

*Editorial***Beyond Conventional Dialogues: Transdisciplinary Research at the University of Calgary**

Ayoola Oladele

Chief Editor and Publication Chair

The contributions compiled in this issue resist easy categorization and, hence, were not assembled around a predetermined theme. They arrived independently, from researchers working across biomedicine, environmental engineering, education, community health, artificial intelligence, and the humanities. What emerges, nevertheless, is a coherent range of methods, disciplines, and empirical contexts that reflect the uniquely transdisciplinary research environment of the University of Calgary. Yet, beneath this diversity also lies a shared orientation and collective push against the boundaries that have long defined conventional scholarship across different fields. It is in that spirit of productive discontent that we introduce twenty-seven (27) recently completed and ongoing graduate students' research presented at the 2026 Peer Beyond Graduate Research Conference.

***Innovative Technology in Response to Urgent Problems***

A striking number of papers in this issue deploy advanced computational and sensing technologies not as ends in themselves, but in direct response to pressing societal challenges. The section opens with Ali and Du's evaluation of low-cost volatile organic compound sensors mounted on unmanned surface vehicles for detecting oil spills and contamination, a methodological contribution of immediate environmental importance. In the same vein, Shakeri and Far's deep reinforcement learning brought to bear on molecular design for drug discovery, while Leahy turns image processing techniques toward the detection of dwarf galaxies in NGC 5128. Rezaei et al. provide a life cycle assessment of hydrogen production pathways across Canada, proposing methane pyrolysis as a transitional low-carbon solution for the energy sector. These are not adjacent projects, but they are connected by a disposition toward new discovery. Two further papers examine artificial intelligence from a governance and assessment perspective: Shahin interrogates the institutional conditions for the sustainable adoption of AI in Canadian higher education, while Mikaeili proposes a principled framework for human-AI collaboration in writing assessment. Collectively, these contributions indicate fields and research practices that have moved past early-adoption enthusiasm toward more rigorous and critical engagement with what intelligent systems can and cannot do.

***Bodies, Systems, and the Biology of Vulnerability***

The biomedical contributions to this issue are unified by their attention to the body under stress–microbial, inflammatory, neurological, and social. Studies examining the effects of human serum on *Pseudomonas aeruginosa* physiology, the role of complement activation and CD163 in renal inflammation, and AI-2-mediated quorum sensing in gut microbiome-immune dysbiosis, by Cui, Alkadri et al., and Hawkins, respectively, probe the mechanisms by which biological systems respond to disruption. Neuroinflammatory modulation following mild traumatic brain injury by Salim et al., and the maternal transmission of childhood trauma through

breastfeeding by Paulucio et al., extend this lens toward more visible forms of human vulnerability. What distinguishes these papers, as a cluster, is their insistence on mechanisms rather than just pathological descriptions. They seek to advance our understanding of the pathways through which harm propagates and, implicitly, through which intervention becomes possible.

### ***Community, Equity, and the Ethics of Presence***

The largest and most diverse grouping in this issue comprises papers that take community seriously as both a site and a subject of research. Deloria et al.'s exploration of racialized young sibling caregivers in Alberta, Subedi's study of South Asian communities navigating mental health and addiction services, Hyder et al.'s assessment of immigrant populations for liver health literacy, and Lecorre-Moore's investigation of how arts-based research can strengthen identity and unity within the Calgary's Francophone community, present communities as constituencies whose experiences generate knowledge that formal systems have too often overlooked. The Brain Climate and Equity Collaborative by Laroyia and Oboh extends this framing to the intersection of climate change and brain health, arguing that equity must be built into the architecture of climate resilience from the outset. Methodologically, these papers, including those by Hyder et al. and Raihan et al., are notable for their reliance on participatory and co-design research approaches developed in genuine partnership with communities. This section is wrapped up by Zanjani's complementary framework on participatory placemaking for accessibility, emphasizing the built environment as not merely a backdrop to social life but a medium through which inclusion or exclusion is actively produced.

### ***Institutional Frameworks, Workforce Dynamics, and Professional Pathways***

A new and critical axis of research in this collection turns its analytical gaze inward toward institutions, labour structures, and the pathways that shape professional fields. This cluster addresses the operational mechanics of organizations and the well-being of the people within them. We see this in a scoping review proposal by Taylor et al., aimed at mapping moral injury within organizations, shifting the conversation from individual burnout to structural workplace trauma. In a parallel investigation of institutional adaptation, Carson explores the need for preservice teachers to relearn mathematical concepts within the STEM course for proper student engagement. Similarly, Gierus and Nogueira, through a sociocultural perspective, examine the underlying factors driving scholars into quantum research and why there is a limited number of practitioners in Canada. The account of implementing an electronic patient-reported outcomes system in cardiac care in Alberta by Dalton emphasizes the need for integration of well-designed interventions to identify eligible patients and minimize staff burden. This interrogation of inherited frameworks concludes in the classroom, where Mamadaliyeva urges early childhood educators to rethink classroom order by "staying with uncertainty" rather than enforcing rigid control that often constrains the learning process and development of the pupils. Together, these authors remind us that innovation cannot succeed without a critical understanding of the infrastructure and human capital that support it, and human development occurs mostly in spaces unconstrained by conventional frameworks.

### ***Voice, Narrative, and the Limits of the Tellable***

Several contributions approach their subject matter through narrative, by attending to what is said and the conditions under which speaking becomes possible. The paper by Ghasemi titled "Lives That

Cannot Be Told” engages directly with the historiographic selectivity, epistemic, and ethical stakes of how structural criteria shaped who is represented and their narratable lives in historical records. Zhu and Moules’ hermeneutic exploration of women’s experiences of infertility opens an important space for the emotional, financial, and existential complexities of this journey, which quantitative medical instruments consistently miss. Storytelling as a vehicle for community visibility anchors the study of Calgary’s Francophone community, while a close reading of the production ecosystem of *The Chosen* by Seabra illuminates how faith-based media can overcome the systemic barriers that have long impeded its production and distribution. These papers share convictions that meaning is not simply extracted from human experience but co-constructed through the act of narration, and careful attention to narrative is itself a form of intellectual responsibility

What this issue reveals, read in its entirety, is a research community that has not retreated into the safety of narrow specialization. The research presented here seeks to address difficult questions, to work with communities rather than on them, and to take seriously the forms of knowledge that do not easily fit traditional academic endeavours. That willingness is, we believe, what interdisciplinary inquiry is for.

We are grateful to each contributing author for entrusting their work to this journal, and to the reviewers whose generous and constructive engagement has supported every submission.