

2021 / 2022

Sheridan Research, Innovation and Entrepreneurship

Annual Highlights Report



Sheridan

Land Acknowledgement

We acknowledge the land for sustaining us and for providing us with the necessities of life. This territory is covered by the Dish with One Spoon treaty and the Two Row Wampum treaty which emphasize the importance of joint stewardship, peace and respectful relationships. As we reflect on land acknowledgements, let us remember that we are all stewards of the land and of each other.

Sheridan campuses reside on land which has been and still is the traditional territory of several Indigenous nations, including the Anishinaabe, the Haudenosaunee Confederacy, the Wendat, the Métis and the Mississaugas of the Credit First Nation. Since time immemorial, numerous Indigenous nations and Indigenous peoples have lived and passed through this territory.

Sheridan affirms it is our collective responsibility to honour the land, as we honour and respect those who have gone before us, those who are here and those who have yet to come. We are grateful for the opportunity to be learning, working and thriving on this land.

Research, Innovation and Entrepreneurship Excellence

At Sheridan, we spark and advance ideas to shape an ever-changing world through our research, innovation and entrepreneurship. We undertake and support work that matters to individuals, communities and industry with a collaborative and interdisciplinary approach.

In addition to the individual faculty, staff and students participating in research, Sheridan's renowned Research and Incubation Centres create economic and social impact across a wide spectrum including entrepreneurship, the screen industries, advanced manufacturing, mobile technologies, and supports for our aging population.

research.sheridancollege.ca.

A MESSAGE FROM LEADERSHIP



In this edition of our *Annual Report*, we celebrate the tremendous work of our students, faculty, staff and Centres. We couldn't be prouder of their achievements, which reflect the ingenuity, boldness and meaningful impact for which Sheridan is known. Research, innovation and entrepreneurship have continued to thrive at Sheridan in our transformed world, making economic, social and cultural contributions through collaboration and future-focused thinking.

Within these pages featuring some of our work in 2021/2022, you'll learn more about our researchers and innovators, the stories behind their work, and the impact they have made along with our external partners in the communities we serve. Among the highlights, you'll hear about Professor Nicole Johnson's passion to promote student wellness through research into trauma-informed practices; Professor Joaquin Moran's efforts to create a greener, more sustainable solution in nuclear power generation; and how the Screen Industries Research and Training Centre is strengthening an entire sector by being on the leading edge of virtual production techniques. These are mere glimpses into the research, innovation and entrepreneurship excellence at Sheridan that continues to find solutions to complex problems and drive positive and lasting change.

Congratulations to our community for their incredible accomplishments this year.

Carol Altilia,
Provost and Vice President, Academic

Andrea England,
Vice Provost, Research

FEATURE STORY

Shaping an ever-changing world

Research, innovation and entrepreneurship at Sheridan are united by a shared sense of purpose. This includes a passion for collaboration across disciplines and with community and industry partners, as well as a collective belief that we have the potential to influence the creation of a more sustainable world.

The drive to create positive change is based on different perspectives including Indigenous worldviews and can go by several names - just and sustainable development, social innovation, community well-being, or changemaking.

“All of our work in research and innovation is based for individual transformation and intentional impact,” says John Helliher, Sheridan’s Dean of Innovation.

The United Nations Sustainable Development Goals (SDGs) help measure the impact of changemaking efforts through their interlinked social, economic and environmental targets that seek to build a more sustainable and equitable future for all.

The SDGs are central, for example, to the mission of and delivery of programs and services by Sheridan’s EDGE Entrepreneurship Hub. EDGE has built a vibrant community centred around the

belief that entrepreneurship can make lasting and meaningful change in society. No matter what impact changemakers seek to achieve, EDGE’s team helps its clients to take their ventures from idea to execution and balance the triple bottom lines of people, planet and profit – a concept influenced by the SDGs’ multi-faceted approach to sustainable development.

EDGE has worked with ventures like **Brown Citizen Circle** that aims to elevate the voices of BIPOC (Black, Indigenous and People of Color) youth, and **BLK-Owned Hamilton**, that showcases and supports Black-owned business. Another venture, **HOPE Pet Foods**, is tackling the substantial environmental impact of traditional pet foods by offering an insect-based alternative.

EDGE understands that entrepreneurs can create social impact while creating value for customers and sustainable livelihoods for themselves and their teams. “Sustainability is at the core of what we do,” says EDGE’s director, Renee Devereaux. “Being a changemaker means working to create more sustainable livelihoods and communities. The SDGs help inform and connect the work EDGE founders do with efforts toward greater justice and equality around the world.”



Many research projects that reflect a commitment to sustainability and changemaking are also underway across Sheridan. In June 2021, the College was awarded a Natural Sciences and Engineering Research Council of Canada College and Community Social Innovation Fund grant to partner with the Region of Halton, Oakville Community Foundation and 14 other not-for-profit community organizations on “Community Ideas Factory: The Life Skills Project”.

Led by Dr. Sara Cumming, a professor in Sheridan’s Faculty of Humanities and Social Sciences, along with a research team comprised of colleagues from the Faculty of Applied Health and Community Studies, the Faculty of Animation, Arts & Design and the SPARK: The Sheridan Centre for Academic Excellence, this research responds to the need for effective life skills programming among marginalized and precariously housed individuals in Halton and beyond. This virtual program draws from the lived experience of participants to create a robust curriculum covering life skills like financial management, cooking and cleaning.

Ensuring all community members have the life skills necessary to flourish and live healthy lives is essential to long-term community and social sustainability.

“The aim of the Life Skills project is to increase the self-sufficiency of community members so that they can use their learnings to lead healthy, fulfilling lives, achieve economic and social mobility and give back to the next generation,” says Dr. Cumming.

A key aspect of both the Life Skills project and the work of EDGE is the transformative learning experience it provides for students involved. Sheridan is committed to expanding opportunities for students to engage in these types of activities both within our Centres and across all our Faculties.

Through research, innovation and entrepreneurship, students can put their discipline specific expertise to work and engage in interdisciplinary problem-based learning that develops their capacity to shape an ever-changing world.

HEALTHCARE INNOVATION BUILDS THE CLINIC OF THE FUTURE

Imagine a world where a health professional can instantly measure your key health metrics like blood pressure and heart rate and provide you with relevant medical advice from a clinic across town within minutes - all without leaving your house.

Enter the Clinic of the Future, an ongoing partnership between Sheridan's **Centre for Mobile Innovation (CMI)** and Kitchener-based Cloud DX, an award-winning virtual care solution provider. To tackle challenges in the delivery of patient care, the Clinic of the Future explores how wearable technology can work with computing platforms for the collection and analysis of easy-to-access health care data and insights for patients and clinicians.

CMI and Cloud DX have created a foundational software development kit that connects Cloud DX's proprietary VITALITI wearable health monitoring technology to patient monitoring tools used by health care providers.

"The purpose of the project has always been to create an accessible solution which can diagnose, treat and pre-empt health concerns," says Dr. Ed Sykes, Director of CMI. "Our work with Cloud DX has helped develop an innovative way to improve the clinician and patient experience, and ultimately impact health care delivery for the better."

CMI's research on the Clinic of the Future concentrates on augmenting the patient monitoring functionality offered by Cloud DX's VITALITI wearable device. The highly portable device, worn around the neck of a patient, takes measurements of important health indicators including blood pressure, heart rate and cardiac activity. The CMI research team consisted of students from the Honours Bachelor of Computer Science (Mobile Computing) program and professors from the Faculty of Applied Science and Technology. They built the backbone of the Clinic - the core software development kit which allows patient data gathered by the VITALITI device to be visualised, accessible and useable across mobile, web and augmented reality (AR) computing platforms.

The team developed several software solutions on iOS, Android and mixed reality platforms. iOS and Android mobile



apps are used by clinicians for bedside patient monitoring while the Microsoft HoloLens mixed reality platform is used to directly measure patient progress. A web app currently in development will be used by practitioners for remote health monitoring. These digital solutions translate the real-time data collected by the VITALITI device into dynamic images and graphs of patient data and trends.

With Cloud DX facing a lack of previous experience in AR applications, the company approached CMI for their expertise in mobile technology innovation. Initially funded by the Natural Sciences and Engineering Research Council of Canada, the next stage of the Clinic of the Future received support through an Ontario Centres of Innovation Voucher for Innovation and Productivity grant to help bring Cloud DX's AR platform (the basis of the Clinic of the Future) to life. The AR platform allows a clinician to use a mixed reality interface, wirelessly paired with multiple sources of information – including the VITALITI device, the electronic medical record, and the imaging database – to evaluate a patient more thoroughly and efficiently.

"Working with CMI has been essential in helping us push industry into the future, together. Improving healthcare is important to everyone - we all use it throughout our lives. Advancement in healthcare and medicine is possible through working with innovators like CMI, bringing our inventions to life and supporting our commercialization of new healthcare devices," says CloudDX Founder, CEO & President, Robert Kaul.

"There is even more potential we can unlock with the Clinic of the Future and further possibilities we can explore with the integration of wearable and digital technologies," says Dr. Sykes. "This is the future. This is the next generation of health care innovation."

ELEVATING ENTREPRENEURS AND CHANGEMAKERS

Since its launch in early 2018, Sheridan's **EDGE** has continued to build a vibrant community of changemakers who believe entrepreneurship can create lasting impact on our communities, society and environment. This is due in large part to valued partnerships and funding support from federal and provincial bodies.

In February 2019, the Federal Economic Development Agency for Southern Ontario (FedDev Ontario) announced a three-year funding partnership with EDGE, investing \$1.5 million to assist the Hub in delivering enhanced supports for entrepreneurs and changemakers as they advance the economic and social priorities of their communities. An additional \$1.5 million investment was provided by the Ontario Government.

These investments helped Sheridan create and implement entrepreneurial programming, develop workshops and events, support the hiring of staff members and mentors, and launch the EDGE space at Sheridan's Hazel McCallion Campus (HMC) in Mississauga. EDGE at HMC was designed as a regional hub for entrepreneurs to participate in EDGE programs, collaborate with other entrepreneurs, and work on their ventures in a co-working space. EDGE also focuses on creating connections between entrepreneurs and a wide range of innovation supports found at Sheridan, including access to student talent, faculty knowledge, and research expertise.

"We know there are lots of talented people on campus and in our local communities who have great ideas. FedDev Ontario's funding helped EDGE welcome that talent and learn how to best collaborate with the visionary founders we serve," says Renee Devereaux, EDGE's director.

Over the three-year period of FedDev and Ontario government funding, EDGE supported 270 startups, 12,000 participants, 59 partnerships and collaborations, created 750 employment opportunities, and helped participating ventures generate \$9.5 million in sales and investment. Social enterprise ventures like **Accelerate Her Future** and the **Afro-Caribbean Business Network** (ACBN) have received awards and gained national media exposure while sticking to their founding ethos of community impact.



As EDGE approaches its five-year anniversary, it continues to build a uniquely supportive community of changemakers who are actively addressing systemic barriers while fueling economic and social development through venture creation and growth. EDGE has unveiled new space at Sheridan's Davis Campus in Brampton and hopes to expand to Sheridan's Trafalgar Campus in Oakville in the future.

"We appreciate the support from our partners in the federal and provincial governments, as well as the private sector, for enabling EDGE to scale up its support to entrepreneurs who are building a more equitable and sustainable society in their own communities," says Devereaux. "EDGE has just scratched the surface of what's possible. With the help from these continuing partnerships, we will continue to elevate the brilliant entrepreneurs and changemakers in the Peel and Halton regions."

USING CHEMISTRY IN LIQUID-LIQUID EXTRACTION

Liquid-liquid extraction is an important process in the mining industry to remove metals from water, but it can have environmental impacts and be a costly process for a company. The metal recovery process can also impact efficiencies in production.

In 2017, Sheridan was awarded a Natural Sciences and Engineering Research Council of Canada Applied Research and Development grant in collaboration with Hatch Ltd., a global engineering company that provides services to a wide range of industries including mining, mineral processing and metals, to work on a solution to this challenge. The project was first led by Dr. Karina Lopez in the Faculty of Applied Science and Technology (FAST) before changing hands in 2020 to Anita Usas Neving, also a professor in FAST, in the School of Applied Chemical and Environmental Sciences.

The initial team of Lopez and students from the Mechanical Engineering program assessed the droplet size and method of separation after mixing to improve mixing performance and minimize separation time. More recently, Usas Neving and students from the Mechanical Engineering and Chemical Engineering programs (Catherine Giu, Kevin Theodore, Gurvinder Singh Sekhon, Charnele Andrews, Bryn Smith and Puneet Kaur Johal) added their chemistry expertise to the project by evaluating the amount of metal that was left in both the water and the organic matter after extraction.

A prototype pilot plant was built and demonstrated in the FAST engineering labs with support from the Sheridan **Centre for Advanced Manufacturing and Design Technologies (CAMDT)**. The prototype tested and evaluated different in-line mixers by mixing the water and organic solvent in the pipeline, pushing it through a settler and testing the recovery of the metals.

“Working with the Sheridan College FAST team



Pilot Scale Plant in Pipe Liquid Liquid Extraction Unit

provided Hatch with an opportunity to generate more insight into the development of liquid-liquid extraction technology. We would like to thank Professor Usas Neving and the entire Sheridan team involved in the project for their hard work and technical vision,” says Matthew Jones, Senior Process Engineer, Hatch Ltd.

“While we were making great progress in the project, it was also important to recognize the challenges because that’s part of undertaking research. Asking ‘will this work?’ ‘how do we tweak this?’ is about the learning and investigation that takes place during a research project,” says Usas Neving.

Equally important were the benefits that accrued for students by working on this large-scale project. “This was a great opportunity that allowed me to talk about my research role in my teaching and make it relevant for students,” says professor Usas Neving. “Work-integrated learning is invaluable for students as well; it gives them the opportunity to participate in research and include it on their résumé.”



Professor Anita Usas Neving

TACKLING COVID-19 ONLINE MISINFORMATION

A research collaboration between Sheridan professors, the private sector, not-for-profit organizations, and academic leaders in misinformation, has investigated creative ways to curb the spread of COVID-19-related misinformation online.

Dr. Nathaniel Barr and Dr. Michael McNamara from the Faculty of Humanities and Social Sciences, in collaboration with BEworks, MediaSmarts, Gordon Pennycook (University of Regina), David G. Rand (MIT), and Paul Seli (Duke University), designed, tested and disseminated evidence-based communication and education tools meant to change online behaviour and promote digital literacy.

At the height of the pandemic, online misinformation about COVID-19 was pervasive and contributed to a lack of compliance when it came to public health protocols. With the support of a Natural Sciences and Engineering Research Council (NSERC) of Canada Applied Research Rapid Response to COVID-19 grant, the research team came together in hopes of combining art and science to develop creative interventions aimed at tackling COVID-19 misinformation. The team began by looking at behavioural insights from scientific literature about why people think and act the way they do and then leveraged the creativity of Sheridan alumni from the Faculty of Animation, Arts & Design (Genevieve Ashley, Drew Shannon

and Erin McPhee) to visualize the findings. From there, the interventions were disseminated widely on social media, garnering over 1.3 million impressions on Twitter.

“We believe that these illustrations and interventions could be effective. A lot of misinformation seems to come in the form of visuals — things like pictures, memes and cartoons that are visually arresting and compelling. Part of the story for us is that the corrective mechanisms should at least be as compelling as what they are fighting,” says Dr. Barr.

The work from this unique project was based on creatively extending prior research that was published in the prestigious scientific journal, *Nature* by project partners Pennycook and Rand.

Dr. Barr and Dr. McNamara’s results have also contributed to a successful NSERC Promoscience grant to help continue their research on COVID-19 vaccine hesitancy.

*Credit: Excerpts taken from an edition of **Sheridan Take 5**.*

Sharing social media posts about COVID-19 can have severe consequences. Make sure what you share is true.



Sharing COVID-19 misinformation online can help the virus thrive. Make sure what you share is true.



LEVERAGING SIRT'S VIRTUAL PRODUCTION EXPERTISE



Sheridan's Screen Industries Research and Training (SIRT) Centre has collaborated with Toronto-based visual effects company Spin VFX to prototype new tools for use with virtual production. This partnership has enabled SIRT to be at the forefront of cutting-edge virtual production innovation supports used by the global film, television, and content industries.

Virtual production involves the use of real-time computer graphics to provide instant digital replacements for objects or characters during content production. One common virtual production technique is to use television screens and/or LED walls to display background images which are rendered in real-time from the perspective of a tracked camera. For example, an actor in front of a fake window on a film set could have a screen behind the window projecting a background. From the camera's perspective, it looks like another world is outside the fake window. The process makes it easy to add, move, or adjust screens – something that would be much more difficult to accurately measure or update in the rendering.

With the support of a Natural Sciences and Engineering Research Council of Canada Applied Research and Development grant, SIRT Research Lead Mike Darmitz,

along with co-investigator Mohammad Moussa and Sheridan co-op students from the Faculty of Applied Science and Technology (Hanan Fadel, Sina Lyon, Hailey Park, Adit Tandon and Vincent Zilbert), created a prototype that quickly and accurately measured and positioned multiple displays used for real-time graphic rendering in a multi-computer setup. The prototype provided several possible approaches to Spin VFX, including the development of new tools for use in their virtual production activities with clients.

"SIRT continues to strengthen the Canadian film and television industry by providing our industry partners with expertise and training in emerging technologies," says Darmitz. "With Spin VFX, we're able to share our student talent, impart our knowledge and leverage leading-edge tools like Unreal Engine and nDisplay to improve their client services in virtual production."

For more information about SIRT please visit www.sirtcentre.com.

LANDSCAPE FANTASIES

The vast terrain of the Canadian Arctic tundra. The majestic beauty of the Canadian Rockies. These descriptions invoke an array of reactions and emotions for Canadians – some heartwarmingly patriotic while others complicated and misrepresented.

With the support of a 2021 Scholarship, Research and Creative Activities (SRCA) Growth Grant, Professor Kathleen Hearn from Sheridan's Faculty of Animation, Arts & Design has delved into the mythology and meaning of Canadian landscape imagery. By using iconic and historic imagery of Canadian landscapes as a base, Hearn and students from the Honours Bachelor of Musical Theatre and Honours of Photography programs investigated, critiqued and played with cultured notions and representations of Canada. The responses and ideas from this work kick-started the development of large-scale diorama-style "fantasy landscape" photographs for future use in online and gallery exhibitions.

Since 2012, Professor Hearn has worked on visual art projects in Toronto, Senegal, Cuba, Argentina, Iceland, Paraguay and, most recently, the Canadian North, that explore the relationships and conflicts between landscape and portrait and the choreographed and natural. But over the last few years, she kept coming back to the notion of becoming more engaged in her own nation's landscape and what it means for Canadian identity.

"We have this idea that's been fed to us broadly of pristine lakes, landscapes and mountains. When we export what our nation is to other countries and people, these ideas are cultured into us, but for most of us that's not our immediate surroundings," says Hearn. "I became very interested in this kind of conflict between an imagined space and our real space – these complicated ideas that we have with nation. I wanted to deconstruct some of these ideas, these spaces that we have in our mind."

Professor Hearn worked closely with students from the project's concept to realization. The students honed many skills including sculpture and maquette building (a mock-up of a three-dimensional sculpture or architectural project) and were also involved in the critical discussion around the cultural production and impact of Canadian landscape.

"When you have a conversation about something that's abstract, there's something beautiful in that. There is influence of the maker's hand and imagination and then the interpretation of what's being said. We ended up with something that was completely different than what was initially intended, and I'm glad it turned out that way because of the collaborative work. It was lovely to see the growth in the students," adds Professor Hearn.

To view the project's images please visit www.kathleenhearn.com.



Credit: Kathleen Hearn, Professor of Video and Photography CCIT, a collaborative Honours B.A. Program between Sheridan College and the University of Toronto Mississauga.

THE POWER OF CREATIVE ARTS AND AGING

As learning and working remotely became the norm over the course of the COVID-19 pandemic, [Sheridan's Centre for Elder Research \(CER\)](#)'s activities in the creative arts proceeded remotely and showcased an important way for older Canadians to stay safely connected to one another.

Dr. Kate Dupuis, Schlegel Innovation Leader in Arts and Aging at CER and professor in the Faculty of Applied Health and Community Studies, witnessed the growing benefits of the arts for older adults as she transitioned her research activities to virtual delivery.

"The arts are very powerful but need to be accessible and meet the needs of individuals. Arts activities can be meaningful and purposeful for older adults, which benefits all domains of their well-being," says Dr. Dupuis. "It's not just about putting years to life but putting life to the years."

In its almost 20-year history, CER has been a leader in the

field through a collaborative, evidence-based approach to the health and well-being of Canada's growing older adult population. With the global shift to a virtual way of life, CER took an even more collaborative approach with their participants and community partners by providing new and innovative supports, like delivering creative arts activities remotely.

"We have to consider any new challenges and opportunities with a person-centric perspective," says Dr. Lia Tsotsos, CER's director. "Our research findings have shown benefits to overall well-being when introducing creative arts in the older adult community. By removing barriers to access and offering these meaningful activities in a more convenient manner, we can broaden our reach and continue to use these insights to help inform our work."

Virtual concerts

As an evaluative consultant to Concerts in Care Ontario, Dr. Dupuis worked with four senior access living centres across the province to provide her observations of reactions and interactions of older adults as they attended live concerts virtually from home or from their retirement and long-term care dwellings. Participants most enjoyed accessing this entertainment from the comfort of their homes and felt connected to the artists and one another even in a virtual modality.

Creativity and self-expression

Dr. Dupuis fostered a new collaboration for CER with the Alberta WP Puppet Theatre. She examined the benefits to participants' mental and social well-being of the WB Puppet Theatre's "VIEW from the Inside" virtual program, which invites participants to explore their creativity and self-expression through the creation of a self-portrait-based puppet.

Memory and creative expression

In collaboration with Baycrest Health Sciences and Professor Elaine Brodie in the Faculty of Animation, Arts & Design, Dr. Dupuis combined standardized memory training with a visual art-making experience. Dr. Dupuis and Brodie worked with participants to create a memory box that represented their learned skills and concepts related to memory formation.



Memory and creative self-expression project

CONNECTING FACULTY, STAFF AND STUDENTS TO TRAUMA-INFORMED EDUCATION

From her years of working in social services and teaching in Sheridan's Social Service Worker (SSW) program, Professor Nicole Johnson has become well-versed and passionate about the topic of trauma and adopting trauma-informed practices in classroom delivery. Once the pandemic hit, trauma quickly became a more relevant and timely topic of discussion.

"I definitely saw an increased impact on students' well-being, including feelings of isolation," says Professor Johnson. "Connecting with others is a critical factor for our well-being. Then add on the challenges of online learning. For many, the diverse impacts of trauma were around before the pandemic and became heightened during that time."

The Centre for Addiction and Mental Health defines trauma as the lasting emotional response that often results from living through a distressing event. Many students enter the post-secondary system with previous experiences of trauma such as bullying, violence in the home, racism, colonization, homophobia, classism, ableism and other forms of oppression. Some may also face trauma during college or university, which can impact their overall classroom learning experience. With the addition of a stressful global pandemic to the mix, Professor Johnson believed in the importance of having trauma-informed tools available not only to students, but faculty and staff as well.

Supported by a Scholarship, Research and Creative Activities (SRCA) Growth Grant, Johnson organized a research team that included co-investigator and Sheridan Student Affairs counselor Ida Gianvito – who has experience using a trauma-informed approach – and four students from the SSW program (Yumna Hussain, Tess Rahaman, Katie Sullivan and Chloe Shackelton).

Over the span of the project, the research team engaged participants across Sheridan in interviews and focus groups and held a Community of Practice Forum with a cross-section of community-based agencies, working from a trauma-informed practice lens. The project was further supported by a comprehensive literature review. Among their findings, the team found inconsistencies and ambiguities in the definition of trauma and a lack of connection between trauma-informed education and a systemic analysis that includes anti-racism, anti-oppression, equity, diversity and inclusion.

During her time as a student research assistant on the project, Yumna Hussain also recognized the relevancy of the topic. She adds: "Everyone has their own experiences, both within



Nicole Johnson, Yumna Hussain, Ida Gianvito, Chloe Shackelton, and Katie Sullivan. Missing in picture: Tess Rahaman.

their educational and personal experiences. When you bring everyone together, you're going to find out new ideas and new perspectives. There was always something we took away from the discussions to help inspire us and continue our passion for this work."

Based on their research findings, the group developed the "[Cultivating Trauma-Informed Spaces in Education Promising Practices Manual](#)". The manual includes information on trauma, pedagogical and practical strategies for incorporating trauma-informed practice in teaching and service delivery and recommendations for post-secondary education.

"Through the development of this manual and framework, we hope there can be an enhanced preventative and harm reducing response across post-secondary institutions. We hope to address some gaps and help people see the educator role beyond that of a teacher," says Johnson.

She notes that the success of the manual won't end with its use in teaching and student delivery. They hope to connect and collaborate with other departments at Sheridan and beyond, building and evolving the manual as new practices are formed.

"This project is about supporting proactive measures to promote students' resiliency, wellness and capacity to be effective learners, while reducing re-traumatization and vicarious trauma," says Johnson. "For trauma-informed education to be effective, we must play a role at all levels to support the collective care and well-being of our diverse communities and address the systemic causes of trauma inside and outside of the education system."

GLOBAL EDUCATION OPPORTUNITIES FROM HOME

International educational experiences are widely recognized as vital to student development. However, only one percent of students at Canadian colleges study abroad during their post-secondary programs, and historically underrepresented groups continue to face additional barriers to study abroad with limited access to international education. During the COVID-19 pandemic, most in-person study experiences abroad were halted, leading to the accelerated development of 'Internationalization at Home' methods, the most widely employed of which is Collaborative Online International Learning or COIL.

COIL courses virtually connect two or more classrooms, research teams and partners across the globe to collaborate on knowledge-making, problem-solving, and experience sharing. This method of learning was pioneered at the State University of New York (SUNY) at Albany as an opportunity to connect professors and students in different countries for collaborative projects.

Seeking to expand access and innovate opportunities for international education, Sheridan's Centre for Global Education and Internationalization (CGEI) worked with

Dr. Genevieve Amaral, the Associate Dean of the School of Humanities and Creativity in the Faculty of Humanities and Social Sciences (FHASS), to initiate the development, delivery and assessment of a COIL course at Sheridan. Funded by a grant from the Colleges and Institutes Canada (CICan) Outbound Student Mobility Program, Dr. Amaral developed and piloted a COIL course in FHASS while testing approaches that would better prepare students to transition to a future in-person study abroad experience.

"We always strive to create curriculum that is outward-looking and dedicated to advancing intercultural competence and understanding. COIL further opens the door to rich, direct international exchanges for Sheridan students, including those who would or could not have engaged in a traditional study abroad experience," says Dr. Amaral.



Dr. Genevieve Amaral



Dr. Amira El Masri

Proof of concept

Initially, COIL courses were offered by FHASS through their breadth courses, which are mandatory requirements for all students pursuing undergraduate degrees, and by Sheridan's Pilon School of Business in the Winter 2021 term. Establishing globalization opportunities like COIL within the degree breadth curriculum maximizes the availability of internationalization to a diverse spectrum of students. These early course offerings served as a proof of concept for COIL at Sheridan, allowing an opportunity to identify aspects of the program that worked well or needed to be adjusted based on program evaluation results.

Students were asked to evaluate COIL programs via surveys sent out both pre- and post-COIL course. Pre-course survey responses overwhelmingly emphasized the expectation of enhancing intercultural understanding and gaining a different perspective. While students confirmed these benefits post-COIL, survey respondents also remarked on the difficulty of collaborating across time zones and of establishing adequate communication.

FHASS professor Dr. Peter Galambos taught one of the first COIL courses offered at Sheridan in partnership with Tyumen University called Creative City & Culture. "Participating in a COIL course offered my students a unique and vital opportunity to expand their intellectual and creative horizons and establish new international connections," says Dr. Galambos. "By partnering with students abroad, COIL affords Sheridan students the chance to learn in a highly international and collaborative setting that deepens both their understanding of cross-cultural differences and their appreciation for what makes their own communities special."

The development of COIL curriculum represents a significant curricular innovation at Sheridan, bringing the potential to radically increase opportunities for international exchange and encounters for students and faculty. A COIL-based curriculum aims to expand opportunities for cross-cultural exchange while reducing barriers of participation and addressing issues of accessibility. The adoption of COIL also provided an opportunity for Sheridan to leverage its existing international partnerships while developing new opportunities with other institutional partners worldwide. Since its implementation

at Sheridan, 299 Sheridan students have participated in 10 COIL courses, learning and collaborating with 13 international partners in 10 different countries.

Next steps

CGEI and its Director, Dr. Amira El Masri, have worked with stakeholders across the institution to integrate international and intercultural education experiences into the curriculum and all aspects of Sheridan's campuses.

In addition to allowing for immediate implementation of COIL at Sheridan, CICan's funding has facilitated the creation of resources and support infrastructure to aid the expansion of further COIL offerings at the College. Sheridan will provide professional development opportunities for faculty to become 'COIL specialists' while providing access to global COIL knowledge sharing networks through SUNY.

The success of the initial COIL offerings provided the basis for CGEI to work with FHASS, PSB, the Faculty of Animation Arts & Design (FAAD) and the Faculty of Applied Science and Technology (FAST) to successfully apply for and receive an additional \$500,000 in federal funding under the Global Skills Opportunity program to continue to augment Sheridan's internationalization efforts under the umbrella of Sheridan's Reimagining Student Mobility project. This federal grant will allow Sheridan to expand its COIL course offerings into FAST and FAAD and introduce a range of online and in-person learning initiatives with educational partners worldwide while providing the means for more than 600 students to pursue international education opportunities over the next four years.

"COIL brings global perspectives to Sheridan's local context and provides the enrichment of internationalization to many students who otherwise wouldn't develop those cross-border connections," says Dr. El Masri.

POST-PANDEMIC IMPACTS AND RECOVERY IN SMALL BUSINESSES

Sheridan Pilon School of Business (PSB) professor Bamadev Paudel collaborated with PSB Associate Dean Karen Booth on timely research that examined the impacts of the COVID-19 pandemic on small business operations in Ontario. Supported by a Scholarship, Research and Creative Activities (SRCA) Growth Grant, Professor Paudel looked at the impacts to employment and innovation while identifying measures these businesses took to lessen the operational effects from the pandemic. The researchers surveyed business owners about how the pandemic impacted them and hosted in-depth interviews gauging their experiences.

“Small businesses are the backbone of the economy and it’s important to understand how they weathered such a major shock,” says Professor Paudel. “With small businesses employing 70% of the total Canadian labour force and creating 68% of net Canadian job growth, their economic and financial impact is a significant one.”

While national statistics showed that the employment effects of the pandemic were no worse in Ontario than in other Canadian provinces, Paudel’s research found that not all sectors were affected equally – with employment in the service industries sector (e.g. hospitality, personal care and entertainment) in Ontario declining 11% in the first half of 2020 compared to 5% in manufacturing sector. During one interview, for example, a service sector entrepreneur mentioned that they achieved cost savings by “automating just about everything.”

“Gathering these insights is important to provide a better understanding of how small businesses can address unexpected external shocks that may arise in the future,” says Paudel. “This research complements the existing pool of knowledge that explores the effects of COVID-19 on the business sector and overall Canadian economy.”



Professor Bamadev Paudel



Associate Dean Karen Booth

SUSTAINABLE SOLUTIONS FOR THE NUCLEAR INDUSTRY

As the world becomes increasingly dependent on the use of electricity to power our way of life, the importance of looking at more renewable and sustainable ways of keeping up with demand has also increased.

Dr. Joaquin Moran, professor in the Mechanical Engineering program in the Sheridan Faculty of Applied Science and Technology has collaborated on new research into clean energy with Stern Laboratories, a global engineering consultant for the nuclear industry. Professor Moran’s research focuses on using Computational Fluid Dynamics (CFD) - the use of computers for solution of 3D fluid-flow problems - and High-Performance Computing (HPC), which processes data and performs complex calculations at high speeds - to better understand the flow and heat transfer in a nuclear reactor.

The research was undertaken collaboratively with Dr. Farzin Abbasian, Specialty Engineering Manager at Stern Laboratories, acting as the Industry Principal Investigator for the project at Stern. Dr. Abbasian is also a part-time professor in FAST at Sheridan. The goal of the research is to develop safer and more energy-efficient reactors. This research was supported by FedDev Ontario through funding to the Southern Ontario Network for Advanced Manufacturing Innovation (SONAMI) facilitated through Sheridan’s Centre for Advanced Manufacturing and Design Technologies (CAMDT).

“The development of clean energy resources has become a priority in the power generation sector,” says Dr. Moran. “Research into wind, solar, nuclear and energy storage technologies and solutions is essential when thinking about sustaining our progress in electrification.”

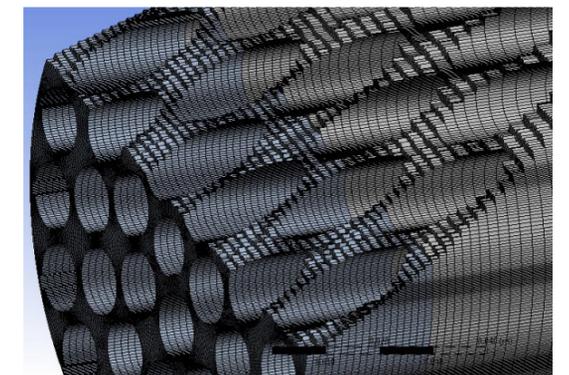
Initial simulations were done with a simplified geometry that was created through the engineering simulation computer software ANSYS. After fine-tuning the simulation, two turbulence models were explored (RSM and K-epsilon) to predict the temperature profile on the surface of the fuel tubes. After RSM proved

to better replicate experimental temperature measurements, a more detailed geometrical model was developed to perform a full-scale simulation with improved computational capabilities. These productivity improvement recommendations have since been provided to Stern Laboratories in the hopes of helping them better understand and measure heat dissipation.

Plans are also underway to incorporate research learnings from the project into the curriculum for the Bachelor of Mechanical Engineering program at Sheridan, where students currently use ANSYS to solve different engineering problems.



Fuel element used in CANDU nuclear reactors
(CNSC – Canadian Nuclear Safety Commission)



3D mesh used for the heat dissipation simulations
(courtesy of Stern Laboratories)

2021/22 Quick Facts

\$7,091,105

External Research Income

143

Number of externally-funded research projects supported by the Sheridan Research Office

127

Number of engagements with industry partners



62

Number of engagements with community and academic partners



Number of students hired to work on externally-funded research projects



Number of faculty and staff involved in research

2022 SRCA Growth Grants

The Scholarship, Research and Creative Activities (SRCA) Growth Grants program is intended to support a diverse range of activities at Sheridan by providing more opportunities for faculty members to pursue their scholarly, research and creative passions.

2022 Recipients:

“Stories of Home”

Diana Crina Catargiu (FHASS), Nataly Shaheen (FHASS), Suzanne Soares (FHSS), Sara Alexandre (FHASS), Claudia Daniela Cirip (FHASS)

“Contributing to a National Early Learning and Child Care System in Canada: An Environmental Scan of Early Childhood Policy and Programs”

Yalin Gorica (FAHCS), Yasaman Jalali-Kushki (FAHCS)

“The Canadian Literary Censorship Project”

Alexander Hollenberg (FHASS), Owen Percy (FHASS), Brandon McFarlane (FHASS)

“Seniors and Internet Health Activities. What Interventions Can Improve Internet Use in Managing Senior’s Health?” - SSHRC Explore Grant Recipient

John Laugesen (PSB), Lia Tsotsos (CER)

“Crocheted Connections: An Intergenerational Fibre Craft Project”

Karen Lints (LLS), Ferzana Chaze (FAHCS), Kate Dupuis (FAHCS)

“Storyfronts”

Elizabeth Littlejohn (FAAD)

“Machine Learning Strategies for Prediction of Vibrations in Energy Systems”

Joaquin Moran (FAST), Yasser Selima (FAST)

“Behavioural Special Education Identification and Family/School Engagement: Perceptions and Recommendations from a Community Research Team”

Lisa Phyllis (FAHCS)

“Innovative Program Evaluation Approaches: Creating a Digital Game-Based Tool to Evaluate Child and Youth Anti-Human Trafficking Programs”

Marlene Santin (FAHCS), Julie Dempsey (FAHCS), Andrew Hladkyj (FAAD)

“Enhancing the Motivation of ESL Learners in a Community College”

Alireza Sobhanmanesh (FHASS)

CELEBRATING STUDENT TALENT

Students play an important role in curricular and non-curricular scholarship, research and creative activities (SRCA) at Sheridan. As a way of recognizing and celebrating their commitment and excellence in this area, Sheridan launched the SRCA Student Awards in Spring 2021. These annual awards will recognize student involvement in a thesis, capstone or course-based research project, or as part of a funded or unfunded research project.

In the inaugural year for these awards, 24 nominations were received from a variety of Faculties, Research Centres and departments at Sheridan. These nominations celebrated the work of 47 students with 32 recipients receiving monetary awards and certificates of their achievement.

Excellence in curricular-embedded SRCA

Hamna Noor (Faculty of Animation, Arts & Design - FAAD)

"Flourish: Reducing Communication Issues in the South Asian Diaspora"

Abigail Grass (FAAD) Kaleigh Murphy (FAAD)

"Alice By Heart"

Innovation in research

Rhiannon Hoover (FAAD)

Alexandra Hutchison (FAAD)

Mikayla Kwan (FAAD)

James Petrasianas (FAAD)

"You've Got to be Carefully Taught: Decentering the Musical Theatre 'Canon'"

Heather Mazzonna (FAAD)

"Putting Food on the Table"

Student leadership in SRCA

Mireille Dube (FAHCS)

"The COVID-19 Pandemic Drift Towards Virtual Learning in the Post-Secondary Sector: The Effects on the In-Class Academic Barriers Experienced by Students with Autism Spectrum Disorder (ASD)"

Pushing interdisciplinary boundaries

Wilson Chan (FAAD)

Melodie Downey (Faculty of Applied Health and Community Studies - FAHCS)

Martin Gallagher (FAAD)

Elisar Haydar (Faculty of Humanities and Social Sciences - FHASS)

Robyn Miller (FHASS)

Daisy Sheps (FHASS)

Alexandra Siklos (FAAD)

"Remaking Critical Theory"

Mohammad Faizal Eidoo (FHASS)

Jacquelyn Ferguson (FHASS)

Sunha Whang (FAAD)

"Mobilizing Social Innovation to Train the Next Generation of Theatre Entrepreneurs"

Creative activities

Rupinder Kaur (FAHCS)

Corrin Marier (FAHCS)

Carter McCormack (FAHCS)

Leila Takei (FAHCS)

Julia Thompson (FAHCS)

Gillian Towell (FAHCS)

"Wellerness Activities"

Ameicka Arboine (FAHCS)

Sania Aslam (FAHCS)

Amirah Audoo (FAHCS)

Aliza Khan (FAHCS)

Kiranjeet Saraon (FAHCS)

"Creative Venture Challenge"

Team collaboration in SRCA

Garrett Hoffland (Faculty of Applied Science and Technology - FAST)

Nathan Lapp (FAST)

"Dynamic Digital Humans"

Thank You!

We would like to thank the funding agencies, organizations and donors whose vital financial support has helped us build and shape a culture of innovation across Sheridan. We would also like to extend our gratitude to the many businesses and community organizations who provided matching funding and in-kind support for collaborative research initiatives.

Biosteel Canada

Canada Foundation for Innovation

Canadian Institutes of Health Research

Centre for Aging & Brain Health Innovation

City of Toronto

Colleges and Institutes Canada

E-Campus Ontario

FedDev Ontario

Future Skills Centre

Ministry of Colleges and Universities

Mitacs

Ministry of Labour, Training and Skills Development

National Research Council of Canada

Natural Sciences and Engineering Research Council of Canada

Ontario Centre of Innovation

Public Health Agency of Canada

RBC Foundation

Schlegel Villages

Social Sciences and Humanities Research Council of Canada

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