Community engaged learning (CEL) in co-curricular student groups (full paper)

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Work-in-progress: Community engaged learning (CEL) in co-curricular student groups

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Abstract

Many engineering student groups engage in Community Engaged Learning (CEL). This study seeks to characterize these experiences through a survey assessing the types of activities students engaged in, skill development, challenges, supports used and the impact of COVID-19. The study targeted twelve student groups that were likely to be engaged in CEL. Responses were received from twelve students in six of the twelve targeted groups. Results indicate that students develop several skills through CEL work related to the Engineers Canada Graduate Attributes. All students indicated some challenges in their work. Students engaged with resources including past group members, faculty and transition documents, though no students indicated engagement with the campus' Centre for Community Engaged Learning (CCEL). COVID-19 presented logistical challenges and lessened engagement from both group members and community partners. This study showcases the value of CEL projects for student development as well as opportunities for further supporting students in seeking these opportunities.

Keywords

Community engaged learning, co-curricular, experiential learning

Introduction

Community engaged learning (CEL) can be defined as a type of experiential learning where students collaborate with members of the broader community in support of learning goals. Service learning can also be considered a type of CEL. One stakeholder framework for CEL projects in a university setting is that they serve three main stakeholders with these being the community, students and the university. CEL should provide value to the community partners by providing a benefit to their organization which can take a variety of forms. CEL should provide students an opportunity to apply the skills they are developing to a meaningful project. In terms of the university curriculum, CEL should provide opportunities for engagement and reflection on learning outcomes. The reflection piece is a key component of CEL and can be challenging to implement [1].

CEL has been shown to be highly impactful in shaping educational experiences of students in university [2], [3]. However, it can also be resource intensive, necessarily taking time and effort to cultivate community partners and establish strong relationships. These strong relationships are important to ensure the project will benefit all stakeholders in a meaningful way. Ensuring this is occurring can be difficult and there is a rich literature on critical service learning which examines these challenges [4]–[6].

Both University of British Columbia (UBC) Campuses have undertaken studies on experiential learning, including CEL [7], [8]. Both studies have recommended support to equip students, faculty and staff with competencies to respectfully engage community partners. Much of the previous literature on CEL experiences, including those in engineering, focus on course-based projects [9], [10]. There is relatively little literature focusing on co-curricular student groups and their engagement with CEL. With this in mind, this study seeks to understand current community engagement strategies used by engineering students in co-curricular student groups.

Methodology

A survey was selected as the best means of collecting data from a variety of members (executive and non-executive) within each student group. This method was chosen as the desired data could be obtained using a survey, and the survey format allowed a larger number of responses to be analyzed as opposed to using a technique such as interviews or a mixed-methods approach.

Methods

This study first assessed co-curricular student groups at the UBC Vancouver (UBCV) campus where engagement with the community was strongly aligned with the goals of the student group. Based on this assessment twelve groups were targeted for participation, with these groups described below:

1. Alpha Omega Epsilon – a professional sorority for women in engineering and technical sciences

2. Association of Chinese Canadian Engineering Professionals & Technologists (ACCEPT) – a non-profit connecting Chinese Canadians to and within engineering and promoting inclusiveness in the engineering and technology sector

3. Biomedical Engineering Student Team (BEST) – a student design team focusing on biomedical engineering applications

4. .caISES – an official chapter of the American Indian Science and Engineering Society (AISES), which is a non-profit organization focused on substantially increasing the representation of Indigenous peoples in Science, technology, Engineering and Math (STEM)

5. Engineers for a Sustainable World (ESW) – a group seeking environmental, social and economic prosperity created and sustained by local and global collective action.

6. Engineers Without Borders (EWB) – an international development non-profit

7. Gears and Queers – a social club for lesbian, gay, bisexual, transgender, queer + (LGBTQ+) STEM students

8. National Society of Black Engineers – supports and promotes the aspirations of collegiate and pre-collegiate students and technical professionals in engineering and technology

9. Sigma Phi Delta – a professional fraternity for men in engineering

10. Sustaingineering – motivates students to take action on global sustainability issues through technology

11. Wastenauts – an engineering design team that encompasses sustainability in engineering design and principles of a circular economy

12. Women in Engineering (WiE) – an organization promoting gender-diversity, equity and inclusion in engineering.

Survey questions can be found in Appendix A. The survey began with questions on the student groups the student was involved in, the timeframe of their involvement and their role. The survey then asked whether student group members were involved in CEL projects. For clarity students were told to use the definition for community as being any non-profit or government group external to UBC which has utilized and benefited from services provided by student volunteers (e.g.: schools, local government, community associations, advocacy groups, charities, community members, student groups in other universities, other non-profits). Depending on whether students had engaged in CEL projects the survey then branched into two tracks.

For those having been involved in CEL projects the survey asked about the types of activities they were involved in. It then asked about their individual role in the projects as well as the role of the community partner. Following this the survey inquired about several skills or experiences the CEL projects may build. This list of skills was developed in consulting a number of sources including the UBC Centre for Community Engaged Learning (CCEL) [11] and the Engineers Canada Graduate Attributes [12]. Students are asked about challenges to their work and support resources they have utilized, with this list being informed by CCEL. Finally, the survey asks how COVID-19 has impacted their CEL activities

The survey asked about strategies students used when developing CEL projects. If the members had not engaged in CEL projects, the survey questions focused on whether students were interested in pursuing CEL projects and what strategies would be used to pursue these anticipated projects.

The study received behavioural research ethics board approval prior to contacting research participants. Participants were contacted in August through messages delivered by email or social media to the executive teams at the twelve target groups. Messages were formatted in such a way that they could be passed on to other group members. Participation was incentivized with a draw for $20 gift cards with one of these gift cards drawn for every 5 participants.

Results and Discussion

Overall 12 complete responses were received. 17 partial responses were also received with many of these partial responses ending at question 5 corresponding to whether they had been involved in CEL projects, which also corresponded to the first page of the survey. Only the complete responses were included in the analysis of survey data.

Of the complete responses, half were from executive leaders and another half from group members. Respondents belonged to the following target groups with number of responses from a member of that group indicated. Note that some respondents belonged to more than one group: Alpha Omega Epsilon (2), Biomedical Engineering Student Team (BEST) (3), Engineers Without Borders (EWB) (2), Sigma Phi Delta (5), Women in Engineering (WiE) (2).

In addition, respondents also indicated they were members of the following groups: Engineering Undergraduate Society (1), Thunderbikes (1), UBC Rocket (1), UBC Unmanned Aircraft Systems (1).

Out of the 12 respondents, 8 had been involved in CEL projects in their student groups and 4 indicated they had not been involved in CEL. There was overlap between targeted student groups with participants from one student group indicating involvement in CEL, while others from the same student group indicating no involvement in CEL. One likely explanation for this is that sub teams within each group may engage or not engage in CEL. Further analysis is broken down into responses from students involved in CEL and not involved in CEL.

Respondents who had indicated they were involved in CEL in their student groups indicated their involvement in several activities in CEL including mentorship (5), event planning (4), technical design projects (2), workshop delivery (1), fundraising (1) and building projects for clients (1). The indicated roles of respondents generally corresponded with the types of activities they were involved in. The role of the community partner was typically in providing space, mentorship, a connection to other groups or an audience.

Through CEL students rated the development of certain skills with the results of this self-assessment in Figure 1. Note the descriptions on the bar chart are abbreviated and full prompts for each of these can be found in the survey questions in appendix A. Given the variety of projects, different skill development can be seen. However, all experiences related to developing skills in teamwork as well as in ethics, accountability and equity. Several students noted development of communication and economics and project management skills as well as developing further understanding of an engineer's role and responsibility in society and addressing community experiences through engineering activities. Students also indicated the development of leadership skills, completion of projects with little oversight and interaction with a "diverse range of people".
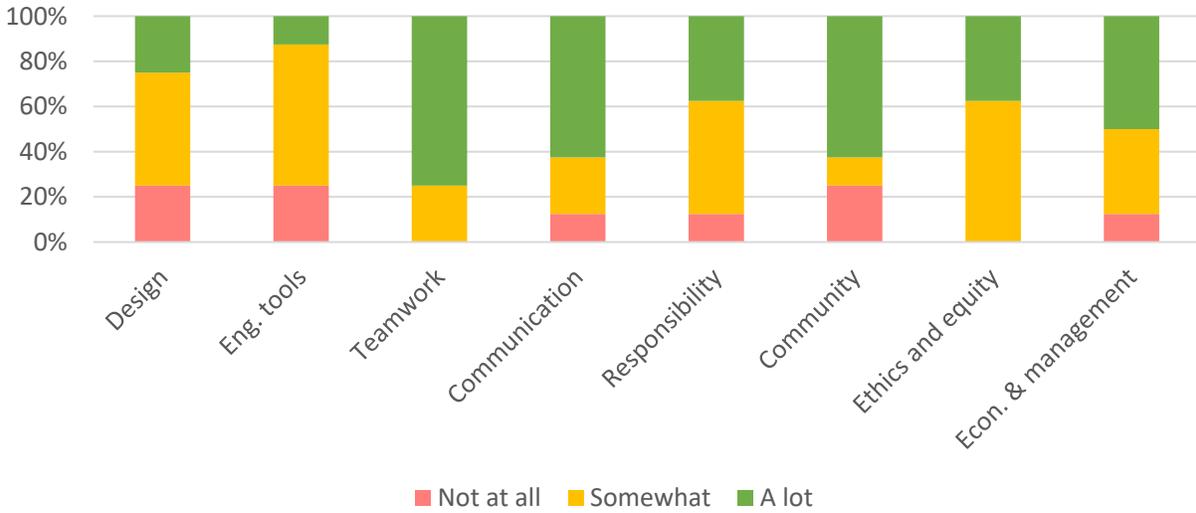
Figure 1: Ratings of skills developed through CEL projects.

All students indicated some of the common challenges presented applied in their projects. The number and significance of these challenges varied from respondent to respondent. The impact of common challenges can be seen in Figure 2. One student also noted balancing academic work as a challenge, which may fall under time constraints.
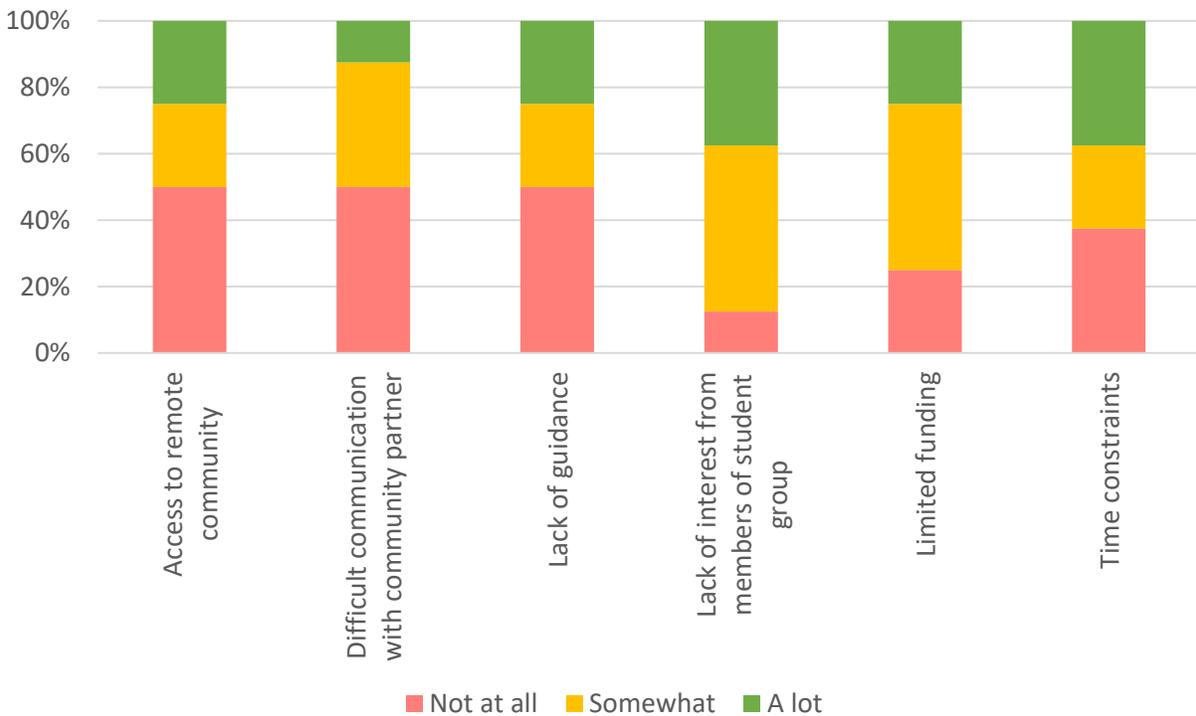

Figure 2: Selection of common challenges indicated by students

Helpful resources and supports students selected included the experience of past leaders (7), faculty (4), transition documents (4), Departmental staff (1) and Professional Development staff (1). Students noted a lack of resources/support for adapting to the pandemic (2), startup guidance (1), structure in how to mentor (1) and tools on how to engage the community (1). None of the students selected the CCEL as a resource they had used, showcasing a lack of knowledge of this resource in engineering co-curricular groups. This had been noted as well by the CCEL office, and engagement with CCEL may help to fill some of the resource gaps noted by students. Guiding students to support documents address areas of concern, some of which are provided by CCEL or other UBC entities, may be helpful.

Due to COVID-19 students indicated a lack of engagement among team members (4) and logistical difficulties making projects significantly more challenging or infeasible (5). However, one respondent noted that their group has become more independent in their abilities, relying less on others for space or for connections (as it was easier to find people online).

Of the 4 respondents not involved in CEL half of students were involved in discussing a CEL project that did not come to fruition. For those students a variety of barriers hindered engaged with CEL, most notably time constraints. For those students not having engaged in CEL, limited knowledge of community engagement strategies seemed to be a significant barrier. Many of these students were unsure which additional resources could be helpful in their work. Challenges due to COVID-19 was similar for these students who had not engaged in CEL as for those who had engaged in CEL.

Respondents indicated they are most interested in technical design projects (4), workshop delivery (4), mentorship (3) and event planning (1). Reasons for these selections included "practicing skills taught in school", helping improve the community, mentorship having a significant impact on them or others.

Given the small number of respondents, future work will seek to obtain a larger sample of students from the target student groups . With the initial understanding of the challenges faced by student groups, future iterations of this survey may seek to both collect data alongside providing students with resources and guidance on areas of concern that team members have noted. This may further incentivize survey participation by providing further guidance to students working on CEL as they complete the survey.

Conclusion

This study showcases a variety of ways that co-curricular engineering student groups engage with external community partners in Community Engaged Learning (CEL) projects. This engagement builds a variety of skills which align with the Engineers Canada Graduate Attributes. All students engaging in CEL noted some challenges impacting their work. Students also indicated their engagement with several resources, notably past leaders, faculty and transition documents. No students indicated engagement with the campus Centre for Community Engaged Learning (CCEL) showcasing an expected gap in knowledge amongst students. Students also indicated a lack of engagement and logistical hurdles as significant challenges present due to COVID-19. Despite these challenges, work is still continuing with many groups

and there is an opportunity to continue improving their CEL experiences through further engagement with the CCEL and strengthening of resources and guidance around community partner engagement and relationship building.

Acknowledgements

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Appendix A: Survey questions

Q1 What engineering student group(s) are you involved in? [select all that apply]

Q2 What is the first year you began your involvement in an engineering student group you selected above?

Q3 What is the last year you were involved an engineering student group you selected above?

Q4 What is your most recent role in your engineering student group(s)?

Q5 Have you been involved in projects or programs whereby your student group engages with the *community,* whether local or abroad?

----- Next survey page ---- shown if responding YES to Q5 ---- meaning the participant has been engaged in CEL ---- otherwise skip to Q16

Q6 What type(s) of activities were included as part of the community-engaged project(s) in your student group? [select all that apply]

☐   Event planning
☐   Mentorship
☐   Policy development
☐   Short-term volunteering (1 to 30 days)
☐   Long-term volunteering (1 year or longer)
☐   Technical design project
☐   Workshop delivery
☐   Other _____
☐   None

Q7 What role did you as an individual play in your student group's community-engaged project(s)? Examples may include workshop leader, classroom instructor, mentor, team manager, technical designer, etc.

Q8 What role did the community partner play in your student group's community-engaged project(s)? Examples may include educator on community experiences, bridge between student group and community members, providing space and/or time, etc.

Q9 To what extent have you gained the following skills or experiences as a result of the community-engaged project(s) in your student group? [select "not at all, "somewhat" or "a lot"]

- Design of solutions

- Application of engineering tools
- Effective teamwork
- Effective communication with a range of audiences
- Understanding of an engineer's role and responsibility in society
- Addressing community experiences through engineering activities
- Application of ethics, accountability and equity
- Incorporation of economics and project management

Q10 Please list any skills gained as a result of the community-engaged project(s) which were not listed above.

Q11 To what extent have you faced the following challenges or limitations in your community-engaged project(s) in your student group? [select "not at all, "somewhat" or "a lot"]

- Access to remote community
- Difficult communication with community partner
- Lack of guidance
- Lack of interest from members of the student group
- Limited funding
- Time constraints

Q12 Please list any challenges or limitations faced as a result of the community-engaged project(s) which were not listed above.

Q13 What support and resources did your student group utilize during the planning and execution of the community-engaged project(s)? [select all that apply]

☐   [University name redacted] Centre for Community-Engaged Learning
☐   [University name redacted] Departmental staff
☐   [University name redacted] Faculty (professor, instructor, etc.)
☐   [University name redacted] Professional Development office (under Faculty of Applied Science)
☐   Experience of previous project leaders in student group
☐   Transition documents by student group
☐   Other _____
☐   None

Q14 What did you find was lacking in the support and resources provided throughout the course of the community-engaged project(s)?

Q15 How has the COVID-19 pandemic affected your team's relationships with community partners and the subsequent community-engaged project(s)?

----- Next survey page ----- shown if responding NO to Q5 ---- meaning the participant has not been engaged in CEL ---- otherwise skip to Q22

Q16 Were you ever part of a discussion or involved in preliminary plans on a community-engaged project which did not come to fruition in your student group?

Q17 If yes to Q16, to what extent have the following challenges or limitations played a role in the community-engaged project's lack of execution? [select "not at all, "somewhat" or "a lot"]

- Access to remote community
- Difficult communication with community partner
- Lack of guidance
- Lack of interest from members of the student group
- Limited funding
- Time constraints

Q18 If yes to Q16, please list any challenges or limitations which played a role in the community-engaged project's lack of execution that were not listed above.

Q19 If no to Q16, what are the reasons your group chose to avoid engagement with the community through projects?

☐ Lack of alignment with student group's goals
☐ Lack of guidance
☐ Lack of interest from members of student group
☐ Limited funding
☐ Time constraints
☐ Other _____

Q20 What types of resources or support from UBC faculty and staff do you believe would make community-engaged projects more accessible to your student group?

Q21 How has the COVID-19 pandemic affected your team's willingness to engage with community partners on projects?

----- Next survey page ----- common for all respondents

Q22 What type of community-engaged project would you be most interested in pursuing?

☐ Event planning
☐ Mentorship
☐ Policy development
☐ Short-term volunteering (1 to 30 days)
☐ Long-term volunteering (1 year or longer)
☐ Technical design project
☐ Workshop delivery
☐ Other _____

Q23 Please explain your choice above of the type of community-engaged project you would be most interested in pursuing.