



Polytechnique: At the Heart of a Vibrant French Science Ecosystem

**POLYTECHNIQUE
MONTREAL**

UNIVERSITÉ
D'INGÉNIERIE



**BRIEF TO THE HOUSE OF COMMONS STANDING COMMITTEE
ON SCIENCE AND RESEARCH**

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INTRODUCTION

Founded in 1873, Polytechnique Montréal is one of the leading engineering education and research institutions in Canada and the largest in Quebec in terms of funding for engineering research. Over the past 150 years, Polytechnique Montréal has contributed to the vitality of French-language science and engineering through its training, research and knowledge transfer and mobilization activities, in a way that few others in Quebec and around the world can match.

The top priority of the Polytechnique's roughly 320 faculty members, along with its teaching masters and lecturers, is to have a lasting impact on their students, science and society. They meet this goal by using communication channels that enable them to share the knowledge they have acquired or developed alongside their teams.

The use of French in science and engineering training

In terms of training, nearly all of the hundreds of courses offered in our 12 engineering programs are taught in French. This is also true of the vast majority of certificate programs and other undergraduate continuing education programs, which have grown exponentially in recent years. To give but one example, nine of our 12 short cybersecurity programs are taught in French, and this helps francize a key sector where communication and understanding of terminology for and by the general public are essential. Short training courses for individuals who have already embarked on their career are especially popular among recent immigrants, as these courses enable them to earn a diploma or degree from a higher education institution in Quebec.

Learning activities at the graduate level, where 61% of students are international students with less knowledge of French on average, cross multiple dimensions and are combined with research activities. The language policy under review, in accordance with Bill 14, *An Act respecting French, the official and common language of Québec*, provides for consulting our community on communication practices in our various areas of activity, including in research laboratories and teams. However, as we know, students who do not speak French at the beginning of their master's or PhD programs go on to learn the language, at different rates. Additional resources to help students learn French during their studies would be welcome. Based on our estimates, which should be validated through more in-depth analyses, more than 80% of graduate students settle in Quebec after graduation, where they live and work in French. We therefore believe that the *practice* of research conducted at Polytechnique is a vehicle for francization among our students.

To maximize their impact in the international scientific community, our researchers must share their research findings in the common language, which is English. Last year, 99% of articles published by our professors and teaching masters in peer-reviewed journals were in English. This corroborates the data published in the brief submitted by Jean-François Gaudreault-DesBiens and Vincent Larivière showing that, between 1996 and 2019, “French, on the other hand, went from just under 10% to 1% during the same period” (p. 3). The figure for science communications in conferences drops to 96%. These numbers reflect the dominant position of English in the science, technology, engineering and mathematics (STEM) disciplines. Using English in specialized scientific publications enables faculty members to reach the international community and contribute to scientific advances and the resolution of the most pressing problems.

These figures highlight the importance of events such as the Association francophone pour le savoir (Acfas) conference, hosted by Quebec universities on a rotating basis over the past 90 years. Polytechnique will host the 90th Acfas conference from May 8 to 12, 2023, in partnership with the Université de Montréal and HEC Montréal. Our staff, including faculty members, will organize some 20 scientific colloquia in French—a record for Polytechnique—on a wide range of topics, such as space exploration, the mining industry and drinking water treatment.

Reaching the general public and disseminating science in French

In this brief, we would like to draw attention to one of the most powerful drivers of French-language science: scientific communication and popularization for the general public. In this area, the goals of francizing science and enhancing citizen science literacy go hand in hand. Our researchers’ desire to have an impact on Quebec society makes activities to communicate science to the general public in French essential.

Quebec has a rich and vibrant ecosystem of groups and individuals dedicated to communicating and popularizing science. University communication departments, including the one at Polytechnique, do a lot of excellent work to disseminate research findings to the general public. They devote considerable energy and talent to communicating our faculty members’ expertise and research in French. We produce free massive open online course (MOOC) offerings and videos, design virtual laboratory tours, host events for the general public, produce podcasts, write blogs and open letters, serve as guest experts, develop specialized glossaries, serve as media liaisons and scientific advisors to governments and are tireless Instagram creators. Our students also draw on support from their professors and the institution to participate in various science communication competitions, where they regularly win awards. *La Presse* named Viviane Lalande, one of our PhD graduates, one of the top 15 genuine influencers in 2022. Her YouTube science popularization channel has more than 450,000 subscribers.

Museums, radio and television shows, science exhibitions, scientific cultural agencies, specialized media, influencers dedicated to science popularization and higher education institutions make up an ecosystem where each party plays a role in communicating science and research findings in French. No single one of them can ensure the survival and vitality of French-language science, be it in Quebec or around the world.

However, the federal government is mostly uninvolved in this vital but little-known ecosystem in Quebec. In this respect, institutions such as the province's Fonds de recherche du Québec or the Chief Scientist help make it a global benchmark.

For this reason, we recommend that the federal government work with stakeholders to provide more support for this ecosystem that communicates science to the general public. This support could take many forms:

- Enhancing the Research Support Fund for universities. This grant has a knowledge mobilization component that covers events for the general public where research is communicated and other popularization activities. However, the funding covers only a small portion of the expenses incurred for these activities. Institutions need additional resources to help researchers share their expertise with the general public.
- Enhancing research grants by increasing eligible expenses for knowledge mobilization and dissemination for the general public and end users.
- Funding third-party agencies (Acfas, the Association des communicateurs scientifiques, Québec Science, etc.) dedicated to science culture and communication. Recognizing their role in the vitality of French-language science in Quebec and Canada is critical.
- Supporting radio and television shows and web platforms dedicated to communicating science in French.
- Supporting French youth science camps.

Recommendation: Showcase and provide financial support for the French-language science communication and popularization ecosystem.

CONCLUSION

The recently passed *An Act respecting French, the official and common language of Québec*, requires Quebec funding agencies to link research funding to francization: “Every agency of the civil administration that, in the exercise of its functions, offers financial assistance measures for research in any form, including fundamental research, shall see that such measures, taken together, contribute to supporting and enhancing research in French” (section 88.0.20). Universities will no doubt have to adjust, while adhering to the principles of academic freedom. In this brief, we submit that promoting research in its broader sense includes presenting it to the general public and that this role is fulfilled by a vibrant ecosystem in which universities such as Polytechnique have a key role to play. We believe that addressing the issue of the place of French in science means taking a broader view of what constitutes research activity to include communicating findings to the general public. This will enable us to meet the twofold goal of francizing scientific activity in Quebec and sharing the latest scientific breakthroughs with the general public, who has to a great extent funded them.

We also share some of the recommendations made by various organizations during this consultation. The following recommendations are noteworthy.

Recommendation 3 in the brief submitted by Vincent Larivière and Jean-François Gaudreault-DesBiens from the Université de Montréal: “The federal government must also ensure that the visa applications of international students from francophone countries are evaluated fairly in relation to those from other countries. Unequal visa opportunities for francophone students—mainly from Africa—predominantly affects French-language universities by reducing access to their main pools of international students.”

We find it hard to imagine losing out on the talent and potential of hundreds or even thousands of prospective students and citizens. Polytechnique welcomes these students in all its programs and at all levels. In particular, the discrepancies in student visa acceptance rates in francophone African countries compared to anglophone countries are difficult to explain and should be eliminated.

Recommendation 2 in the brief submitted by UQAM: “That the government demonstrate equity and exemplary support for research in French, whether within its own institutions or through external partnerships with universities or higher-education institutions. And that the government guarantee the opportunity for francophone researchers to be able to present the results of their research in French to the federal government and to be able to pursue any collaboration with the government in French.”

The federal government invests heavily in research, and we believe it is essential to be able to communicate in our language of choice, not only with the granting agencies but also with all departments and the machinery of government. The research conducted in francophone universities and by francophone scientists across all disciplines must find a sympathetic ear among public servants and elected officials. Constant vigilance in this area is required. Polytechnique’s support for and some of our professors’ participation in the new Réseau francophone international en conseil scientifique show how important we think it is to communicate science to government representatives in French.

Recommendation 4 in the brief submitted by Jean-François Gaudreault-DesBiens from the Université de Montréal on the discoverability of French-language content: “The federal government must also increase the discoverability of French-language content. The recommendation algorithms of the various platforms are biased in favour of English-language content, which is easier to find. The federal government must invest in solutions to these algorithmic biases, which would restore the linguistic balance in content discoverability. In doing so, it would not only contribute to the vitality and dissemination of science in French in Canada but also internationally. Anything to counter these algorithmic biases would indeed have an impact on the global francophone community, of which Canada is a leader. This would also be in keeping with the spirit of the UNESCO *Universal Declaration on Cultural Diversity*, of which Canada was a strong proponent when it was adopted.”

The issue of the discoverability of French-language content was also addressed in the brief submitted by Consortium Érudit.

Contact

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