



Growing Snowflakes—Unity in Difference

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Abstract:

An image of a snowflake adorns the cover of this issue. It also serves as a guiding metaphor for our editorial discussion. The twelve articles in this issue have been gathered over two years and come from varying perspectives on a variety of topics pertinent to the study of curriculum. Each article was developed using a distinct research practice. Like snowflakes, each article is unique, nuanced with individuality. And yet, like snowflakes, there are recognizable patterns that repeat across the articles of this issue. As we read about issues of colonial alienation of First Nation communities, COVID restrictions, financial literacy gaps and student distress, we observe recurring psychological and social processes. And these processes show fascinating parallels to the molecular dynamics of snow crystal formation! For example, we see the impact of the environment on the process of learning. We see the benefit of an interactive, adaptive, relational pedagogy centred on care. And we see the value of viewing things from a different perspective, through a different taxonomy. The metaphor of the snowflake shows us richness in diversity, and it also reminds us that a genuine conversation will reveal unity across difference.

Keywords: curriculum studies; metaphor; snow crystals; unity; diversity; sameness; difference; improvisation; adaptation; environment; relational pedagogy; meaning; well-being; arts-integrating inquiry; epistemology

Cultiver des flocons de neige : l'unité à travers la différence

Résumé :

L'image d'un flocon de neige orne la couverture de ce numéro. Il sert également de métaphore directrice pour notre discussion éditoriale. Les douze articles de ce numéro ont été rassemblés sur une période de deux ans et proviennent de perspectives diverses sur une variété de sujets pertinents à l'étude du curriculum. Chaque article a été élaboré à l'aide d'une pratique de recherche distincte. Tels des flocons de neige, chaque article est unique, nuancé d'individualité. Et pourtant, comme les flocons de neige, des motifs reconnaissables se répètent dans les articles de ce numéro. Alors que nous lisons les problèmes d'aliénation coloniale des communautés des Premières Nations, les restrictions liées à la COVID, les lacunes en matière de littératie financière et la détresse des étudiants, nous observons des processus psychologiques et sociaux récurrents. Et ces processus présentent des parallèles fascinants avec la dynamique moléculaire de la formation des cristaux de neige! Par exemple, nous constatons l'impact de l'environnement sur le processus d'apprentissage. Nous voyons les avantages d'une pédagogie interactive, adaptative et relationnelle centrée sur la sollicitude. Et nous voyons l'intérêt de voir les choses sous un angle différent, à travers une taxonomie différente. La métaphore du flocon de neige nous montre la richesse de la diversité et nous rappelle également qu'une conversation authentique révélera l'unité à travers la différence.

Mots clés : études curriculaires; métaphore; cristaux de neige; unité; diversité; similitude; différence; improvisation; adaptation; environnement; pédagogie relationnelle; signification; bien-être; recherche axée sur les arts; épistémologie

If one is not responsive and attentive to the other in the musical conversation (i.e., improvising), the jazz musician is regarded as not living well with others.

(Jardine, 2023, this issue)

Kenneth Libbrecht is a physicist and artist, who studies and designs snowflakes—which he notes are more accurately termed snow crystals. One of his photographs graces the cover of this issue. We reached out to Dr. Libbrecht because we found his work presents many connections to this collection. We think this issue is well depicted by the image and metaphor of a snowflake.

We also like the idea of *metaphor* itself. Metaphors are cognitive devices; they help us think, assert theorists of language such as George Lakoff and Mark Johnson (1980), or Hannah Arendt (1971/1978). Metaphors can be quite ingenious—as when Franz Kafka (1915/2013) famously describes social alienation through a man’s metamorphosis into a monstrous insect, or when John Donne (1633/n.d.) hilariously compares love’s ardour to a blood-sucking flea. However, metaphors are universal human experiences, born of our embodied existence (Lakoff and Johnson, 1980). Without our even noticing, they slide into everyday communications, such as when we talk about feeling up or down, small or tall, full of oneself or empty, or blue, or galled, or heavy-hearted, or wet behind the ears.

Metaphors have also been indispensable to the conception of education and curriculum. Curriculum researchers, building from foundational work of Bill Pinar (e.g., Pinar, 1974), frequently play with the notion of curriculum as a *course*. Consider some of the possible metaphors that this notion lends to: curriculum as a race course; as an obstacle course; as a mapped itinerary; as a walking route; as a life path; or as the view to be gained after completing the ascent. These examples show that the most valuable metaphors are not necessarily the most clever, but, rather, the most capacious, those which create strong connections between the sensory and the conceptual, and which offer comparisons that hold under extension.

How does the image of a snowflake serve us here, as we describe and present this double issue, at the end of 2023? Let’s start with the most obvious grounds: that even as snowflakes are immediately recognizable by their six-sided nature, no two snowflakes are alike. So it is with the articles of this issue: all share the topic of curriculum study, and yet each is as unique as a newly formed snowflake.

Libbrecht has developed an educational website, [SnowCrystals.com](https://www.snowcrystals.com), that covers all matters related to snow crystals. It is fascinating to read what he says about the science and art of snowflakes. His comments lend more grounds to our metaphor.

As a scientist, Libbrecht (n.d.; 2021) tries to figure out why snow crystals form as they do. Libbrecht engages models of molecular science to show why snowflakes are always six-sided. He explains that when water molecules freeze, their atomic valences result in hexagonal formations which repeat through the lattice that is a crystal (see Libbrecht, n.d., “Snowflake Science” section). To

study snow crystals, Libbrecht both observes them in the wild and grows them in the lab. Libbrecht considers how the shape of an individual snowflake is impacted by various elements of its environment, such as temperature and humidity, as well as obstacles or damaging elements in its path as it falls toward the ground.

Likewise, all the articles in this issue have been formed in different places and under varying circumstances. Nonetheless, they show many common features and share topics in common. Let's look at the groupings, and at the articles themselves, and notice the course of their creation and the resulting play of sameness and difference.

The articles in this issue are arranged in groups of three. The first set of articles addresses narrative both as a research method and as a curriculum fundamental. Yet, the articles in this set consider different phenomena and so employ varying narrative methods. These three articles show that all learners—whether they be students, teachers or researchers—are like snow crystals: their growth is affected by the diverse, and sometimes adverse, conditions they encounter.

- i) Nikki Yee and Alicia Hiebert engage a fictional narrative to acknowledge harms of colonial practices, all the while demonstrating their belief that Indigenous and Western pedagogies can be reconciled.
- ii) Katelyn Jardine employs a hermeneutic inquiry to interpret teaching itself as hermeneutic, as an experience of what Gadamer calls "being addressed" and having "a genuine conversation" (Gadamer, 1960/2013, cited by Jardine in this issue).
- iii) Aubrey Hanson's contemplative narrative inquiry creates a *métissage* of storylines to reflect on both writing and First Nation culture as "resurgent presencing".

Like snow crystallization, narrative inquiry requires a willingness to improvise with one's relations, to have that genuine conversation from which meaning may grow. Citing from Moules et al. (2015), Jardine describes this meaning-making process as "a bringing forth"—a notion beautifully captured in the dynamics of snowflake formation. Relational improvisation allows each of these articles to bring forth meaning. Hiebert and Yee play with Indigenous and Western perspectives and characters in concert creating supportive and inclusive education for all students. Jardine converses with the students in the manner of jazz musicians conversing with their instruments as they play a piece. The students learn musical improvisation, as she learns that teaching itself is an improvisation. Hanson interacts with the non-human yet animate being of an urban coyote to braid personal and cultural understandings.

The second trio are all French articles that address the theme of education during the time of COVID.

- i) Dany Dias' reflective study draws from her teaching journal and the learning journals of students; she centres a relational pedagogy of care as the needed curricular balm to heal the distress so prevalent in our academic systems.
- ii) Gail Cormier and Marie-Josée Morneau offer a collaborative auto-ethnographic study describing and analyzing their efforts to valorize oral language communication during a time of enforced online learning.

- iii) Cendrine Mercier, Agnès Florin, Omar Zanna and Stéphanie Constans present the results of a quantitative study of student subjective well-being during the pandemic, using exploratory factor analysis to compare the reports of students who returned to in-class learning with those who stayed online.

These three articles all examine the effect of pandemic regulations on student success. Interestingly, while none extol the requirement of online teaching, all show successful adaptations to it, adaptations that reflect human resilience, but also the human need for caring relationships to support their well-being. A parallel to this can be found in snowflake growth. Although Libbrecht (n.d., “Snow Crystal Branching” section; 2021) would certainly not ascribe animacy or agency to snowflakes, in describing the molecular dynamics of snow crystallization, he depicts the spontaneous self-assembly of snowflake dendrites as an outcome of molecular interaction, situational adaptation and bonding. Likewise, the three French articles emerged out of a symbiotic collegiality: the relational journaling of Dias with her students; the collaborative conversing of Cormier and Morneau; and the teamwork of Mercier et al. to engage with 800 respondents to their call for research participants and to follow through with the data of the 286 students who completed the surveys.

The third set of articles were grouped together because of their common interest in a specific curricular subject, that of financial literacy.

- i) Murdoch Matheson, Christopher DeLuca and Ian Matheson report on a quantitative study of student retrospections on financial education, which found that, statistically, while students agree that financial literacy is an important topic, they judge the curricular delivery of it inadequate, leaving them with significant gaps of knowledge.
- ii) Levon Blue and Laura Pinto use a framework of critical theory to propel their thesis that an indigenous feminist financial literacy education can serve all and should be the standard curricular orientation in financial literacy.
- iii) Lara Paul and Sarah Knudson, using a framework of reconstructionism, carry out a content analysis of financial education curricula across the jurisdictions of Canada, ultimately deeming the Saskatchewan curriculum as the most comprehensive, inclusive and valuable.

It is remarkable that although these three articles address a common topic, they have contrary perspectives regarding what they consider to be most valuable in financial education and literacy. Each article reflects differences in what is seen and what is valued by the researchers. As a collection, these three articles remind us that it is important to consider that which may not hitherto have been seen or valued. For example, we tend to think of snowflakes as beautiful, lacy, stellar delights, such as the snowflake on the cover of this issue, but the snow crystal taxonomy of Libbrecht (n.d., “Guide to Snowflakes” section) reveals many other kinds of snow crystals, including slender needles, hollow columns, capped columns, diamond dust prisms and triangular crystals.

This issue ends with a trio of book reviews, which come together to present an impromptu theme on the integration of the arts into research and teaching.

- i) Joan Harrison reviews Bernard Andrew's anthology presenting diverse Canadian experiences with arts-based research.
- ii) Adrienne Kitchin reviews Lauren Berlant and Kathleen Stewart's unique hybridization of creative and academic writing, a collection of poems emerging from reflections on the theories of posthumanism and new materialisms, along with the poetic constraint of one-hundred word units.
- iii) Carolina Bergonzoni reviews Celeste Snowber's book on the poetics of dance-inquiry.

Here, the reader might take note of the radically different metaphysical beliefs espoused by the authors of these works, and how they buttress their differing epistemologies of art (their understandings regarding how art is a way of knowing). As a group, though, this trio reminds us that knowledge is not the sole purview of science, and that the integration of the arts into academic inquiries can prove quite productive. This is demonstrated, not only in Libbrecht's inclusion of visual art in the presentation and explication of his scientific work on snow crystals, but in how capaciously his insights on snow crystals extend our metaphor.

If you look at the cover image of the snowflake, you recognize it as a marvel of beauty and symmetry—you admire its uniqueness, yet, you recognize its essential features. You remember that snowflakes always have six sides—and perhaps you wonder what is going on here, that this particular snowflake actually has 12 sides! Libbrecht (n.d., "Guide to Snowflakes" section) explains that such snowflakes are rare occurrences of two six-sided snowflakes making contact and sticking together. Similarly, this issue consists of two regular issues of six items each, gathered from the past two years, and merged into one. One benefit of this grander issue is that it has allowed us to create groupings of articles.

In our review of the articles that comprise this issue, we highlighted their commonalities and differences. If you look closely at the twelve-sider you will notice many irregularities, for this is a natural snowflake, which Libbrecht photographed in Northern Ontario, not a lab-controlled formation. As such, the snowflake on the cover reflects the editors' promotion of unity in diversity. JCACS/RACÉC focuses on curriculum studies but welcomes diversity in how curriculum might be studied (e.g., *en français*). This is reflected in the fact that the dozen articles of this issue demonstrate as many research practices, which we have enumerated in our editorial summary.

We editors also welcome a diversity of research claims and ideological positions; it is not our expectation to create snowflake clones. We recognize that although we share a common human condition, and a common concern for others (human and non-human), the diversity of our lived experiences prompts a diversity of epistemological positions. We believe that meaning is enhanced by an open forum that encourages respectful listening and discussion of differing, even contrary, viewpoints.

The snowflake is a metaphor of unity in diversity, and as such, a symbol of hope. Likewise, we consider the Journal of the Canadian Association for Curriculum Studies / La revue de l'association canadienne pour l'étude du curriculum to be a vessel of hope. Hope is born from the value of care:

caring for students' well-being, and for our own well-being, and from this care striving to create the most responsive possible curriculum (Noddings, 2005).

Snowflake photographers may observe tens of thousands of crystals before they find a complete, beautiful crystal. We acknowledge that tens of thousands of actions have contributed to the creation of this crystalline issue.

To start, we remember the significant work and efforts that have preceded this collection. With this issue, we celebrate the 20th anniversary of JCACS/RACÉC, which began in 2003 under the leadership of Dennis Sumara and Rebecca Luce-Kapler. Since then, this journal has published 40 issues and over 350 pieces. All of these works contribute to the rich field of Canadian curriculum studies. JCACS/RACÉC 2023 also marks the passing of Bernard Andrews, who was a professor at the University of Ottawa and a founding member of the ARTS SIG, one of the four special interest groups of CACS, the Canadian Association for Curriculum Studies.

We thank the authors of this issue for their contributions. *Nous avons bien apprécié l'occasion de travailler à nouveau avec nos collègues francophones dans leur langue maternelle.* We are especially grateful for all those who assisted the authors in the crystallization of their ideas: the authors' families and friends who discussed their ideas and read their drafts; the peer reviewers who provided initial critical feedback; the editorial team members who contributed to the plethora of tasks involved in producing an issue of an academic journal: editorial review; article development; manuscript copyediting, proofreading and formatting; metadata translation; article layout; and digitalization. We are pleased to be able to guide and manage this lengthy and important work.

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