



# Integrated Thinking, Integrated Learning: Changing Our Ways for Changing Global Realities

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## ABSTRACT

The author strongly believes the complexity of our natural world and current societal issues cannot be addressed without interdisciplinary insights that can emerge only if formal education is allowed to go beyond the traditional silos of knowledge and practice. She describes how the Quebec Education Program, started 10 years ago, is based on competencies and integrated learning, thus transcending the boundaries between subjects. She discusses how Education Faculties have adapted to align teacher education with the current educational reform. Finally, she questions whether universities will be ready to receive this new generation of “transdisciplinary thinkers” who will soon be at their doors.

## Introduction

Scholarship bears little value unless it can be translated into meaningful community contributions. In fulfilling their mission of advancing knowledge, institutions of higher learning must therefore also ensure that they foster and sustain this commitment. The vehicle of choice remains Education.

Great institutions of higher learning throughout the world are rooted in centuries of scholarship involving reflection and discovery, serving to advance knowledge, contribute ideas and concepts, and forge theories. The end result of this has been organized bodies of knowledge recognized as academic disciplines, the acquisition of which was collectively embraced in a formal course of learning. To a

great extent, the framework for our current institutions of higher learning evolved from European and later North American Learned Societies, such as the Académie des Sciences created by Louis XIV, the British Royal Societies, or the American Philosophical Society, whose activities brought together scholars to share ideas or lines of inquiry with a view to advancing disciplines, or fields of knowledge. The outcome of such debate was, among other things, intended to contribute to offering solutions to social problems. The perspective of a shared civic responsibility for the organization and promotion of research, as well as the dissemination of knowledge, contributed to the development of the North American research university as we know it today. In the university, historically, disciplinary societies established the standards for intellectual and scholarly credentials and provided the pool for the appointment of academic staff.

Times change, however. While remaining true to their mission to advance knowledge, to be recognized as applying the highest standards of scholarship, institutions of higher learning internationally face a very different world today than that referred to above. The changing global realities of the 21<sup>st</sup> century demand attention. High-stakes societal issues, such as climate change, global food shortages, and the need to reconcile energy consumption with energy supply, are pressing. We are called upon to understand and control the emergence, the transmission, and the global impact of new pathogens. We share a responsibility to contribute to the debates on issues ranging from biomedical ethics, to optimizing human development and quality of life. At the same time, new emerging technologies are changing the global landscape, as well as the scope of potential solutions. Yet, while advances in information and communication technologies have radically impacted and continue to transform our world, our conceptual approaches may not have followed.

None of these challenges can be addressed through a single disciplinary lens, but call upon us to draw on elements from the natural sciences, the social sciences, the humanities and the arts. The complexity of our natural world and of current societal issues cannot be addressed without interdisciplinary insights that can emerge only if formal education is allowed to transcend the traditional silos of knowledge and practice.

## Changing Our Ways for Reshaping Minds

The collaboration of various single disciplines, each one making a contribution towards solving a problem, the borrowing of technical knowledge from one

discipline to another is not new. Such “multidisciplinary” approaches have indeed been practiced for some time, and examples abound. In such instances, one discipline typically leads the way toward a solution, borrowing from other fields in its development and application. While this approach may provide a timely resolution for a particular issue, it has done nothing to forge approaches to addressing the broader, multifaceted challenges noted above. What is needed is something which is of greater value than the sum of the parts. For this, we turn to “interdisciplinary” or “transdisciplinary” education or research, wherein two disciplines coexist and grow together, integrating concepts and method, eventually giving rise to new research fields or disciplines. Such an approach, however, faces important barriers—personal and institutional—that can impede or even prevent transdisciplinary activities.

## The Quebec Education Program—A Model to Follow

Reflecting its commitment to the central role of schools in fostering the development of intellectual skills and knowledge necessary to adequately respond to a rapidly changing 21<sup>st</sup> century environment, the Quebec government has carried out considerable reflection on the future of education in Quebec. This was done through briefs, reports, and surveys on how schools can best serve society, with a view to making recommendations for adapting its educational system to the new and evolving sociocultural realities of the 21<sup>st</sup> century. The 1994 report from the Conseil Supérieur de l'Éducation, *Preparing our Youth for the 21<sup>st</sup> Century*, for example, urged the education system to undergo transformations. That report was followed in 1996 by the Commission for the Estates General on Education (Ministère de l'Éducation, 1997), the outcome of which was instrumental in paving the way for a revised educational policy in Quebec. The philosophical foundation of the proposed new approach was grounded in the view that optimal learning environments are those which encourage the active participation of the learner in the construction of knowledge. The curriculum review targeted essential learnings for early 21<sup>st</sup> century students, and proposed the diversification of educational options to meet a wide range of needs and interests and a more flexible organizational model.

The new educational approach, what is referred to as the “Quebec Education Program (QEP),” is based on the attainment by students of “competencies,” defined as “a set of behaviours based on the effective mobilization and use of a range of resources” (Ministère de l'Éducation, 2001). In this framework, attainment of a competency is not subject-specific, but rather reflects the student's ability to integrate elements acquired in various learning activities or settings. Competencies “...do not

necessarily follow a subject-specific logic. This requires that the school transcend the boundaries between subjects in order to help students perceive the connections between their various learnings" (p. 5). The QEP recognized that integrated learning and the development of competencies also occurs across curricular areas, and can be related to intellectual, methodological, personal and social or communication-related competencies, for example. In responding to its mandate to "prepare students to contribute to the development of a more democratic and just society" (p. 2), the Quebec Education Program was indeed proposing the building blocks to scaffold a "transdisciplinary" model of education.

Implementation of the educational reform involved not only reviewing the alignment, the complementarity, and the overlap between various subject areas, but it also redefined the time frames for learning. Rather than yearlong units, the system was revised to comprise cycles that are much longer than one school year. More importantly, however, it required the engagement of all stakeholders and participants in its commitment to "transdisciplinary learning." What is often referred to as the Quebec Educational "Reform" was introduced progressively a decade ago, starting with preschool and moving through the three two-year elementary school cycles and three secondary school cycles (Ministère de l'Éducation, 2004). Today, some 10 years after its inception, competencies have been operationalized so that they may be monitored, and new cross-curricular approaches have been fostered in schools. A new generation of secondary school graduates educated through a transdisciplinary model is about to reach our institutions of higher learning.

In working to achieve success in a transdisciplinary approach, it is important to foster the interface of several communities of knowledge such that the appropriate environment, climate and supporting structures may be shaped and fostered. The first step is to ensure that the qualities defining and promoting cross-disciplinary collaborations are well communicated, understood, respected, and supported. Second, it is essential that there be commitment at all levels—local, national and international—to ensure that the knowledge acquired may be transformed into meaningful actions with positive impact. Facilitating this involves minimizing barriers of all sorts, including personal, disciplinary, and political. In our universities, barriers are located in approaches to teaching and professional preparation, research and scholarship, and institutional administrative structures and practices. Students and faculty members stepping out of the comfort zone of their disciplinary world to engage in "transdisciplinary" education and research face those challenges noted above. They also struggle to gain support for funding or dissemination of work that falls outside traditional disciplinary boundaries. Measures facilitating transdisciplinary

approaches in universities could include allowing students to work with teachers from different disciplines, supporting team teaching, providing opportunities for students to acquire mentors in multiple disciplines, and fostering cross-disciplinary, cross-curricular investigation of phenomena and assessment of this work. This approach also requires adapting administrative structures and practices to allow for collaboration across disciplinary units, favoring a flexible approach that accommodates the cross-disciplinary sharing of ideas. Similarly, funding or publication agencies must adapt to provide better recognition of transdisciplinary approaches. This can be done through, for example, a less discipline-specific selection of peer reviewers.

The barriers faced by the audacious QEP policy advance were not much different from those identified in a report by the National Academy of Sciences (2005) for transdisciplinary research in higher education. Completely engaging with a new system requires, in effect, a dedication to and belief in process, and accurate assessment of a system such as this can only occur with the passage of time. Again, like in any form of transdisciplinarity, successful implementation of the QEP depends upon participants learning the conceptual framework, the language, the culture and the methods of the other discipline (or range of disciplines in this case). It requires a commitment to moving towards the objective, a fostering of the conditions that enable it, and perseverance and time to achieve it.

Given their responsibility for preparing teachers for the provincial education system, Faculties of Education of Quebec have been actively involved not only in informing the QEP but also in fostering in their university programs and in their teacher education students the transdisciplinary approach required by the QEP. The integrated learning approach currently mandated as a model for teacher education in Quebec, for example, informed the government's decision to extend the undergraduate teacher education degree to a four-year program.

Driven by the need for alignment of future teachers with the educational reform currently in place, Quebec's Faculties of Education have actually moved ahead and paved the way for transdisciplinary thinking and integrative approaches to formal education. Even within the constraints of traditional administrative structures and procedures, they have found ways to create an environment that promotes and facilitates integrated learning, working toward developing this in partnership with the broader educational system. The challenge inherent in successfully shifting from discipline-based thinking to a transdisciplinary approach is such that few organizations attempt it. Businesses that have successfully changed are hailed as heroes. Yet, with much less bravura and applause, our educational system has dared to take up

the challenge. As is always the case, time and sustained practice will surely lead to continued improvements in expertise in cross-disciplinary teaching and learning. Nonetheless, pre-service and in-service teachers of Quebec, in collaboration with Faculties of Education, are making headway in fostering change. They deserve to be commended for it. A new generation of transdisciplinary thinkers will be knocking on doors of Universities within the next three years. Will our universities be ready to receive them? Will they work to support them in achieving their full potential and, in particular, will they do so through the very transdisciplinary approach seen by many as necessary in the fostering of solutions for tomorrow? It may be the case that institutions of higher learning should turn to the Quebec educational system for inspiration and leadership. True to their mission, Faculties of Education could be leading the way.

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Dr. Perrault has been instrumental in the implementation of major undergraduate and graduate academic program revisions, academic renewal as well as fostering cross-disciplinary interactions across several university faculties. She served as McGill senator between 2001 and 2005, contributed actively to several subcommittees of the Senate and has chaired or served on numerous university academic, selection and administrative committees.