

SURREY ROBOTICS  
INNOVATION LAB

# CONNECT TO COMMUNITY GRANT FINAL REPORT

2019/2020

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# PROJECT REPORT

## OVERVIEW OF SRIL'S C2C PROJECT

Our vision for the Surrey Robotics Innovation Lab (SRIL) was to connect with the community and local organizations to deliver accessible STEM opportunities. Throughout the months of July and August, we hosted the Summer 2020 Workshop Series and engaged a diverse audience, ranging from aspiring elementary school students to university students. For a budding non-profit organization like ours, this was a dream come true. With additional funds available due to the transition to online programming, our team was also able to 3D print Personal Protective Equipment (PPE) for Fraser Heights Secondary School. All our work was made possible by the Connect to Community (C2C) Grant from the UBC Center for Community Engaged Learning, for which we are very happy to have received.

## SIGNIFICANT MILESTONES

This project was the first of its kind for many of our team members; it required us to apply ourselves in a multitude of areas. Due to the pandemic, the method by which we executed our project was significantly altered. Instead of hosting in-person VEX Robotics workshops, we hosted virtual workshops and invited industry professionals to share their experiences and knowledge. Unfortunately, this change resulted in not being able to fully meet one of our three learning objectives, which was to integrate knowledge to deliver and evaluate the different mentoring aspects of VEX Robotics with high school students. Although we developed our own workshop materials, we never had the chance to present them as originally planned. However, we are glad that our other two learning objectives were fully met and even exceeded some of our expectations.

### **Establishing Meaningful Partnerships with Organizations**

Our first milestone was successfully connecting with local organizations such as the [Surrey School District](#), [Simon Fraser University \(SFU\)](#), and the [UBC Centre for Community Engaged Learning \(CCEL\)](#) to promote our events and establish partnerships. These connections allowed us to gain valuable experience in communicating and collaborating with community partners in a professional and efficient manner to make a positive impact on the community.

## **Recruitment of New Members**

Our second milestone was the expansion of the SRIL team. By welcoming new team members, bringing them up to speed with our mission, and making sure they were all comfortable in their roles, we gained the skills necessary to coordinate a team of volunteers. With distinct roles, the team worked in together to reach a collective goal of delivering a nurturing robotics mentorship program. After these two months, we are all the more proficient in our marketing, communication, management, and technical skills. As future engineers and businesspeople, these skills will be invaluable to us in our work.

## **IMPACT OF GRANT FUNDS**

### **Summer Workshop Series**

To thank our workshop leaders for their help in making our event possible, gift cards were purchased for all three speakers and four panelists. By showing our gratitude, we established a positive relationship with our speakers, which will be essential for future events. Additionally, to encourage students to register for the workshops, we purchased gift cards that were used in a prize draw for individuals that signed up for all three events. This marketing tactic was successful in attracting at least 150 participants for each workshop, with a total of 520 participants across all three events. Grant funds contributed to our ability to make these online workshops completely free to attend for participants.

### **3D Printing PPE**

Since our workshops were adapted to an online format, we were able to avoid costs associated with an in-person event. These additional funds were used to purchase a 3D printer and rolls of filament for printing face shields and ear savers. The PPE was donated to one of our community partners—Fraser Heights Secondary School—to ensure that staff could continue to stay safe. Grant funds were critical to our ability to donate the PPE free of charge.

### **Website Development**

Due to COVID-19, much of our programming had to be transitioned online. As such, we decided to develop online learning modules, which were free to access by anyone. With the dedication of our Education and Curriculum team, seven

modules on VEX Robotics were successfully developed and published on the SRIL website. Grant funds contributed to our ability to allow continued free access to these online modules.

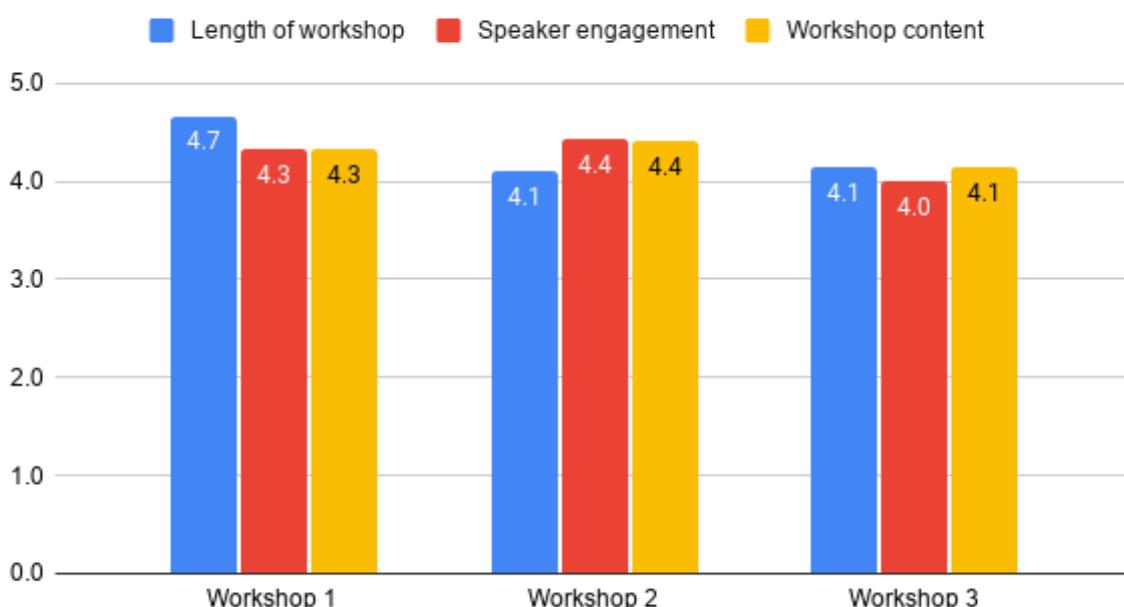
## PROJECT IMPACT AND ASSESSMENT

### Summer Workshop Series

Overall, the workshops received positive feedback and were attended mostly by high school students. Focusing on topics beyond the high school curriculum and providing a glimpse into the lives and work of industry professionals, these workshops were very helpful to these students, especially in a time where typical networking and informational events were cancelled due to the pandemic. Some students may have learned a new skill, others were inspired to pursue STEM, and some gained more insight on their post-secondary plans. Through this project, we were also able to establish a target audience for SRIL, and began using monthly newsletters to communicate updates and STEM opportunities.

In addition to analyzing workshop registrations, we created a feedback form to evaluate the success of our workshops. The results are shown below:

### Ratings (Out of 5) of Workshop Aspects



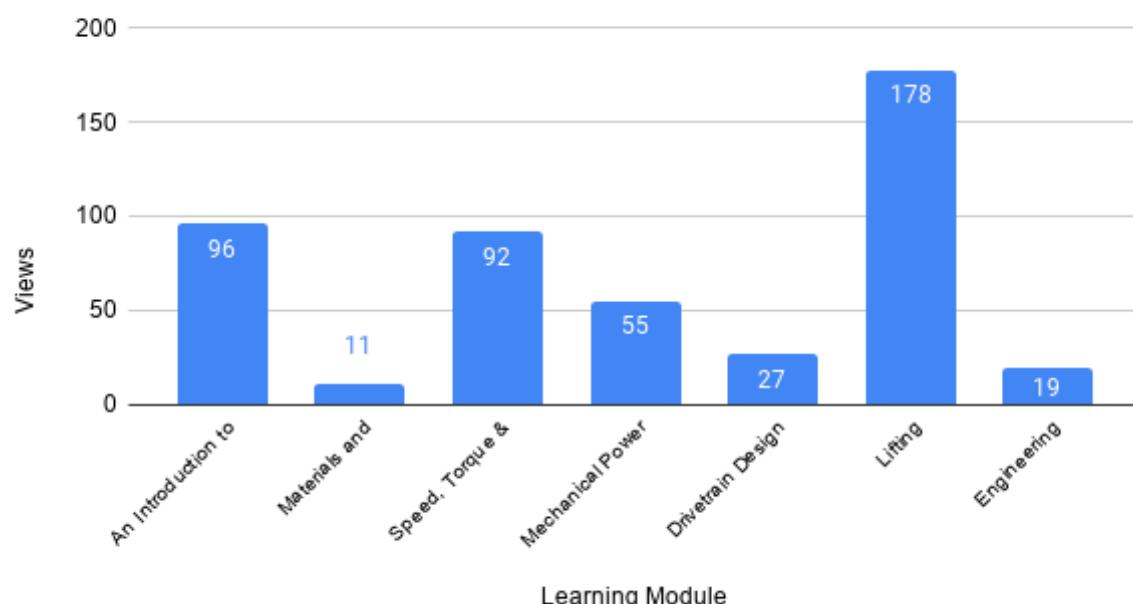
## 3D Printing PPE

The face shields and ear savers were positively received by the school administration, although their effectiveness was limited due to the decreased demand and increased supply of PPEs once the shortage issues during the first half of the year were resolved. This experience prompted us to reevaluate the necessity of 3D printing more equipment for schools in the future, and to look into alternative equipment that could be printed for other organizations.

## Website Development

To evaluate the impact of the online learning modules on VEX Robotics, we examined the website traffic on each module.

### Website Views on Learning Modules



## SUSTAINED IMPACT OF SRIL'S WORK

Through this experience, we developed our ability to communicate and work with other organizations in a virtual setting. These newly acquired skills were swiftly put to work in November of 2020, when we partnered with [UBC Geering Up](#) to run a Grade 9 Girls' robot coding workshop. As we head into our future projects, we will continue to welcome new team members to fill a wide range of positions so



that we can continue developing our website, educational programs, and community connections.

Overall, the C2C Grant has given SRIL the unique opportunity to connect with our community during these unprecedented times. We are delighted to have brought a workshop series featuring special speakers in a broad range of STEM topics to such a diverse audience at no cost to the participants. Our website's learning modules will also continue to serve as an important resource for many high school students looking to break into the world of VEX Robotics. The C2C Grant was pivotal for achieving SRIL's vision of connecting with the community and local organizations to deliver accessible STEM opportunities. With our first major projects under our belt, the funding has allowed SRIL to build a stable foundation and launched our organization into a position to explore new horizons. We are proud to have been a recipient of the UBC CCEL C2C Grant.

# EXPENSE REPORT

## Surrey Robotics Innovation Lab Connect to Community Expense Report

Expenditure Category	Total Expense
6 rolls of filament	\$ 190.65
2+5 rolls of filament	\$ 219.16
3 rolls of filament	\$ 76.99
Creality Ender3 3D printer	\$ 365.06
Website	\$ 51.00
Gift card for speaker 3	\$50
Gift cards for 4 panellists	\$80
Gift cards for prizes	\$170
<b>Project Cost</b>	<b>\$1,202.86</b>

# LEARNING SUMMARY

## REVIEWING OUR LEARNING OBJECTIVES

### **1) Capacity to integrate knowledge to deliver and evaluate the different mentoring aspects of VEX Robotics with high school students**

- *Online VEX Robotics Modules:* As part of our website, the curriculum developers of our team developed a VEX Robotics curriculum. The production of this curriculum involved gathering materials about math, physics, programming, and mechanism design from various educational and industry sources. Thus the curriculum enabled the team to build the skills required to prepare learning materials for students.
- *Summer Workshop Series:* This experience was complemented by the summer workshop series, during which our mentors had a chance to facilitate and answer questions from the participants about mechatronics, CAD and EDI. After the workshop series, we surveyed the participants on their thoughts about the content and delivery so that we can provide more engaging and enjoyable programs in the future. Overall, this project has trained us to integrate knowledge to deliver and evaluate the different mentoring aspects of VEX Robotics with high school students.

### **2) Ability to communicate and collaborate with community partners in a professional and efficient manner to make a positive impact on the community**

- *Finding and Coordinating Workshop Leaders:* Our workshop series demanded frequent updates with our partners. We ensured the workshop presenters were up to date with registration information and were prepared to integrate with our introductions and announcements to deliver their presentation as smoothly as possible. After each of the three workshops, we wrote thank-you cards to follow up with the presenters and demonstrate our appreciation for giving us their time.
- *Communicating with Teachers from Surrey School District:* Simultaneously, we communicated with our Surrey Schools representative to facilitate promotion throughout the local high school robotics community, and contacted other Surrey high schools to let them know about our workshops.
- The actions we took in communicating with our community partner and presenters have enabled us to grow our ability to communicate and collaborate with community partners in a professional and efficient manner to



make a positive impact on the community.

### **3) Capability to coordinate a team of volunteers filling distinct roles to work in tandem to reach a collective goal of delivering a nurturing robotics mentorship program**

- *SRIL Team Expansion and Organization:* Over the course of the project, we identified five distinct positions that our team members could fill. These were curriculum developer, innovation facilitator, marketing and outreach officer, hardware specialist, and software developer. We started as a very small team, but by the end of the project we had a total of 10 contributors, each filling their role of choice. Each team member had a de facto vice president from the admin team to report to and seek guidance from. For example, curriculum developers reported to Clement, the VP of programs and education. This system promoted an efficient yet tight-knit method of getting information across and helping each other.
- *SRIL Team Administration:* We held general meetings every week to update the team about the progress of the administrative tasks, including the contacting of presenters and communication with our community partner. The meeting planning site when2meet was used to decide on a time that everyone could accommodate. In addition to the general meetings, the admin team also met weekly to discuss topics related to logistics and administration. In summary, the C2C project has allowed us to expand our capability to coordinate a team of volunteers filling distinct roles to work in tandem to reach a collective goal of delivering a nurturing robotics mentorship program.

## **REFLECTING ON OUR LEARNING PROCESS**

### **Time Capsules**

To track our personal development, we decided to write time capsules; reflections or imaginary letters to our future selves. After each of our weekly online meetings, we allocated a section in the meeting notes to write a few sentences about what we did in the past week. As we look back at our time capsules, we are reminded of all the things we accomplished as a product of our learning.

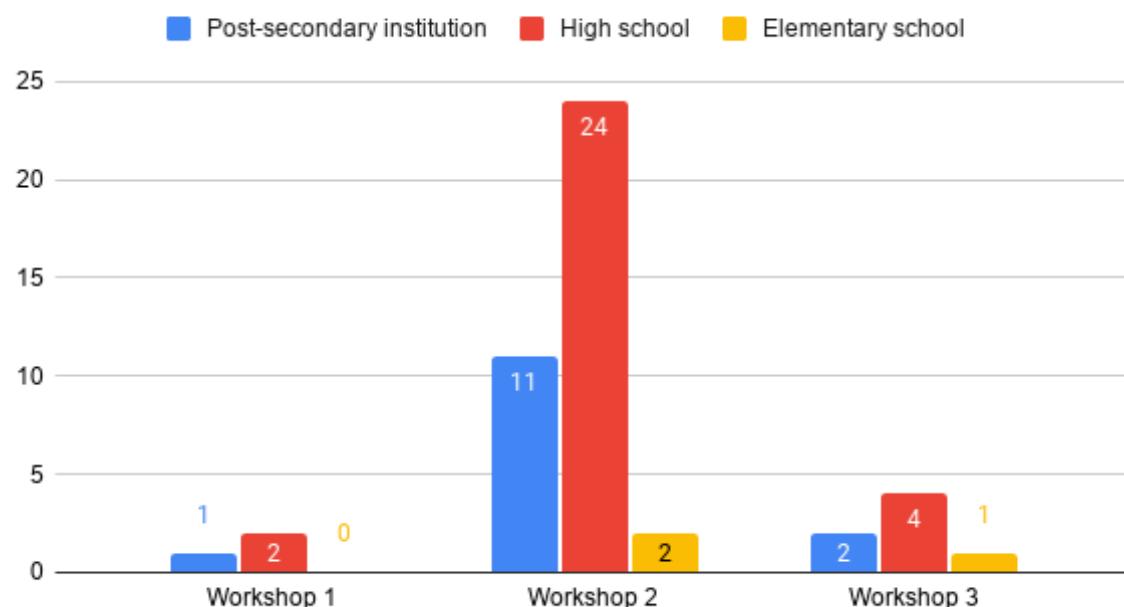
## VIEW TIME CAPSULES

### Event Feedback Forms

After each of the workshops that SRIL held during the Summer Workshop Series, we released a feedback form that allowed guests to provide suggestions and comments about the event. Analyzing the feedback from these forms allowed us to identify areas of improvement in team administration and event coordination:

- The Q&A session was very useful for the audience
- Zoom polls helped enhance the interactiveness of the workshop
- Details on the depth of the workshop content should be available
- An additional segment allowing for a hands-on activity could improve the length of the workshop and increase engagement
- The audience range was too wide to properly engage all students; the workshop content should be matched to the appropriate audience

### Education Level of Attendees



## VIEW WORKSHOP EVENT FEEDBACK

## KEY ACTORS IN OUR LEARNING JOURNEY

### **Admin Team (Sophie Lin, Clement Halim, Irene Zhang, Daniel Lui)**

Coordinated project logistics and administrative duties such as team management and communication with partners and sponsors.

### **Team Members (Navraj Sandhu, Ahasan Bhuiyan, Ramit Kataria, Dwayne Lemos, Kenny Niu, Shivam Kataria)**

Contributed to project goals, such as the robotics curriculum, website design, and workshop facilitation.

### **Workshop Leaders**

Contributed to the success of our workshop series, providing the team with important experience on how to run virtual events.

### **Workshop Participants**

Participated in our events and provided important feedback on both the event and how we could improve as a team.

### **Surrey School District Teachers**

Helped the team with promoting our workshops, providing the team with a important experience on how to communicate with community partners.

### **UBC CCEL Program Assistants (Michael, Wendy, Natsuki)**

Guided the SRIL team throughout the process of applying for the C2C Grant and approved budget changes.

## SIGNIFICANT CHALLENGES DURING THE PROJECT

Our vision was to give every high school student in Surrey an equal opportunity to partake in our STEM workshops. As a new organization, our main challenge with the Summer Workshop Series was garnering interest and spreading the word about our event.

We tackled this challenge by personally contacting secondary schools in the



Surrey School District, as well as promoting the event in university newsletters and clubs. Although we mostly received positive responses, we also encountered unresponsive contacts. However, with the help of some enthusiastic teachers, we were able to reach our target audience—high school students interested in STEM. With a total of 520 registrations—most of which were high school students who signed up for more than one workshop—our efforts paid off.

Our journey through these challenges showcased the importance of a coordinated team effort and a passion for making the SRIL vision a reality. With the entire team mobilized for the task of contacting secondary schools, we were able to 'cover more ground' and attract more participants. The visible results and success that followed the workshops served as a good motivator for the team and strengthened our dedication to SRIL.

Feedback from participants were largely positive, with many indicating an interest in future workshops or activities about STEM and robotics. We are delighted to have this news, and have already pursued collaborations with UBC Geering Up to deliver more robotics-oriented workshops for high school students. We look forward to expanding our reach and spreading the joy of robotics and STEM to a larger audience of budding scientists, engineers, and mathematicians in the future.

## **SRIL MOVING FORWARD**

As the President of SRIL, I will continue to lead the organization in this capacity and work towards the following goals.

### **Apply to the C2C Grant and Chapman & Innovation Grant**

The C2C Grant was a pivotal point for SRIL and made many of our projects possible through their funding. We will continue to apply to the C2C Grant for the 2021 program. Additionally, with previous experience in applying for grants, we will aim for the Chapman & Innovation Grant, which will provide us with the resources to expand our programming.

## **Website Development as a Portal to More Educational Resources**

This year has demonstrated the viability of an online educational format. As such, we plan to further develop our website with the help of our newly-hired Software Developer. We wish to transform the website into a 'portal' for educational resources, or a 'jump-off point' for students to further explore the world of VEX Robotics and STEM.

## **Registration as an Official Non-profit Organization**

To become eligible for a wider range of grants and funding, SRIL is looking into the process of registering as an official non-profit organization in BC. We will consult with community partners on this process.

## **TRANSFERABLE SKILLS DEVELOPED THROUGH THIS PROJECT**

- Community Engagement
  - Survey skills: getting feedback from participants and team to evaluate our workshops and continuously implement improvements
- Project Management
  - Team communication
  - Communication and coordination with speakers and panellists
  - Budgeting
  - Managing changing plans, such as making everything virtual in light of COVID-19
- 3D Printing
  - Printer assembly, troubleshooting, CAD, managing print settings
- Online Ordering
  - Evaluate similar products, and take into account shipping time, shipping fees, return policies, etc.
- Live Virtual Facilitation
  - Organize live workshop introductions, Zoom mechanics, speaker introductions, screenshots, Q&As, participants' questions, etc.

These skills will be extremely valuable regarding growing SRIL, future community projects, co-op applications, leadership in other extracurricular clubs, and my career as an engineer.

# PHOTO SUBMISSION



A screenshot of a Zoom video conference interface. The main area features a large, semi-transparent annotation overlay titled "WHAT IS A ROBOT?". The overlay includes a blue background with white text and several hand-drawn illustrations of robots. Labels include "can perform specific tasks", "reduces human effort", "helpful", "mech", "a machine", "fun", "take over world", "Wall-e", "Man-made", "Watson", "Computer", "Robot", and "Robot". Below the title, it says "DRAW/TYPE YOUR IDEAS ONTO THE SCREEN USING THE ANNOTATE FEATURE ON ZOOM!". To the right of the annotation, there is a 4x5 grid of participant video feeds. The participants are identified by their names: Mengen - Geerl... (highlighted in yellow), Sophie Lin - S..., Rima - Geerl..., Ahasan - SRIL L..., Bronwyn Arkest..., Kate, Sarah, Clissty Chow, Hadley, Sophie H., kaylee, Ameerit Sandhu, Dwayne L - SRIL..., Jade Aw-Yeong, Emma C, Pippi, Tessa Pretto, Navraj Sandhu -..., Luna Yin, Emily DuBois, Rebecca Fisher, Viduni (she/her), Maura Guidi, Ivy, Sophia, Sharvani and Ri..., Kathryn, and Bianca Choice. The video feed for Mengen - Geerl... is highlighted with a yellow border.



## PHOTO RELEASE FORMS FOLDER

# FINAL REPORT SURVEY

## 5. Final Report Survey

Please check areas of learning and engagement relevant to your project:

### Project Goals

- Operational efficiency
  - Expand capacity of community organization to serve community
  - Build skills of community members/community organization staff
  - Raise awareness of community organization activities
  - Understand feasibility of a project/idea
  - Analyze or revise a business process
  - Evaluate a program or project
  - Other: Please add additional goals:
- 

### Project Activities

- Building physical resources (e.g. construction project)
- Designing a physical resource (e.g. construction or product)
- Direct delivery of services to community members (e.g. front desk duties, program delivery, tutoring, mentoring)
- Conducting Research (literature review, developing research tools, collecting data)
- Analyzing data, policies or processes
- Creating communications materials (e.g. pamphlets, websites, fact sheets)
- Developing operational resources (e.g. process guides, manuals)
- Preparing recommendations or proposals
- Training community organization staff or volunteers
- Developing curricular resources (e.g. workshops, classes)
- Facilitating community dialogue or consultations
- Providing technical or clinical services to

the community organization or community members (e.g. IT support, dental clinic)

- Other: Please add additional activities (separated by commas):
- 

### Project Impact

- Improved/increased service to target community
  - More efficient use of community organization resources
  - Community organization better able to identify/understand community priorities, challenges, interests
  - Increased viability of community organization
  - Other: Please add additional impacts separated by commas:
- 

### Project Areas

- Aboriginal Engagement
- Advocacy - Civic Participation
- Arts - Heritage - Culture
- Business Development - Finance
- Community Development
- Education - Tutoring
- Engineering - Construction
- Food Systems
- Government - Policy
- Health - Human Services
- Inclusion - Diversity
- Languages - Literacy
- IT - Media - Communications
- Natural Resource Management
- Poverty and Housing
- Sport - Recreation
- Sustainability - Environment



**SURREY ROBOTICS  
INNOVATION LAB**

EMPOWERING YOUTH INNOVATORS  
THROUGH ROBOTICS