defined as “the design of different ways in which choices are presented to people” (Zhao, 2018), helped us form the basis of potential solutions to optimizing the 2nd and 3rd floors of CIRS. In their 2013 paper, Thaler, et al. revealed that behaviour can easily and significantly be influenced without the need to make signs, laws, bans, or use other more forceful methods. They suggest that “nudges” can be very effective tools and they point to the example of a school cafeteria experiment which found that foods are more likely to be eaten if displayed at the beginning or end of the line than those in the middle, and foods displayed at eye level are more likely to be chosen than those in less convenient locations. The “choice architect” then has the option of placing foods in such a way as to make the most profit, encourage healthier choices, or maintain the status quo (Thaler et al., 2013).

Wu et al. (2013) provide empirical evidence that supports the legitimacy of choice architecture in their study done, interestingly, in the CIRS building. They confirmed that surroundings can have a profound and positive impact on behavior and they furthered the argument that a bridge between psychology, design, and policy-making can be fruitful in the design of the human environment (Wu et al., 2013). The implications of our study are that the effectiveness of these methods is already supported right here at UBC in the same building. Nudges can serve as appropriate solutions to problems in university environments like UBC’s because they are liberty-preserving approaches that steer people in particular directions, but that also allow them to go their own way (Zhao, 2018).

We believe the choice architecture and nudges we have suggested in this report will help improve the satisfaction of both students and staff in the 2nd and 3rd floors of the CIRS building. If optimum well-being is the goal, these ideas represent solutions for bringing the shared and private spaces into balance in such a student-staff mixed environment.

## References

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## Appendix A

## Survey

CIRS “shared spaces” consists of the open areas on the 2nd and 3rd floors, which is used by both staff and students. This excludes the open meeting area inside the department offices.

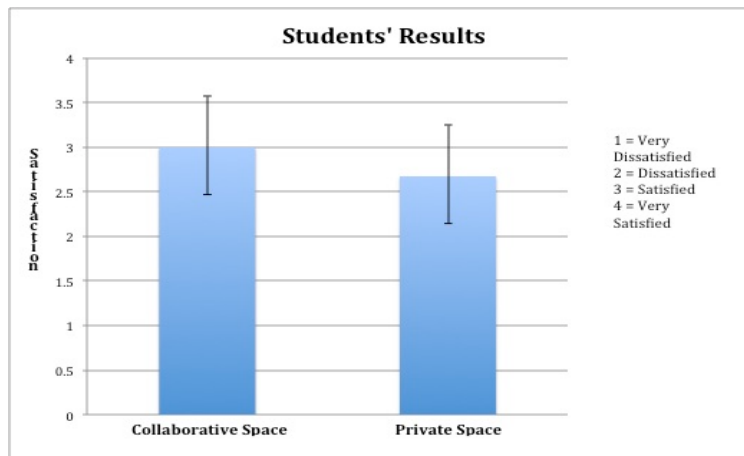
1. Which do you identify as?  
 Staff  Student
  
2. How would you describe your level of overall satisfaction working/studying in the CIRS building?  
 Very Dissatisfied  Dissatisfied  Satisfied  Very Satisfied
  
3. How would you describe your level of satisfaction with the amount of **shared space** in the CIRS building?  
 Very Dissatisfied  Dissatisfied  Satisfied  Very Satisfied
  
4. How would you describe your level of satisfaction with the amount of **private space** in the CIRS building?  
 Very Dissatisfied  Dissatisfied  Satisfied  Very Satisfied
  
5. How do you spend the majority your time in CIRS?  
 Collaborative Studying (i.e. working on projects)  
 Leisure time  
 Private Study/Work  
 Eating  
 Other \_\_\_\_\_
  
6. What area do you generally prefer to work in at CIRS? Please mention which floor, the general area of the table and the location of the table relative to the area. [ie: 3<sup>rd</sup> floor, small round table, near corner]? \_\_\_\_\_
  
7. CIRS is efficiently laid out in terms of spacing, amount of tables, and the size of tables.  
 Strongly Disagree  Disagree  Agree  Strongly Agree
  
8. Are there any reasons preventing you from regularly studying/working on the 2nd or 3rd floor of CIRS? (please check all that apply)  
 Lack of electrical outlets  
 Noise  
 Lighting  
 Lack of tables  
 Lack of private space  
 Lack of shared space  
 Nothing preventing me  
 Other (please specify) \_\_\_\_\_
  
9. If there is one thing you could change about the CIRS 2nd and 3rd floor study areas, what would it be? \_\_\_\_\_



## Appendix B

## Students' Results

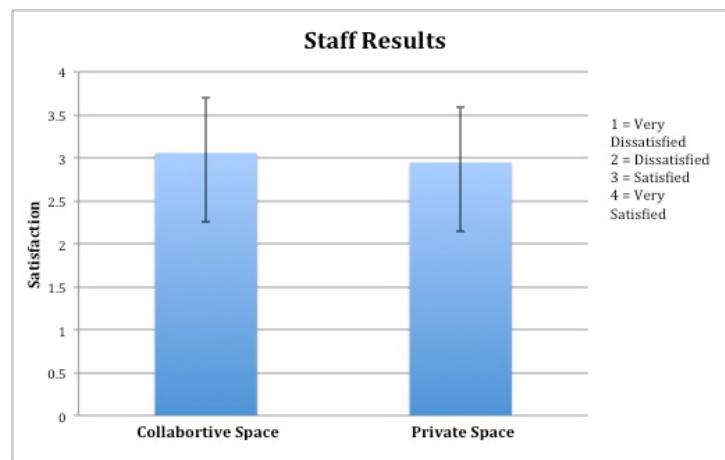
Students' satisfaction of shared spaces (mean = 3, standard deviation = 0.5774) compared to satisfaction private spaces (mean = 2.6757, standard deviation = 0.5299). P-value of 0.00167, thus a statistically significant difference.



## Appendix C

## Staff's Results

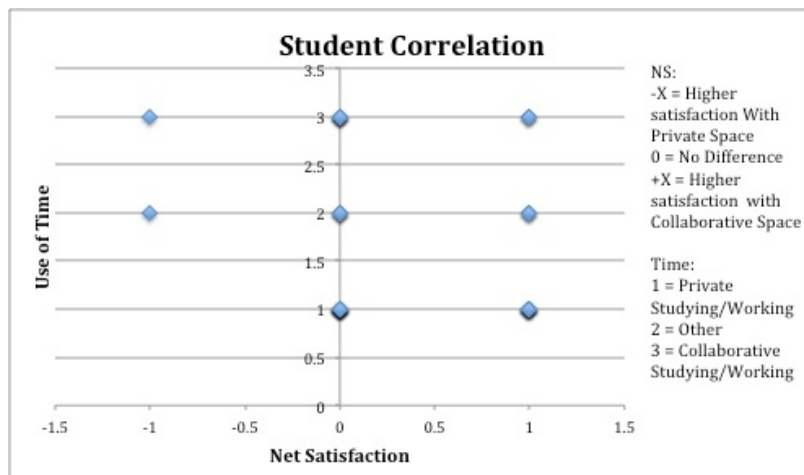
Staff satisfaction of shared space (mean = 3.0556, standard deviation = 0.6391) and private spaces (mean = 2.9444, standard deviation = 0.8024). P-value of 0.6073, thus not a statistically significant difference.



Appendix D

Scatterplot for Student Correlation

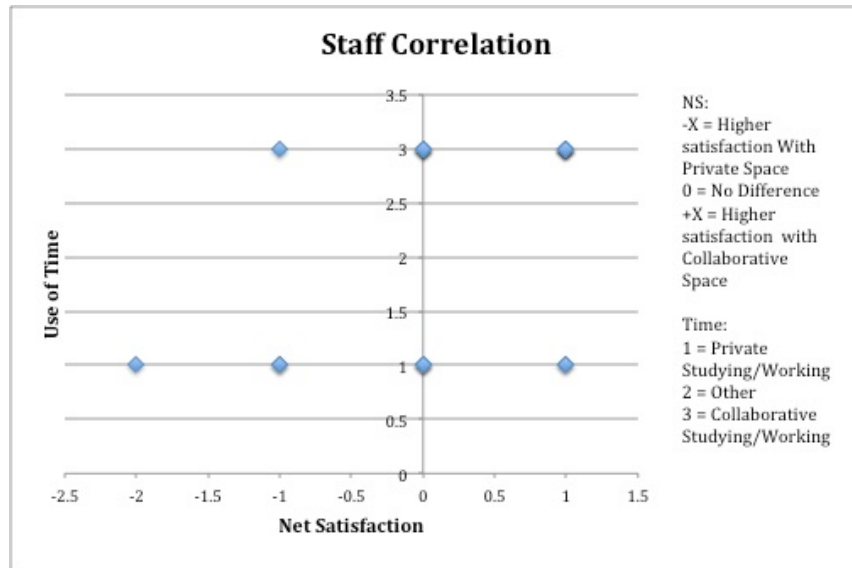
Student correlation net satisfaction vs use of time. Negative correlation of -0.1710. Positive net satisfaction (more satisfied with shared spaces) has low use of time (private working/studying).



Appendix E

Scatterplot for Staff Correlation

Staff correlation net satisfaction vs use of time. Positive correlation of 0.3692. Positive net satisfaction (more satisfied with shared spaces) has high use of time (collaborative working/studying).



Appendix F

Stock Photographs/Examples of  
Recommended Island/Bar for 2<sup>nd</sup> Floor of CIRS



Photo credit: azuremagazine.com



Photo credit: ausbt.com.au