2019-2020

ANNUAL RESEARCH REPORT

DAWSON COLLEGE RESEARCH OFFICE

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MESSAGE FROM THE DEAN OF ACADEMIC DEVELOPMENT (OAD)

Reflecting on the 2019-2020 academic year, we never would have imagined the changes that the Dawson Community and the entire world would face. Despite the challenges of the COVID-19 pandemic, Dawson Faculty, research assistants and student interns alike continued to collaborate and conduct research.

We welcomed several exciting new initiatives and projects from a wide range of fields, including math, ecophysiology and artificial intelligence, and we said farewell to two of our Research Office colleagues, Uzma Jamil and Daniel Tesolin, as they embarked on new research endeavours.

The annual research report is usually comprised of all the research activities that members of our Dawson community conduct throughout the year. As we transitioned from in person activities to a virtual environment halfway through the winter semester, our annual Celebrate Research event and the call to the community for research news unfortunately had to be cancelled. Therefore, this year we present to you an abridged report highlighting our **award winning Dawson Faculty researchers**.

In the next few pages, we invite you to be inspired by the innovative grant funded research projects, which have brought in more than $480K this year alone, and to appreciate the many funding opportunities available to current and future Dawson researchers.

Thank you to our research community for your continued dedication and contributions to the Dawson community and the world.

Catherine LeBel
Dean of Academic Development

RESEARCH HIGHLIGHTS

718 K

There were 18 grant-funded projects under way in 2019-2020. The total research funds awarded this year was approximately $598K adding to a total of $718K grant funds available to our active research grant holders in 2019-2020.

18

18 principal investigators and one student intern were awarded funding from public and private research granting agencies. While five projects were completed over the course of the year, having reached the end of their grant cycles, another five projects secured new funding.

3 AI

A new category was added to the list of research disciplines managed by the Research Office in 2019-2020. Two Dawson researchers and their partners at Concordia and McGill University were awarded a combined total of $422 795 for three different Artificial Intelligence projects.

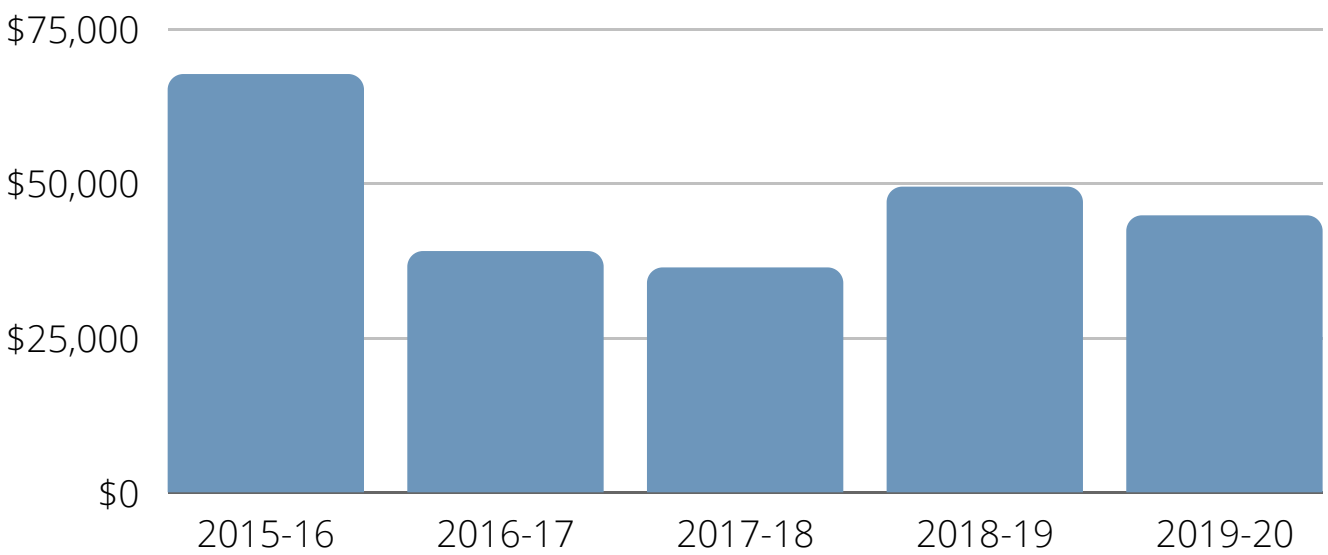
RESEARCH SUPPORT FUND

Dawson College acknowledges support from the Tri-Council Research Support Fund (RSF).

The Research Support Fund assists Canadian postsecondary institutions with the expenses associated with managing the research funded by the three federal research granting agencies. The Government of Canada allocates a portion of research grants from federal agencies received by researchers to their home institutions each year.

RSF grant funds are used to offset salaries for the Research Office staff and professional development activities in research administration. These staff play a central role in identifying and advertising funding opportunities, ensuring grant applications are complete and admissible, tracking institutional and REB (Research Ethics Board) approval, ensuring compliant post-award administration, and internal benchmarking and report writing.

In 2019-20, Dawson College was awarded a grant of $44,714 from the Research Support Fund, all of which was used towards management and administration costs. The full public disclosure of funds statement for this year and previous years is available on the Dawson Research website.



GRANT FUNDED RESEARCH ACTIVITIES

Artificial Intelligence

CATHERINE FICHTEN

Title: How smartphone virtual assistants and applications powered by artificial intelligence can help promote the academic success of post-secondary students with disabilities

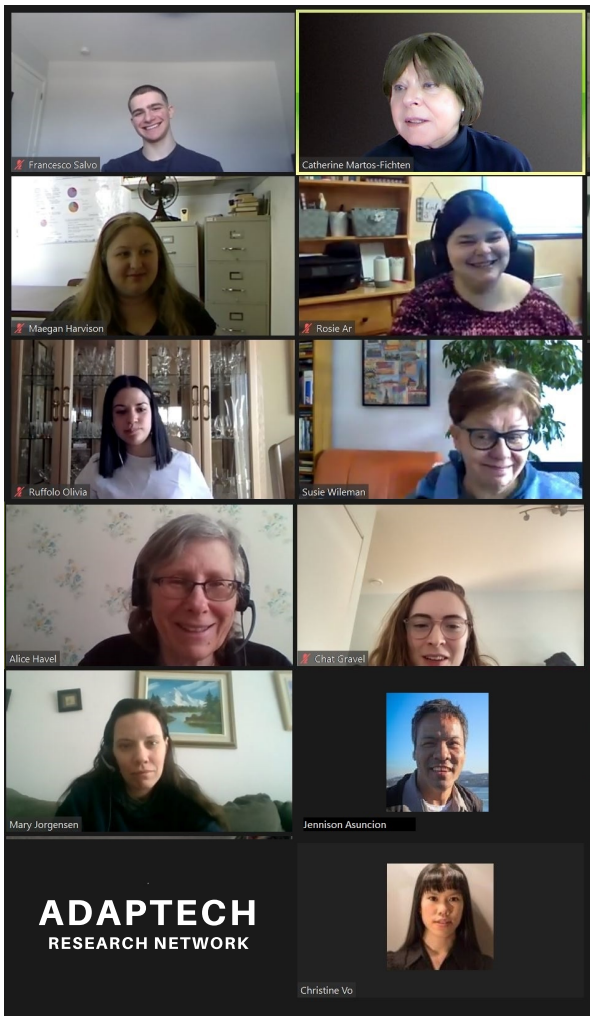
Award: Pôle montréalais d'enseignement supérieur en intelligence artificielle (PIA) $100,000

Describe your research in five words or less.
Siri, Google Assistant, and Alexa are not yet ready for college.

What are you investigating?
How smartphones could assist students with and without disabilities

What is the most common misconception about your research?
That I do all the work by myself.

What do you plan on investigating next?
How AI based smartphone apps can be used by students with attention deficit hyperactivity disorder (ADHD).



GRANT FUNDED RESEARCH ACTIVITIES

English

STEWART COOKE

Title: A scholarly edition of the letters of Charles Burney, volume 4 (1802-1807)

Award: Insight Development - Social Sciences and Humanities Research Council

Describe your research in five words or less.
Definitive Edition of Burney's Letters.

What is the goal of your research?
To make an annotated series of all of Burney's letters available to literary and music historians as well as interested general readers.

What is the most common misconception about your research?
That it is less difficult than literary criticism.

What do you plan on investigating next?
Italian wines, region by region.

Publications
Editor. The Letters of Charles Burney. Vol. 4. Oxford: Oxford UP, forthcoming.

GRANT FUNDED RESEARCH ACTIVITIES

Special Areas of Study

MICHELLE SMITH

Title: A First Peoples storytelling exchange: intersecting college and community circles

Award: College and Community Social Innovation Fund: Partnership Development

Describe your research in five words or less.
Indigenous students transforming post-secondary education!

What is the goal of your research?
The FPPSE ultimately aims to improve post-secondary education to make it more accessible, welcoming and relevant for First Nations, Inuit and Métis students. The project also honours and celebrates Indigenous knowledge and approaches to teaching and learning such as intergenerational and land based pedagogies.

What is the most common misconception about your research?
I have not encountered any misconceptions, but there have been lots of visits to the project site and requests for presentations from our team. We're really proud of what we were able to create together, and in such a community based collaborative way: 100+ stories, dozens of films and videos and a dynamic network of students and scholars.

What do you plan on investigating next?
I am investigating community-based and self-determined Indigenous models of post-secondary education. While things are changing for the better in higher education, the ways colleges and universities generally function don't really align with Indigenous values. How can young First Nations, Inuit and Métis achieve their educational goals while practicing their own culture and identity/staying true to who they are? Many FPPSE storytellers shared that they don't want to and shouldn't have to choose between "western" education and their own culture and identity. Indigenous peoples are creating their own sovereign models to support young people in developing skills to navigate both worlds.

GRANT FUNDED RESEARCH ACTIVITIES

History

STACEY ZEMBRZYCKI + NANCY REBELO

Title: Survivors on the Main: Witnessing the Holocaust, Remaking Home in Montreal

Award: Partnership Engage Grants (SSHRC)

Describe your research in five words.
Holocaust survivors' postwar memories of Montreal

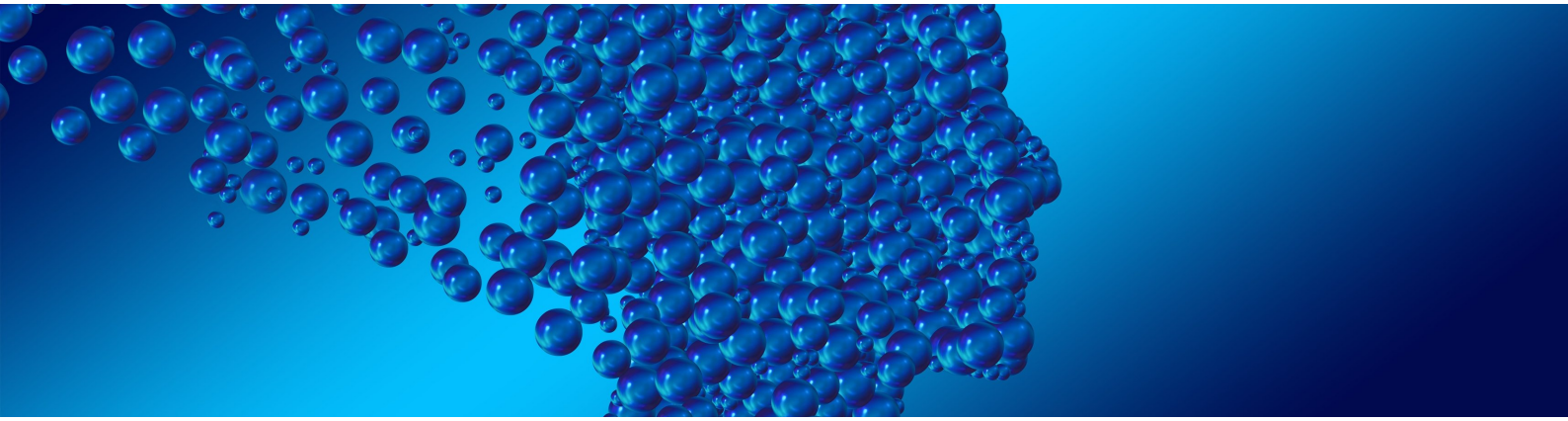
What is the goal of your research?
The historical audio/virtual tour enables listeners to walk in the footsteps of six child survivors who came to Montreal, Quebec, through the War Orphans Project in 1948 to rebuild their lives in the city's Mile End and Plateau neighbourhoods. It is their voices that guide listeners through the experience of starting anew.

What is the most common misconception about your research?
The most common misconception is that this work has been done, that survivors' stories have been told. While this is true for understanding their experiences during the Holocaust, few have ever been asked to speak to their experiences beyond the war years. Our shift to the postwar period is crucial particularly as we debate how to teach about Canadian values, multiculturalism, immigration, and human rights.

What do you plan on investigating next?
We both remain committed to understanding and making that history accessible to a variety of publics through a range of stories. Nancy is interested in walking tours and telling the stories of those immigrants who were central to Montreal's postwar garment trade. Stacey is hoping to work with residents of the city's CHSLDs to understand their life stories, and their pandemic experiences, while also building relationships between elders and Dawson College social science students.

GRANT FUNDED RESEARCH ACTIVITIES

Psychology



CATHERINE FICHTEN

Title: Centre d'études sur l'apprentissage et la performance (CEAP)

Area of Research: Education, Knowledge and Skills

Award: Dégagement d'enseignement pour la recherche au collégial lié au programme Regroupements stratégiques - FRQSC

Describe your research in five words or less.
What extensions could help students?

What are you investigating?
What browser extensions could help students with and without disabilities and the use of Chrome, Firefox and Edge browser extensions.

What is the most common misconception about your research?
That all browser extension are safe to use and that I do all the work by myself.

What do you plan on investigating next?
Which browser extensions are especially useful for students with disabilities.

GRANT FUNDED RESEARCH ACTIVITIES

Biology

TONIA DE BELLIS

Title: Tracking changes in soil microbial communities in response to an invasive pine in treeless alpine ecosystems

Area of Research: Ecology and ecophysiology

Award: Programme de recherche pour les chercheurs et les chercheuses de collège - FRQNT

Describe your research in five words or less.
Understanding processes influencing microbial diversity.

What is the goal of your research?
The main goal of my present FRQNT funded project is to examine changes in microbial communities in response to the invasion of a Canadian native tree species (lodgepole pine), in a treeless alpine ecosystem in Argentina.

What is the most common misconception about your research?
That microbes are bad and that fungi are gross. Microbes are essential for the proper functioning of all ecosystems! They are involved in nutrient cycling and most plants on the planet rely on mutualistic fungi to obtain nutrients from the soil. Most life on the planet directedly or indirectly relies on the work of microbes to stay alive!

What do you plan on investigating next?
One of the leading threats to biodiversity worldwide is urbanization and the expansions of cities. Montreal, in particular, is known as one of the most rapidly expanding cities in industrialised countries. The goal of my next proposed study is to look at the effects of urbanization on the community composition of insects and soil dwelling fungi along an urban gradient.

GRANT FUNDED RESEARCH ACTIVITIES

Medical Technologies

VANESSA GANGAI + ALISON GELINAS

Title: Student Retention Through Fall Prevention

Area of Research: Retention initiatives and information sharing

Award: Dialogue McGill Retention

Describe your research in five words:
Healthcare - Exposure - Quebec Regions - English

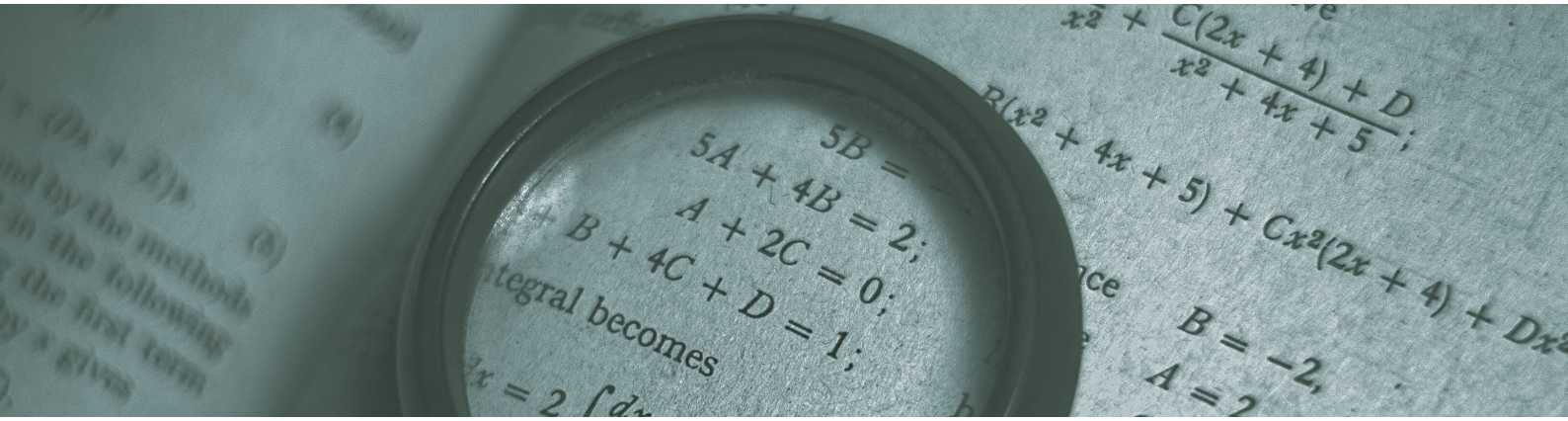
What is the goal of your research?
The goal of our project was to increase access to English language healthcare services in the regions of Quebec.

What is the most common misconception about your research?
The most common misconception regarding our project is that it is no harder to access English language healthcare services in the regions of Quebec as compared to Montreal.

What do you plan on investigating next?
We have been fortunate to have been given additional funding from Dialogue McGill for 2021-2023. Therefore, we will continue to expose students from the Eastern townships to healthcare programs in Montreal with the goal of having them return to serve their communities. Concurrently, we hope to sensitize English speaking students in the professional healthcare programs in Montreal to the need for their services and extensive opportunities that await them in the beautiful regions of Quebec.

GRANT FUNDED RESEARCH ACTIVITIES

Mathematics



RICHARD FOURNIER

Title: Quelques problèmes d'analyse complexe
Award: Programme de recherche pour les chercheurs de collège - FRQNT

Title: Centre de recherches mathematiques (CRM)
Award: Programme de recherche pour les chercheurs de collège lié au programme Regroupements stratégiques - FRQNT

Area of Research: Mathematical analysis

Describe your research in five words or less.
Mathematics - Analysis - Function - Theory - Approximations

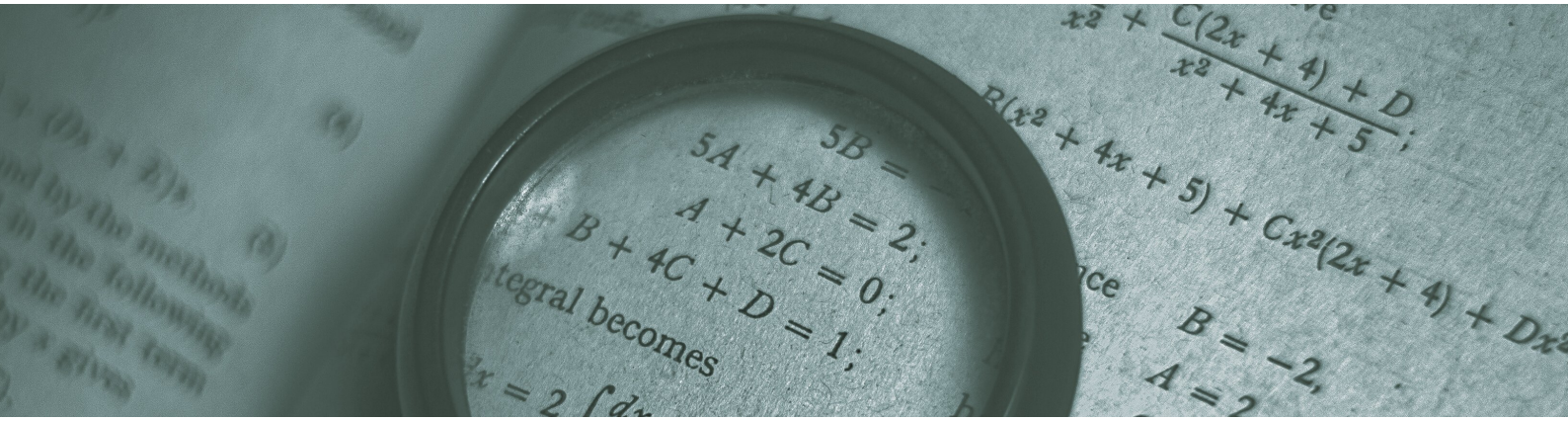
What is the goal of your research?
The goal of my research is to prove new relevant results in the field of Complex Analysis. i.e. results about conformal maps, polynomials and various types of analytic functions.

What is the most common misconception about your research?
Most people don't understand the difference between an accountant and a mathematician.

What do you plan on investigating next?
For 2021-2022, I have papers in progress concerning general Complex Analysis (the Rogosinski Problem for polynomials of fixed degrees), Real Analysis (L'Hôpital's rule) and historical matters (review of a paper by Brickman and Ruscheweyh).

GRANT FUNDED RESEARCH ACTIVITIES

Mathematics



MATHILDE HITIER
(CO-PRIMARY INVESTIGATOR)

Title: Créer des liens entre mathématiques et physique : Développement d'un cours intégrant calcul différentiel et mécanique et étude de son impact sur la compréhension de la notion de dérivée. (Co-primary investigator)

Award: Programme d'aide à la recherche sur l'enseignement et l'apprentissage

Describe your research in five words or less.
Velocity is a derivative.

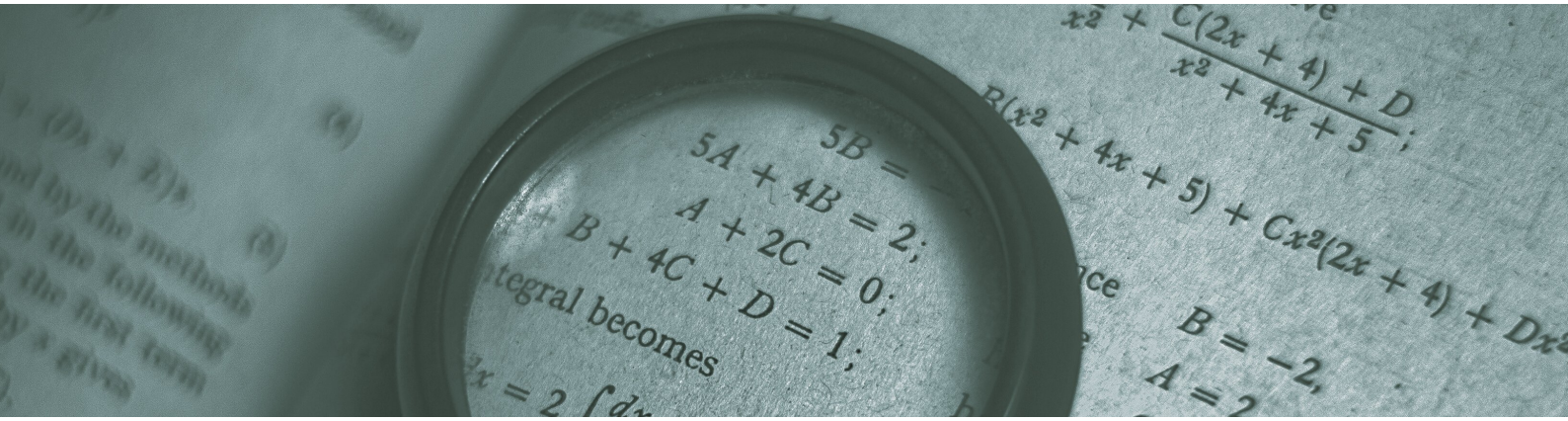
What are you investigating?
Our research focuses on the pairing of calculus and mechanics in the science program. We would like to study the influence of the pairing on students' understanding of derivative, a calculus notion which measures rates of change like velocity or acceleration. We are also working on improving the pairing by reinforcing and making more explicit the links between the two courses.

What is the most common misconception about your research?
One can think that if students are able to do something in mathematics, they would naturally be able to apply it in physics or any other domain. Or reciprocally, if they know what velocity is, they understand the rate of changes and derivatives. In short, that students are naturally able to "transfer" knowledge or skills from one domain or topic to the other.

What do you plan on investigating next?
I am passionate about making calculus more meaningful (and why not more useful) to students. So I will definitely continue researching in that direction, either by working on other notions at the intersection between calculus and physics, or turning to disciplines other than physics, which also use mathematical tools.

GRANT FUNDED RESEARCH ACTIVITIES

Mathematics



ANDREAA STANCIU-PANAIT
(CO-PRIMARY INVESTIGATOR)

Title: Créer des liens entre mathématiques et physique : Développement d'un cours intégrant calcul différentiel et mécanique et étude de son impact sur la compréhension de la notion de dérivée.

Award: Programme d'aide à la recherche sur l'enseignement et l'apprentissage

Describe your research in five words or less.
Connections between Calculus and Mechanics.

What is the goal of your research?
The purpose of the project is to create a paired course between Calculus and Mechanics and to study if the students will understand better the derivative after following such a course.

What is the most common misconception about your research?
The biggest misconception is that the project will bring overload to the courses but in fact it is the opposite. It helps create links and gives many possibilities to explain better a number of concepts.

What do you plan on investigating next?
An important goal for me is to make the resources created during this project available to the CEGEP network so that the paired course, Calculus-Mechanics, could be followed in other institutions.

GRANT FUNDED RESEARCH ACTIVITIES

Pedagogical Research

ELIZABETH CHARLES
CHRIS WHITTAKER + YANN BROUILLETTE

Title: Gestion et régulation du flux d'information en apprentissage actif
Area of Research: Active Learning

Award: Programme d'aide à la recherche sur l'enseignement et l'apprentissage

Describe your research in five words or less.
Feedback in Active Learning

What is the goal of your research?
To examine the characteristics of teaching practices associated with active learning – i.e., student-centered vs. teacher-centered; to examine the role of teacher and peer feedback in active learning instruction; to conduct a design-base research (DBR) focused on peer feedback and explore the impact of this design (specifically, "error-detection" and peer feedback) on students' learning.

What is the most common misconception about your research?
There are two main misconceptions: (1) giving "effective" feedback is "not" an automatic process – in fact, students need both guidance and practice to engage in the process (i.e., peer feedback); (2) assuming that students will benefit from the feedback received – feedback received is only valuable when it is explicitly used to make improvement(s).

What do you plan on investigating next?
Our research team will be investigating the use of Inquiry-Based Labs in the Science Program across colleges (English & French) and the three key disciplines (Biology, Chemistry and Physics). And, examining the impact of scaffolds to leverage the affordances of the inquiry approach to support and increase the learning of scientific thinking – i.e., critical thinking, scientific reasoning, etc.

GRANT FUNDED RESEARCH ACTIVITIES

More Award Winning Researchers

ANNA-LIISA AUNIO

Title: Transformations social innovation hub in food justice and sustainability
Area: Sociology
Award: NSERC - College and Community Innovation Program

BENJAMIN SEAMONE

Title: Nouvelles directions dans le modèle «policiers-voleur» de fouilles des graphes
Area: Mathematics
Award: FRQNT - Programme de recherche pour les chercheurs de collège

ELIZABETH KIRKLAND

Title: Modernité et savoir à Montréal, 1815 - 1985
Area: History
Award: FRQNT - Soutien au recherche en équipe

KENGATHARAM THIRULOGASANTHAR

Title: Coherent states, frames, wavelets and orthogonal polynomials on quaternion Hilbert spaces
Area: Mathematics
Award: FRQNT - Programme de recherche pour les chercheursde collège

JOEL TRUDEAU

Title: Artificial Intelligence Competency Frameworks: A success pipeline from College to University and beyond
Area: Artificial Intelligence
Award: Pôle montréalais d'enseignement supérieur en intelligence artificielle (PIA)

Title: Intégrer des environnements d'apprentissage intelligents pour soutenir la prochaine génération
Area: Artificial Intelligence
Award: MEI - NovaScience volet 2

Student Research

MIRIAM LOULOU

Title: How do drug related cues influence brain responses to an amphetamine challenge: a functional magnetic resonance imaging study
Area: Neuroscience
Agency: FRQNT - Programme de Bourses pour stages d'été au collégial 2019-2020

GRANT FUNDED RESEARCH ACTIVITIES

Publications

Adams, R., Jackson, P.A., Lenton, K., Dugdale, M., **Whittaker, C.**, Lasry, N., **Charles, E.S.** (2019). Error detection tasks and peer feedback for engaging physics students. Fifteenth Conference on Education and Training in Optics and Photonics: ETOP 2019.

Charles, E., Slotta, J., Cassidy, R., Dugdale, M., Zhang, C., & Lenton, K. (2019). How Teachers Implement Active Learning: Typologies of Orchestrational Flow. In Lund, K., Niccolai, G. P., Lavoué, E., Hmelo-Silver, C., Gweon, G., & Baker, M. (Eds.), A Wide Lens: Combining Embodied, Enactive, Extended, and Embedded Learning in Collaborative Settings, 13th International Conference on Computer Supported Collaborative Learning (CSCL) 2019, Vol (pp. 448-455). Lyon, France: International Society of the Learning Sciences.

Charles, E.S., Lenton, K., Adams, R., Dugdale, M., Lasry, N., **Brouillette, Y.**, Jackson, P.A., Zhang, C. (2020). Designing Error Detection Prompts and Peer Feedback for Physics Classrooms. Proceedings of the Canadian Engineering Education Association (CEEA-ACEG20) Conference. 10.24908/pceea.vi0.14196.

Cooke, S. (Ed). The Letters of Charles Burney. Vol. 4. Oxford: Oxford UP, forthcoming.

Fournier, R. (2020). An interpolation formula and its relation to a polynomial equality of Schur. Mathematical Inequalities & Applications, 23, 459-466.

Fournier, R., Kraus, D., Roth, O. (2020). A Schwarz lemma for locally univalent meromorphic functions. Proceedings of the American Mathematical Society 148, 3859-3870.

Fournier, R., Roth, O. (2020). Jack and Julia. Contemporary Mathematics, 743, 213-216.

Martiniello, N., Asuncion, J., **Fichten, C.**, Jorgensen, M., Havel, A., Harvison, M., Legault, A., Lussier, A., Vo, C. (2020). Artificial intelligence for students in postsecondary education: A world of opportunity. AI Matters, 6(3), 17-29. https://sigai.acm.org/static/aimatters/6-3/AIMatters-6-3-07-Martiniello.pdf

Rebelo, N., **Zembrycki, S.** (2020). Refugee Boulevard: Making Montreal Home After the Holocaust Refugee Boulevard. https://www.refugeeboulevard.ca/.

Smith, M., Philips, M., Fast, E., Ives, N., Lewis, J., Boldo, V., Shea, L., Levine, R. (2019). First Peoples Post-Secondary Storytelling Exchange. https://fppse.net/.

AFFILIATE ORGANIZATIONS

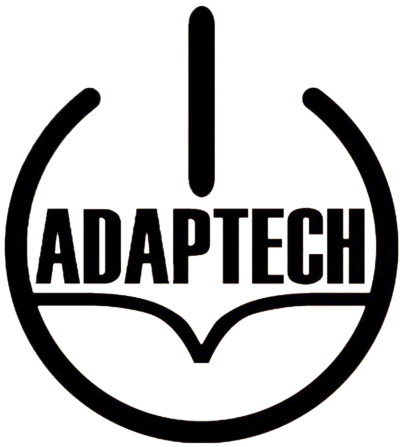
The Adaptech Research Network was established in 1996 and consists of a team of academics, students and consumers. The team is co-directed by Catherine Fichten (Psychology, Dawson College) and Jennison Asuncion.

Adaptech conducts research involving college and university students with a variety of disabilities, including visual, mobility and hearing impairments, psychological, learning and chronic medical disabilities.

Areas of focus are:

- use and accessibility of information and communication technologies in postsecondary education;
- facilitators and barriers to academic success;
- free or inexpensive software useful to students with various disabilities.

The goal is to provide empirically based information to assist and inform decision making that ensures that new policies, and new information and communication technologies reflect the needs and concerns of a variety of stakeholders. The outcomes will be better educational opportunities and learning experiences for college and university students with disabilities.



ADAPTECH

RESEARCH NETWORK

AFFILIATE ORGANIZATIONS

The *Centre de recherche pour l'inclusion des personnes en situation de handicap* (CRISPESH) is a Collegial Center for the Transfer of Technology in Innovative Social Practices (CCTT-PSN), born of a partnership between Dawson College and Cégep du Vieux Montréal.

By focusing on applied research, CRISPESH bridges the gap between research and the community. The transfer of knowledge is also an essential step in the process of making research findings accessible and useful to the community. It entails adapting and implementing strategies of appropriation for the community by means of customized training, conferences and professional development.

Moreover, the Center offers coaching and consultation services to support businesses and organizations. This report highlights the important research activities that contribute to the fulfillment of CRISPESH's mission of inclusion of people with disabilities.

CRISPESH

Centre de recherche pour l'inclusion des personnes en situation de handicap

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