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Mindfully Navigating the Wind and Water: Defining the Currents of Metaphors that Interfere with Excellence in Mathematics Education

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Synopsis

We bring to the forefront of educational thought a specific attitude toward the COVID-19 crisis that harnesses the symbolism of wind and water to navigate the cultural storm interfering upon our mathematical and pedagogical craft. The purpose of our paper is to open up space for opportunities in mathematics education using integral mindfulness as the rudder to readjust our bearings. More specifically, through conceptual analyses and making explicit the currents of change, disorder, and technology, we can apply discernment to these metaphors that intersect our pedagogy to re-align efforts and attitudes toward an integrated (aperspectival) culture of mathematics education. Through shared responsibility during these tumultuous times, we can once again strive toward the pursuit of excellence in mathematics education.

Keywords: *bifurcation, COVID-19, Daoism, mathematics education, mindfulness.*

1. Introduction

Navigating the waters to reach a destination requires adaptation, and our timeless metaphoric tool — Eastern and Western — is to adjust our sails and move seamlessly with the wind. In the context of this paper, the “wind” refers to the implications of COVID-19 while the destination refers to the goal of excellence in mathematics education.

At present, we find ourselves in various states of intersecting turmoil (like the “wind”) of inner, societal, and environment conditions. Education in Canadian provinces has continued, on and off, with province-wide onsite closures (with online alternative) and targeted partial closures due to COVID-19 — leaving many with a sense of uncertainty. Lockdowns of global cities and businesses has forced parents into the roles of teachers or mediators — for better or worse. As the educational community attempts to re-organise mathematics education, the quality of online education and curriculum comes under scrutiny. The multiple closures, re-openings, and re-closures of K-12 schools and the rapid evacuation of post-secondary institutions was intended to be a temporary call to action rather than a prolonged way of life. At best, the solitude was a welcomed relief to focus on the self and its extensions (e.g., hobbies); at worst, horror stories of renewed math anxiety, cabin fever, and marred self-efficacy to teachers, parents, and students alike. For some — whether teacher, parent, and/or student — these repeated stressors are multiplied in an attempt to create meaning through the process of mathematics learning. Regardless of the position on the spectrum of stress, slogans of a new normal reverberate the socio-political landscape. The implication is that the way things were will no longer be our guiding principle moving forward through our shared crisis.

Etymologically, crisis derives from the Greek *krinein* (κρίνω) meaning to separate and decide (bifurcation); coincidentally, crisis 危机 (wēi jī) in Chinese includes 危 (danger) and 机 (chance/opportunity). The purpose of our paper is to open the space for opportunity in mathematics education using integral mindfulness (念) as the rudder to readjust our bearings through our shared turmoil. The upper character 今 jīn (now) and the lower character 心 xīn (heart, mind) compose 念 niàn, which captures the moment-to-moment awareness manifesting the presence of here-and-now oneness through embodied and enacted engagement [1].

We understand integral mindfulness in the lineage and language of Wilber [7] as a process of discernment which mindfulness can be ascribed aposteriori rather than as a generalised method of meditation alone. To discern comes from the Latin *discere* meaning “to learn;” in mathematics symbolism, our learning is an iterative (fractal) process of continual discernment to higher degrees and contexts of knowledge (an epistemic process) and deeper degrees and contexts of awareness (an ontological process). Utilising (primordial) symbolism of wind and water, we look to ascribe new meanings to the currents of change, disorder, and technology that, once made explicit, can be endowed with mindful discernment to increase the degrees of freedom for future bearings in (mathematics) education.

2. On the concept of metaphor and symbolism

Having soared the air and sailed the sea we have come to know the nature of turbulence ... that brief, tumultuous moment where sudden disorder (re: turmoil) shifts our sense of well-being and feeling of groundedness. For the heart and mind to regain stability and order (and much-welcomed relief) in our interactions with COVID-19, we strive to achieve some semblance of certainty amidst the cultural and global interference that burden our daily tasks. Etymologically from the Latin *turbulentus* (“full of commotion, restless, disturbed, boisterous, stormy”¹), turbulence can be used to aptly describe an earthly state (Di 地) of weather or human activity (Ren 人). Extending the metaphor to complete the Chinese ternary (天地人), turbulence implies an internal sense (Tian 天) of disorder with fear, pain, anxiety, and a sense of helplessness and disorientation as possible states of Being. Such states of Being do not discriminate whether one is a teacher, student, or parent.

If we extend the phenomena of wind and water as metaphors for the process of mathematics education, its orientation, and its development, then we have two metaphysical choices: to change the causal forces of the wind and water, or to change our orientation in relation with them. In the Eastern wisdom tradition we find Daoist metaphors abound with the notion of movement and flow; for those that wish to align themselves with the Dao (the Way, 道),

¹ See “Turbulent”, Origin and meaning of turbulent by *Online Etymology Dictionary*, available at <https://www.etymonline.com/word/turbulent>, last accessed on January 29, 2022.

the teaching is simple yet profound: adjust our sails to move with Nature. In other words, resistance lies within. The time of COVID-19 offers unparalleled opportunity for introspection amidst our shared turmoil. Therefore, we wish to transpose such Eastern wisdom in a Westernised context of mathematics teaching — concerning change, disorder, and technology.

3. On the concept of change

Our tendency or proclivity (bound to our propriospect, enacted structural coupling, or karma) toward certainty — and metaphors thereof — tends to be within the scientific and rational milieu of thinking *sub specie æternitatis*² [3]. In other words, we tend to hold onto the ephemeral as real and (paradoxically) unchanging. We tend, moreover, to shift toward absolutes and decontextualised thinking. Such a perspective — pervading all disciplines — arguably affects mathematics teaching and learning to a high degree as a discipline of logical operators, causality, repeatability, reproducibility, and so on. These qualifiers triangulate to the simple idea of the unchanging — and why should mathematics teaching be conceptualised differently? In recent decades, however, the mathematics of complexity has shifted mathematics toward normalcy of chaos, fractals, iterations, evolutionary processes, non-linearity, indeterminacy, and unpredictability [2]; in effect, to metaphors of change. To answer our own question, mathematics teaching can embrace metaphors qualifying change too — and what better circumstance than COVID-19 to do so?

In Ancient Greek philosophy two varying relationships governed change: the river of Heraclitus (“No one steps into the same river twice”) of the lived phenomenal world and the metaphysical “unmoved mover” of Plato. At the onset of 17th-century Modernity, these ideals collapsed to produce material knowledge — thereby certainty — in a timeless and decontextualised manner without the richly interwoven and interpreted tapestry of a complex, iterative historical process [3]. A humanist approach would “suspend judgment about matters of general theory [to] concentrate on accumulating a rich perspective ... in our actual experience” [6, page 27]; and with the advent of complexity science: what is certain is the uncertain [2].

² A Latin phrase meaning “under the aspect of eternity” with Scholastic usage that percolated into scientific thought.

The Eastern wisdom story of the Farmer's Son³ reflects our intended meaning here. Rather than succumb to decontextualised and mindless thinking, sustained mindfulness practice provides the opportunity to rise above the context of *sub specie æternitatis* to taste the wisdom of the Dao. As students, teachers, and researchers of mathematics and mathematics education, we can accept that change is inevitable, and we can rely on our own intention(s) and consciousness(es) to rise above the circumstances (of apparent disorder and turmoil) to help students create space for mathematics learning using alternative methodologies of engagement. We leave suggestions of engagement to the creative hands, heart, and head of the individual.

4. On the concept of disorder

The famous maxim *ordo ab chao* (“order from chaos”) took on renewed meaning with research on dissipative structures by chemist and Nobel Laureate Ilya Prigogine. Order and chaos become wedded as two complementary sides of the same coin, where relative chaos allows for the transcendence of emergent restructuring into creative and novel opportunities. In short, without chaos there would be no order, no novelty, and no evolution.

Industrial metaphors of ‘order’ such as uniformity, linearity, standardisations, and so on, are perceived as *disorder* in ecological education discourse. Thus, the Eurocentric rhetoric of order/disorder with respect to nature can be upgraded to chaos/order respectively: a non-trivial difference which distinguishes a monoculture from a permaculture respectively. An example we often use is pulling dandelions to ‘control’ a weedless, thereby uniform and orderly, garden which generates more dandelions, rather than perceiving the dandelions’ intrinsic interconnectedness to soil and life. By recognising a perceptual disorder as order-in-chaos, we can breathe again, to navigate and investigate alternative ways of thinking, feeling, and acting as regards our mathematics didactic strategies.

³See *Eastern Wisdom, Modern Life* by Western Zen philosopher Alan Watts; alternatively check out https://en.wikipedia.org/wiki/The_old_man_lost_his_horse.

5. On the role of technology

Through the lens of ecological educational theory, long wary of the technological encroachment,⁴ a mass migration to online education is perhaps the final limit or final straw of the ongoing process of the mechanisation of education. Such a limit can be envisioned as the passage from vocation to form in relation to teacher development [5]. From a metaphysical perspective, teachers that function to perform the mere transference of information — a positivist and industrial utopia — reveal a future where the notion of an educator becomes purely quantitative and fictitious. We say quantitative as the educator becomes an interchangeable and disqualified unit; we say fictitious to underpin the notion of technological subservience:

the machine is in a sense the opposite of the tool, and is in no way a “perfected tool” as many imagine, for the tool is in a sense a “prolongation” of the man [sic] himself, whereas the machine reduces the man to being no more than its servant; and, if it was true to say that ‘the tool engenders the craft’ it is no less true that the machine kills it. [4, page 60]

We acknowledge the impossibility of a one-sided situation. For instance, given that technology and mathematics form a mutual relationship, we hope technology becomes purposeful in terms of its potential use to augment knowledge and didactic quality. A digital environment is a staggering feat for humanity, and we can employ technology appropriately as a tool that best serves our highest educational ideals in mathematics.

6. Recap

Allowing mindfulness to penetrate the daily interactions of our phenomenal lives is the main tool to suspend judgment and bring awareness to our circumstances amidst the interference patterns of COVID-19. Metaphors of wind and water are understood as symbols which guide us through our shared turmoil. Chaos allows us to cultivate order — within — and orient our daily interactions (and stress) through our changing, technological conditions.

⁴ Already in the 1950s educational theorists bemoaned the introduction of the VHS into regular classroom activity. See Ken Weber’s *The Teacher is Key*.

We hope our quality of discernment further opens the space of didactic opportunities toward an integrated (aperspectival) and global culture of mathematics education.

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