Science Students' Council
Research & Policy Committee
Conceptual and Procedural Recommendations for Student Space Design

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Introduction

Well-planned physical learning environments have a positive impact on student productivity, social connectedness, learning, achievement, well-being and mood[1]. The importance of well-designed spaces is crucial for student success and happiness for students at Western University. Many Canadian universities, including Dalhousie University, University of British Columbia, and Simon Fraser University, currently use student feedback to inform the development and design of new student spaces[2]. Student collaboration makes students feel more included and can positively impact their perception and attitude towards the faculty itself.

The purpose of this paper is to provide actionable input on the design of future student spaces and to organize a dissemination plan to involve student perspectives into the design and planning process. The following recommendations are informed by evidence-based student space design principles[3] and a 2016/2017 University Students' Council (USC) report on student space design[4].

The report is divided into two sections:

1. **Conceptual Basis**: an overview of current research on student space design principles. Decisions regarding which specific design principles to focus on were informed by group discussions hosted by the SSC.
    a. *Study Spaces*
    b. *General Student Spaces*
    c. *Materials & Resources*
2. **Procedural Recommendations:** describes the specific steps that may be taken to engage the Western Science student body in the planning of new spaces, using examples from other Western faculties and Universities.
    a. *Small Projects*
    b. *Large Projects*
    c. *Science Student's Donation Fee*

Section 1: Conceptual Basis

[1] Black, T., Dhaliwal, R., Stanton, A., and Hutchison, C. (2014). A Rationale to Address Physical Spaces and Well-being in Post-Secondary Settings. Retrieved from www.sfu.ca/content/sfu/healthycampuscommunity/physicalspaces/_jcr_content/main_content/download/file.res/Physical%20Spaces%20Rationale.pdf

[2] Bouevitch, N. (April 8, 2017). Campus spaces designed by students. The Globe and Mail. Retrieved from www.theglobeandmail.com/news/national/education/canadian-university-report/campus-spaces-designed-by-students/article32408377/

[3] Research and Policy Committee. (2017). Report on Student Space Design NCB Second Floor Renovation Project. Retrieved from static1.squarespace.com/static/591921719f74568eef60c2f2/t/5a48376b0d92977993f75ead/1514682220864/SSC-Student-Space-Report.pdf

[4] Academia Group. (2017). Western USC Strategic Planning Survey. University Students' Council.

Principle: Student spaces are vital components of campus infrastructure that facilitate student interaction and allow completion of important academic tasks.

Concern: Western University students feel study and student lounging space needs improvement on campus.

Recommendation: Constructing multipurpose spaces, with independent and group work configurability mitigates the need for both study and student space improvement.

Recommendation: Using appropriate furniture and décor, such as the inclusion of artistic elements or interior design features can create an inviting atmosphere in student lounge spaces.

Recommendation: Technological integration in both study and student lounging spaces can be achieved by providing accessible internet connection, charging ports, and digital display systems.

Study Spaces

Study spaces are a vital part of the campus infrastructure, enabling students to complete important academic tasks on campus. According to the USC survey, 57% of students felt that study space availability needed improvement and 36% felt that student lounging/socializing space availability needed to be improved[5]. This suggests multipurpose spaces, which incorporate both study and lounging space, may be more beneficial due to students wanting improvements in both study and general student space availability. These multipurpose spaces can include both open study spaces and study rooms. Open spaces allow for both individual and group-based studying, and are more easily implemented in new student hubs. Study rooms should be bookable spaces, as is currently the case for Western library study rooms, enabling students to plan their usage of the space in advance.

Within open study areas, it's important to minimize the risks of congestion. Using reconfigurable furniture, such as chairs and tables that can be easily moved and/or reconfigured, enables customization of the study room to meet the needs of different group sizes[6,7]. In addition, large-capacity tables allow for simultaneous use by multiple groups, whereas smaller-capacity tables are often only used by one individual – even if the smaller-capacity table could accommodate more people, once one person is using the table other students deem that space not fit for use and look elsewhere. Ambient noise can also impact usage of an open study space, highlighting the importance of having multipurpose study areas that include both study rooms, study carrels for quiet study space and open common lounges for moderate ambient noise[8].

[5] Academia Group. (2017). Western USC Strategic Planning Survey. University Students' Council.

[6] Hobbs, K., and Klare, D. (August 27, 2010). User Driven Design: Using Ethnographic Techniques to Plan Student Study Space. *Technical Services Quarterly.* Retrieved from www.tandfonline.com/doi/abs/10.1080/07317131003766009?journalCode=wtsq20

[7] Fox, R. and Doshi, A. (2013). Longitudinal Assessment of "User-Driven" Library Commons Spaces. *Evidence Based Library and Information Practise.* Retrieved from journals.library.ualberta.ca/eblip/index.php/EBLIP/article/view/19544

[8] Painter, S., Fournier, J., Grape, C., Grummon, P., Morelli, J., Whitmer, S. et al. (2012). Research on Learning Space Design: Present State, Future Directions. Society on College and University Planning. Retrieved from www.scup.org/page/resources/books/rolsd

Technological integration is a key feature for study areas and could be implemented in the form of projectors or monitors that enable students to display their work[9]. Additionally, outlets should be accessible from most seated areas, with charging ports present at each table. Relevant adapters that students would use to connect their computers to these digital display devices, such as HDMI and mini-display port adapters, should also be provided.

General Student Space

The primary function of a general student lounge space is to provide a welcoming area where students feel comfortable to socialize and spend downtime. Lounge spaces also enable casual, 'coffee-shop style' studying. To encourage talking and a lively atmosphere, the furniture should be colorful, varied and comfortable[10]. It should include flexible furniture, including moveable chairs and tables, whose layout can be freely changed by students in order to accommodate individual and group-based study preferences. Additionally, the space should feel open and be easily accessible from high-traffic portions of the building. General student spaces should accommodate technological needs, providing access to power outlets, a reliable internet connection[11, 12, 13], media players/projectors and phone charging stations, which have been integrated successfully at other schools such as York University, Ryerson University, and the University of Toronto[14].

Atmosphere plays a vital role in determining the use of a space. Students prefer a space that feels homely rather than "sterile and institutional," and this preference is reflected in utilization of student spaces[15, 16]. Students report that an inviting atmosphere can be achieved through décor, such as the inclusion of artistic elements or interior design features such as indoor plants[17].

Inclusion of eating-friendly areas should also be considered, as they contribute to the warm feel of the space and support studying and lounging functions[18]. Microwaves should be incorporated into eating-friendly areas, as they allow students to bring hot meals from home.

Materials and Resources

[9] Painter, S., Fournier, J., Grape, C., Grummon, P., Morelli, J., Whitmer, S. et al. (2012). Research on Learning Space Design: Present State, Future Directions. Society on College and University Planning.

[10] Doshi, A., Shilpi, K., and Whitmer, S. (December, 2014) Does Space Matter? Assessing the Undergraduate "Lived Experience" to Enhance Learning. *Planning for Higher Education Journal*. Retrieved from https://smartech.gatech.edu/handle/1853/52648

[11] Hobbs, K., and Klare, D. (August 27, 2010). User Driven Design: Using Ethnographic Techniques to Plan Student Study Space. *Technical Services Quarterly*.

[12] Rempel, H. G., Hussong-Christian, U., and Mellinger, M. (December 2011). Graduate Student Space and Service Needs: A Recommendation for a Cross-campus Solution. *The Journal of Academic Librarianship*. Retrieved from www.sciencedirect.com/science/article/abs/pii/S0099133311001583

[13] Painter, S., Fournier, J., Grape, C., Grummon, P., Morelli, J., Whitmer, S. et al. (2012). Research on Learning Space Design: Present State, Future Directions. Society on College and University Planning.

[14] (September 25, 2013). YFS sets new charging stations. *Excalibur*. Retrieved from http://excal.on.ca/yfschargers/

[15] Hobbs, K., and Klare, D. (August 27, 2010). User Driven Design: Using Ethnographic Techniques to Plan Student Study Space. *Technical Services Quarterly*.

[16] Painter, S., Fournier, J., Grape, C., Grummon, P., Morelli, J., Whitmer, S. et al. (2012). Research on Learning Space Design: Present State, Future Directions. Society on College and University Planning.

[17] Hobbs, K., and Klare, D. (August 27, 2010). User Driven Design: Using Ethnographic Techniques to Plan Student Study Space. *Technical Services Quarterly*.

[18] Doshi, A., Shilpi, K., and Whitmer, S. (December, 2014) Does Space Matter? Assessing the Undergraduate "Lived Experience" to Enhance Learning. *Planning for Higher Education Journal*.

In addition to carefully planning the overall layout of a space, it is vital to consider the specific design components that a space requires, ensuring that students are equipped with the resources they need to facilitate and enhance their learning.

Academic resources such as whiteboards can act as highly effective learning tool. Wall-mounted whiteboards, whiteboard tables, and rolling whiteboards encourage students to consolidate their thinking in a flexible manner[19]. Students can use the whiteboards collaboratively to work with group members and share ideas.

Section 2: Procedural Recommendations

Principle: Including student input in the design process of student spaces enables those spaces to be better tailored to students' preferences and can improve overall use of the space.

Principle: A large proportion of Western students feel study and student space availability needs improvement on campus.

Principle: Major Canadian Universities and other faculties at Western are including student feedback in the design of student spaces.

Concern: Currently, the Faculty of Science does not have robust policies regarding the incorporation of student feedback in the planning of new student spaces.

Recommendation: For small projects, contact the SSC and departmental clubs 1-2 years before project finalization in order to create an effective survey, approved by Faculty of Science administration, and assimilate student feedback.

Recommendation: For large projects, organize student referendums and town halls to facilitate discussion surrounding new student space.

Recommendation: SSC may allocate a donation from the Legacy Fund towards proposed student spaces in order for more involvement and feedback in the design process.

Small Projects

A recent 2016/2017 University Student Council (USC) Strategic Planning Survey, found that 57% of students felt that study space availability needed improvement and 36% felt that student lounging/socializing space availability needed to be improved[20]. With other Canadian Universities beginning to integrate student input into space design, such as University of British Columbia, Dalhousie University and Simon Fraser University[21], Western has the opportunity to collaborate with the student population to construct similar spaces at Western.

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[19] Zevenbergen, R., and Lerman, S. (March 7, 2017). Learning environments using interactive whiteboards: New learning spaces or reproduction of old technologies? *Mathematics Education Research Journal*. Retrieved from link.springer.com/article/10.1007/BF03217471

[20] Academia Group. (2017). Western USC Strategic Planning Survey. University Students' Council.

[21] Bouevitch, N. (April 8, 2017). Campus spaces designed by students. The Globe and Mail.

Current Examples

In 2015, the Undergraduate Engineering Society (UES) at Western was contacted to provide student feedback to inform the creation of a new student space in the upcoming ThreeC+ Engineering building[22]. UES distributed a survey probing student preferences for lecture hall space, tutorial space, private and open study space, design studios, eateries and 24-hour accessibility[23]. The survey was completed by almost 50% of the Undergraduate student population. Architects used feedback from the survey to inform their design, with representatives from the UES attending all architectural meetings to ensure the student feedback was being taken into consideration.

At other Universities, such as the University of Waterloo, the Arts Student Union released a survey in 2012 to receive feedback and opinions on the creation of new student space for the Faculty of Arts[24]. Receiving 1,455 responses (linked to a student name and identification number), their feedback informed the creation of an $8.35 million project[25]. Queen's University released a survey in 2015 to gather information on how students currently use student life spaces[26]. These results were used to inform the pillars of a new Student Life Space Plan Advisory Subcommittee (SLSPAS) and use student input when designing new spaces[27]. University of Toronto Scarborough Student's Association is currently promoting a student space survey, in order to highlight current space needs in order to advocate to the administration on behalf of the students[28].

Recommendation

The SSC should be involved in providing feedback and informing the design of new Faculty of Science student spaces. After being contacted, the Research and Policy Committee on the SSC will draft a survey based off consultations with the USC academia group, which created the 2016/2017 USC survey, and SSC members. This draft can be sent to the Faculty of Science administration for comments, concerns, and suggested changes. After editing, the survey will be disseminated to the student body. The SSC will promote the survey to the entire student body using the Department Representatives, social media, and in-person presence at busy Science student areas (e.g. Natural Science atrium, Allyn & Betty Taylor Library main floor). The Faculty of Science may also disseminate the survey through methods including e-mails to the student body. The survey results will be summarized and sent back to the faculty administration for use.

[22] (2018). Three C+: For Students. Western Engineering. Retrieved from http://www.eng.uwo.ca/threecplus/students.html

[23] Western UES. (2015). Western Undergraduate Engineering Study Space Survey. Retrieved from https://docs.google.com/forms/d/e/1FAIpQLScQyVQReiWlmMz5GtqE8oHzSsa6exVNaV5MqTux_1mvmUve_g/formResponse

[24] Livermore, S., and Genik, J. (2012). Arts Student Space Survey. Retrieved from https://uwaterloo.ca/arts/sites/ca.arts/files/uploads/files/Arts-Space-Survey-Detached.pdf

[25] Arts News. (April 24, 2017). The story of the hub. University of Waterloo. Retrieved from uwaterloo.ca/arts/news/story-hub

[26] Leroux, C. (February 18, 2015). Survey will help improve student life space. *Queen's Gazette*. Retrieved from www.queensu.ca/gazette/stories/survey-will-help-improve-student-life-spaces

[27] Leroux, C. (October 9, 2014). New committee to develop a student life space plan. *Queen's Gazette*. Retrieved from www.queensu.ca/gazette/stories/new-committee-develop-student-life-space-plan

[28] (2018). Academic Advocacy. Scarborough Campus Student Union. Retrieved from www.scsu.ca/campaigns/acadsemicadvocacy/

Similar to Western UES protocol, the SSC may follow-up to ensure that the student feedback is being used in the design process. SSC recommends the Faculty of Science administration creates a long-term involvement plan, which may include follow-up meetings with the SSC or relevant departmental clubs. These long-term plans ensure the student opinion is being valued and will foster a collaborative culture surrounding the new student space.

When new spaces are being created in areas that will be accessed primarily by a small number of departments, SSC suggests contacting individual departmental clubs. This ensures feedback is representative of the population that will be using the space. The individual clubs can decide how to assimilate feedback, and/or contact the SSC to collaborate on a survey.

The following departmental clubs may be contacted to receive department-specific feedback:

Department Club	Contact Information
Actuarial and Statistical Undergraduate Association (ASUA)	facebook.com/ASUAUWO
Bachelor of Medical Sciences Association (BMSA)	bmsawestern@gmail.com
Biophysics Network of Students (BONeS)	bones@uwo.ca
Biology Undergraduate Society (BUGS)	westernbugs@gmail.com
Chemistry Club	uwochemistryclub@gmail.com
Computer Science Undergraduate Society (CSUS)	csus@uwo.ca
Environmental Science Student Association (EnSSA)	envirowestern@westernusc.ca
Microbiology and Immunology Student Association (MISA)	misauwo@gmail.com
Outcrop Club (Geology/Geophysics)	uwooutcrop@gmail.com
Physics and Astronomy Student's Association (PASA)	westernpasa@gmail.com
Undergraduate Genetics Association (UGA)	undergradgenetics@gmail.com
Western Biochemistry Club (WBC)	westernbiochemistryclub@gmail.com
Western Pathology Association (WPA)	wpa@schulich.uwo.ca
Western Undergraduate Neuroscience Society (WUNS)	western.neuroscience@gmail.com

Survey Timeline

For survey-based feedback, the Science Student's Council recommends contacting the SSC and departmental clubs 1-2 years ahead of design and architectural plan finalization. This timeline is typically used at Western and other universities. For example, Western UES released their survey a year ahead of final design development of the ThreeC+ Building[29] and the

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[29] (2018). Three C+: For Students. Western Engineering.

University of Waterloo's Arts Student Union survey was released 2 years before construction began[30].

Survey Integrity

In order for survey results to be an accurate representation of student feedback, there are some methodological considerations. All discussed examples of University student space surveys, except for Western UES, used student identification numbers to track survey responses. The SSC will use Western student numbers as a way to track survey responses and ensure high data quality (for instance, by preventing one student from submitting multiple survey responses). Student names will not be associated with their student number or survey responses. This will be stated in the survey in order for students to understand their anonymity. This ensures participants do not alter answers for social desirability or for fear of academic repercussions[31]. Providing the Faculty of Science administration with a survey draft before publication adds an additional level of certification regarding the survey's integrity.

The majority of questions will be multiple choice, providing easier interpretation of survey data. Some questions may include short answer options; in these instances thematic coding analysis can be used to extract key themes from student responses. A study by Poggiali and Cohen (2014) provides a list of 'issue codes' specific to a library space (i.e. Outlets, Furniture – Chairs, Furniture – Study Carrels, Noise) which will be used as a resource for the analysis[32]. In addition, survey questions must be void of biases. Careful wording of questions will ensure there are no leading questions which could result in measurement errors.

After data extraction and analysis, the results will be summarized into a written report and submitted to the Faculty of Science administration. Results may be presented in an infographic for distribution to the student body in order to maintain transparency, a pillar of the SSC and Faculty of Science.

Large Projects

For projects deemed to be larger-scale by the Faculty of Science (due to considerations such as financial magnitude and anticipated student impact), several Canadian universities used referenda, city halls and interviews to receive student input and collaborate with students at a heightened level[33]. These large student spaces will act as central hubs for student activity (similar to the University Community Centre). For example, the Dalhousie Student Union Building planned interviews, public meetings and feedback sessions with the student community for 2 years ahead of construction[29, 34]. The University of British Columbia's USC-equivalent and student-run committee made all decisions involving the $107-million CAD student centre[35]. In

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[30] Arts News. (April 24, 2017). The story of the hub. University of Waterloo.

[31] Stat Trek. (2018). Bias in Survey Sampling. Retrieved from stattrek.com/survey-research/survey-bias.aspx

[32] Poggiali, J., and Cohen, M. (2014). A low-hassle, low-cost method to survey student attitudes about library space. *Library Leadership & Management.* Retrieved from https://academicworks.cuny.edu/cgi/viewcontent.cgi?article=1003&context=le_pubs

[33] Bouevitch, N. (April 8, 2017). Campus spaces designed by students. The Globe and Mail.

[34] Visca, M. (May 8, 2015). Revitalizing Dal's student union building. Dal News. Retrieved from www.dal.ca/news/2015/05/08/a-revitalized-student-hub--student-union-building-renovations-ge.html

[35] Alma Mater Society. (2016). AMS Student Nest. University of British Columbia. Retrieved from http://www.ams.ubc.ca/wp-content/uploads/2014/08/AMS-Student-Nest_Press-Kit_Web.pdf

addition to a survey created by the Arts Student Union, the University of Waterloo held a town hall to inform the development of their new arts building[36].

Recommendation

SSC recommends the Faculty of Science administration plan, facilitate, and moderate the feedback sessions, potentially in conjunction with the SSC and/or departmental clubs. SSC and departmental clubs can promote the feedback sessions to the student population using social media in order to improve student attendance and participation. These feedback sessions a are likely to improve student enthusiasm regarding the new space, due to public acknowledgment that the student opinion is appreciated.

An example of a feedback session will include Faculty of Science representatives, the SSC, departmental clubs, and science students. There will be questions focused on how the Faculty of Science should improve student space, student preferences for amenities (i.e. microwave access, outlets) and types of study space (i.e. group study areas or individual study carrels, ambience level, outdoors light).

Timeline

The SSC recommends having large-scale feedback sessions 2-3 years ahead of design finalization due to discussion-based feedback being more difficult to extract and summarize. Additionally, this timeline was used at Dalhousie University[37].

Science Students' Council Donation

The SSC may allocate funds to proposed student spaces in order to be more involved in the design process. Any financial contributions from the SSC would likely come from the SSC's Legacy Fund, a fund that is put towards one major initiative each year. Student council financial contributions occurred with Western UES, in which a donation was made for a student space within the new building. This allowed UES representatives to choose furniture, meet with architects, and attend all meetings to ensure their survey feedback was taken into account. A student council donation also occurred at the University of Waterloo by their Arts Student Union[38], and at the University of British Columbia by their Alma Mater Union[39]. At the point of donation, SSC would expect a plan for their long-term involvement in the project, facilitated by the Faculty of Science administration. Finally, it should be noted that while the SSC is open to the possibility of funding, any decision regarding future financial contributions must be made by future members of the SSC; the current SSC members cannot pledge a future donation.

Upcoming Projects

[36] Arts News. (April 24, 2017). The story of the hub. University of Waterloo.
[37] Bouevitch, N. (April 8, 2017). Campus spaces designed by students. The Globe and Mail.
[38] Arts News. (April 24, 2017). The story of the hub. University of Waterloo.
[39] Alma Mater Society. (2016). AMS Student Nest. University of British Columbia.

The upcoming design and construction of the *Integrated Learning and Innovation Centre* (ILIC) presents an opportunity to collaborate with the student body and assimilate student feedback to inform the design of the new space. The ILIC will house many student-centered spaces such as smart classrooms, study spaces, and collaborative student areas[40]. Using feedback in the design process is vital since these spaces will be used primarily by students and should be tailored to student needs. Detailed planning of the ILIC will begin in 6 to 12 months[41], which provides time for a student survey to be created and distributed. Due to ILIC being a general institutional building and not faculty-specific, SSC may choose to collaborate with research representatives at the USC or Western Student Senators to collect student feedback.

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[40] (March 30, 2017). 2017-2018 Operating and Capital Budgets. Western University. Retrieved from www.ipb.uwo.ca/documents/2017_budget.pdf

[41] Jalowska, K. (March 14, 2018). Planning of new Concrete Beach development to begin within the year. Western Gazette. Retrieved from www.westerngazette.ca/news/planning-of-new-concrete-beach-development-to-begin-within-the/article_d38eaad0-22de-11e8-842d-af4753575148.html