

## Oser. Transformer (Dare. Transform)

### 2018–2022 Strategic Planning — Summary for Canada Research Chairs (CRC) and Canadian Foundation for Innovation (CFI)

#### PREAMBLE

CRC and CFI programs are an important element for the success of the 2018-2022 Strategic Plan of Université de Sherbrooke. Entitled *Oser. Transformer* (Dare. Transform), the plan was the result of consultations with more than 5000 persons and received the stamp of approval from the Université's highest governing bodies. The complete plan is available at the following address: <https://www.usherbrooke.ca/recherche/fr/organisation/plan-strat/>

Research at the Université has many distinctive features. In many sectors, translational research, which involves the continuum from basic research to knowledge translation, is clearly one of our strengths. In fact, the research carried out at the Université is reputed for influencing practices in a variety of settings and contexts.

Interdisciplinarity is also a characteristic that enables some of our research groups to excel in their collective achievements. The development of certain technology platforms and the acquisition of major scientific infrastructure shared by several research groups over the last few years have also accelerated discoveries. While some faculty members and their teams have significant reach, including in popular media, we all too often still hear that Sherbrooke scientific breakthroughs and discoveries are well-guarded secrets.

As a general rule, modern research should focus on responding to major social issues and society's specific needs. That would justify its relevance and facilitate funding. Such research very frequently makes use of multidisciplinary and interdisciplinary approaches because major discoveries often lie at the boundary between disciplines. Nevertheless, researcher excellence and engagement are crucial in pushing back the boundaries of knowledge.

Three elements figure prominently in research and graduate studies at Université de Sherbrooke: sustainable development; the principles of equity, diversity, and inclusion; and partnering.

- A. Sustainable development is development that meets the needs of individuals and society without compromising the ability of future generations to also meet their own needs.<sup>1</sup> Sustainable development is a sine qua non fundamental principle of all of our research.
- B. Equity, diversity, and inclusion are fundamental values in building high-quality research teams. Each individual carries his or her own specific baggage. Coming together as a team provides different perspectives in solving today's most complex issues.
- C. Developing a network of high-quality partners—academic, public, and private—is a guarantee of success for research firmly rooted in society. This makes it possible to foster applied knowledge-mobilization applied knowledge-mobilization and the changes to policies and practices required for the advancement of society.

---

<sup>1</sup> *Report of the World Commission on Environment and Development: Our Common Future* (Brundtland Report). World Commission on Environment and Development. United Nations (1987). <http://www.un-documents.net/our-common-future.pdf>

## UNIFYING THEMES

With the goal of accelerating research development at the Université and to enable the community to solve complex issues requiring multidisciplinary approaches and having a significant societal repercussions, the new management team spearheaded an exercise in 2017 to identify six unifying themes.

The unifying themes also had to speak to the Université's research community as well as government bodies, external partners, and the general population. A unifying theme is a institutional commitment adhered to by a critical mass of researchers working to push back the boundaries of knowledge. It is important to underscore that the purpose of identifying unifying themes in no way aimed at having original and individual research take a backseat. Indeed, it was to promote the creation of intersectoral and inter-faculty groups. A unifying theme is not limited to technical aspects. On the contrary, it must take into account the social responsibilities and societal needs associated with this research work.

### **Togetherness: Culture, Plurality, Governance, and Equity**

Togetherness can be described as the capacity and consent of socially and culturally diverse people to harmoniously share their living environment. Societal togetherness rests on mutual respect, acceptance of the plurality of individuals and opinions, interactions rooted in openness and cooperation, caring relations, and the refusal to ignore or harm one another<sup>2</sup>. Societal togetherness allows for affirming different identities, valuing sociocultural diversity, and ensuring equity in living and work environments as well as within public services.

*Keywords* Diversity. Vulnerable populations and clientele. Social and political organization. Social governance. Publishing and reading. Ethics. Secularism and religion. Plurality. Minority groups. Sex and gender. Interculturalism. Cultures and cultural knowledge. Social cohesion. Normativity. Dispute prevention and resolution. Quebec literature. French language and francization. Social services. Responsible management. Public policy.

### **Digital Age: Intelligent Organizations and Training**

Rapid expansion, broad accessibility, and the universal adoption of digital technologies impact how we think, reflect, teach, train, work, interact, and communicate.<sup>3</sup> The digital world, including big-data analysis, can indeed be found in every aspect of life, affects individuals of all ages, and raises many challenges in training channels and all way up to social and economic effects.

*Keywords* Cultural, educational, and technological aspects of the digital era. Use of social media. Digital literacy. School success and perseverance. Artificial intelligence. Teaching and learning. Open data. University pedagogy and teaching training. Economy and the tax system. Integrated and intelligent systems. Ethics and private life. Responsible management.

### **Innovative Materials / Processes and Quantum Science**

Intelligent materials are able to react to external stimuli in order to adapt to changes in environmental conditions, perform a task, or fulfill a specific function.<sup>4</sup> Innovative processes play an increasingly important role in developing cutting-edge technologies and in our society. Quantum science, which fall

---

<sup>2</sup> Graines de paix. Solutions éducatives pour une paix durable. [http://www.grainesdepaix.org/fr/ressources-de-paix/dictionnaire-paix-education/vivre\\_ensemble\\_bien\\_vivre\\_ensemble](http://www.grainesdepaix.org/fr/ressources-de-paix/dictionnaire-paix-education/vivre_ensemble_bien_vivre_ensemble)

<sup>3</sup> Government of Canada, *Building Digital Skills for Tomorrow*. <https://www.ic.gc.ca/eic/site/028.nsf/eng/00041.html>

<sup>4</sup> Zhao, Y, "CPH 715 Conception de matériaux intelligents." Course notes. Université de Sherbrooke. [https://www.usherbrooke.ca/physique/fileadmin/sites/physique/documents/Plan\\_de\\_cours/cph715.pdf](https://www.usherbrooke.ca/physique/fileadmin/sites/physique/documents/Plan_de_cours/cph715.pdf)

between basic and applied sciences, will revolutionize materials, technologies, and the nature of information as well as how it is processed and transmitted.

**Keywords** *Information and quantum mechanics. Nanotechnologies and technological innovations. Computer systems. System automation. Composites and material advances. Development of innovative materials. Medical imaging. Information processing. Artificial intelligence. Microelectronics. System miniaturization and performance improvement. Quantum technologies.*

## The Environment and Climate Change

As the century begins, climate change is considered the most powerful factor affecting the planet's ecosystems and our lifestyles. Sustainable development refers to the creation or transformation of environments or settings adapted to different contexts as well as the implementation of economic and sustainable solutions to ecological and societal problems without compromising natural and social environments.

**Keywords** *Sustainable development. Sustainable infrastructure and advanced materials. Environmental, social, and economic aspects associated with the use of natural resources. Geomatics. Ecology and ecosystems. Hydrology. Energy efficiency.*

## Health: Promotion, Prevention, and Precision Approaches

Public health deals with the organized efforts deployed by a society to keep its population healthy and avoid injury, chronic diseases, psychological problems, and premature death. It consists of a blend of programs, services, and policies aimed at protecting and promoting physical and mental health as well as the positive social adaptation of individuals.<sup>5</sup> Precision approaches aim at delivering the right treatment or intervention at the right time to the individual as a whole. From a standpoint of individual accountability and considering the importance of different forms of prevention, the development of personalized interventions adapted to populational and personnel contexts from an interdisciplinary perspective stands out as a major challenge.

**Keywords** *Mental and physical health. Biological and social determinants of health. Organizational health. Risk behaviors. Health-care organization. Health ethics and legislation. Prevention and health promotion. Rehabilitation. Primary health care. Interdisciplinary and integrated health-care approaches. Maladjustment and social intervention. Neuroscience, pharmacology, microbiology, endocrinology, genomics, medical imaging, etc. Basic understanding of biological mechanisms.*

## Population Aging

Significantly improving living conditions and health care help increase life expectancy. One of the consequences is a growing number of the elderly with or without chronic diseases. From this standpoint, population aging and the scope of the changes it involves can lead us to challenge our approaches and might even prove to be an opportunity. Preventing chronic diseases and cognitive decline as well as promoting health maintenance and independence are solutions. There are also many societal stakes related to aging. Better understanding and acting on the physical, social, organizational, and political environments as well as their interactions are essential to promoting social participation and better aging.

**Keywords** *Life-span approach. Active aging. Healthy lifestyles. Adapting the living setting and society. Ethical, economic, and legal aspects of aging. Chronic diseases associated with aging. Independence. Environment and adapted services. Neuroscience and cognition. Individuals in vulnerable situations. Life trajectories.*

---

<sup>5</sup> Leatherman S. and Sutherland K. *Quality of Healthcare in Canada: A Chartbook*. Ottawa, ON. CHSRF. 2010. [https://www.cfhi-fcass.ca/migrated/pdf/chartbook/CHARTBOOK%20Eng\\_June\\_withdate.pdf](https://www.cfhi-fcass.ca/migrated/pdf/chartbook/CHARTBOOK%20Eng_June_withdate.pdf)

## COLLABORATIONS ET PARTNERSHIPS

Université de Sherbrooke understands that playing a leadership role in bringing innovation to the private and public sectors, through entrepreneurship and partnership, requires a highly integrated interdisciplinary research ecosystem and that we need to bring together students and professors from various backgrounds to develop successful ventures. To succeed, Université de Sherbrooke has deployed a global “Innovation, Partnership and Entrepreneurship” (IPE) strategy with three clear goals over a 10 year period (2016-2026): (1) to triple the amount of research funding from the private sector; (2) to double the number of inventions that reach a commercialisation phase; and (3) to double the number of start-up companies launched each year in ACET, the Université’s Accelerator for the Creation of Technological Enterprises. To achieve these three goals, we structured the IPE strategy around several of our existing strengths so that we could concentrate our efforts on key sectors such as quantum technologies, information technologies, smart transport, renewable energy and medical technologies while, at the same time, work upstream to create more interest for scientific careers in primary and high school students and spark their entrepreneurial spirit.

## PLANNING AND APPROVAL PROCESS

The 2018-2022 Strategic Plan helps to guide the Université in its decision process for major research programs such as the Canada Excellence Research Chairs (CERC), the Canada Research Chairs (CRC) and the Canada Foundation for Innovation (CFI). These programs represent excellent opportunities for the Université to increase its research and teaching capacity, to recruit and retain the best talents, and to ensure our partnerships benefit the population of Québec and Canada.

All our CRC are attached to at least one unifying theme, as shown in Table 1.

Table 1. Canada Research Chairs Distribution as at September 1, 2018						
UNIFYING THEME						TOTAL
Research Area	Innovative Materials/ Processes and Quantum Science	Environment and Climate Change	Health: Promotion, Prevention, Precision Approaches	Togetherness: Culture, Plurality, Governance, and Equity	Population Aging	
Sciences and Engineering*	8	6	2			16
Health			10		2	12
Social Sciences and Humanities				4	1	5

\* Plus one CRC Tier 2, to be allocated to a unifying theme, for a total of 17 CRCs in Sciences and Engineering.

The Office of the Vice-President for Research and Graduate Studies ensures that the Université is compliant with the rules of the various agencies’ programs and, in close collaboration with the departmental and faculty governing bodies, allocates the CERC, the CRC, and the CFI envelopes. In addition to the strategic direction provided by the unifying themes, the allocation of CRC must reflect the Université’s commitment to an equitable, diverse and inclusive workplace that will foster the creation of an excellent, innovative and impactful research ecosystem. Transparency in the allocation of CRC is strengthened by the Université’s *Balises institutionnelles pour les Chaires de recherche du Canada*, which include a detailed description of the recruitment process and the implementation of recognized best practices. The Université’s *Plan d’action d’équité pour les programmes interorganismes (2017-2022)* focuses on improving the governance, transparency and monitoring of equity and diversity within the chair programs and describes the actions the Université has, and intends to, put into place to address the underrepresentation of the four designated groups (FDGs)—women, persons with disabilities, Indigenous peoples and members of visible minorities. Each faculty that hosts CRC is expected to contribute to reaching the institutional targets, which the Université expects to meet by the end of 2019, and then maintained or exceeded in the following years. Representation targets for women are more easily determined because statistical data are available for all three sectors of research (NSERC, SSHRC, CIHR). Progress towards reaching the targets are public and are updated regularly on the Université’s web site <https://www.usherbrooke.ca/recherche/fr/organisation/equite/>