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AN INTIMATE SCIENCE FOR TEACHING'S BEAUTIFUL ART:

A (POST)DIGITAL SPECULATION

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To my husband

who never once questioned my long and slow path here

To my family

my children and my children's children

my mother, father, brother, sister, nieces and nephews and their children

with overflowing love and deep gratitude for inspiring me to continue to dream of other futures.

Dedication

To all of you who dream, too, of beautiful futures for our children.

This work is dedicated to you.

Abstract

A conventional view of K-12 education is that it is a system for delivering the latest and most important knowledge for students to learn so they can become good or useful citizens as well as the most effective ways that it can be imparted to them by teachers. The role of education research, therefore, is to improve methods for extracting, organizing, delivering and imparting this knowledge – and educational technology is a means to expedite improvements.

If, however, education is viewed, not as a way to make students into something better through better knowledge, but as a promise for their better living in desirable futures, then an entirely different model for education research is necessary that will, in turn, expose other purposes for educational technology as helpmate in that work.

This dissertation research takes up the latter idea and speculates that the promise can only be fulfilled at the point of intimate contact between teachers and children and through teaching's art. Thinking with John Dewey's speculations on an educational science and Thomas Kuhn's analysis for scientific revolutions, this research is an invention of a new model for science, a teacher's science, that supports its art with resources, organization and connections for the making of better living in the places children learn so *they* can make desirable futures.

Because this research must develop its new model from within the existing one, it uses speculative fiction to fabulate a world where a teacher, imagining with and through the beauty of her art, is authorized to invent a model of science for it and to test it through thought experiments: education fictions that provoke the seeing/feeling of what is not yet but could be.

This invention, however, is not an argument for an *improvement* of the conventional model, but is, rather, an invitation to envision – and thereby enact – a world where dreams of renewal and revivification of education for better futures are not only possible but made

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plausible through intimate and equitable relations between teachings' art and a science of its own and with the affordances of educational technology in a (post)digital present.

Keywords: teaching as art; teachers' science; invention; fabulation; speculative inquiry; education fiction; John Dewey; k-12 education; inclusive education; anti-colonial education; pre-service education; distance education; digital education; postdigital education; educational technology

Preface

If you are reading this, you are a teacher or have been a teacher or you make the work of teaching possible. You are a revolutionary. After all, as John Caputo (2018) says, teachers are the ones who “set off quiet and unobserved revolutions that no one noticed at the time and no one can remember later” (p. 239). The future is different because of you, even if no one notices now and no one, in that future, remembers that you were the one that made it so.

Do you know Walt Whitman’s (1856) poem, “To You”? I think of you when I read it:

None has understood you, but I understand you,

None has done justice to you, you have not done justice to yourself

None but has found you imperfect, I only find no imperfection in you. (lines 13-15)

I remind you of this because this research invites you to imagine thinking and acting differently. It can *feel* like an attack on who you are now and what you believe. I want you to know that if, in any of the ensuing pages, you feel this way, it is not my intention. Your work is important. You are valued. I am filled with gratitude for you. What I have in mind with this research is to invent a model for another science that will *multiply* the effect of your work, whatever your teaching work is, and mine. This work is dedicated to you.

A preface, however, often signals that what you are about to read will not be what you expected or, even, that it will violate expectations. Consider, for example, Wordsworth’s (1802/1974) *Preface to Lyrical Ballads* to both prepare his readers for disappointment and to protect himself from a charge of indolence, because, he warns, he did not write poems as poems were expected to be written. Or Copernicus’ (1543) preface to *The Revolutions of the Heavenly Spheres*, where he admits his reluctance to publish what is “against the traditional opinion of

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astronomers, and almost against common sense” (p. 4) as a brace to readers, to the Pope, in particular, to whom his work is dedicated.

A precocious five-year-old recently asked me what my dissertation was about and when I told him I was inventing a model for a new science, a teachers’ science, his eyes widened in surprise. He did not expect that answer. Even he realized that such an invention was not the run-of-the-mill kind of research. What is more, it turns out that a new model is not created out of new evidence or better arguments, something we can at least expect in research, even if the research itself is unexpected. In his comprehensive study of the history of science, Thomas Kuhn (1996) argues a revolution in science - and a speculative model creates the possibility for it – is sparked first by a revelation. A revelation, an intimate and mysterious process, is not *an addition* to what is already known: it is seeing what already exists anew so that entirely new finding or making becomes possible.

There are expected processes for research that adds and for convincing others that what is added is better. But these processes will not work for revelations.

Although this preface is a dedication to you it is also a warning – or perhaps a plea. I have no desire to make you uncomfortable and yet there is nothing very comfortable about a revelation. Indeed, to speculate on a teachers’ science requires a shift in where we currently locate the center of education. Such a significant shift, although it makes new movement possible, feels contrary to or against what is known now, to what has long been believed, and even, perhaps, to what has been your lifelong work. I remind you, again, that the intention is to multiply that work not to overturn it.

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There is no already accepted research process for revelations. When I have deviated from what is familiar it has been neither from perversity nor indolence but because what is expected would lead away from the purpose of this research.

The best way I can think of is to bring you with me so that you become involved with me, thinking with me, becoming with me, feeling with me through my own revelations. The way may feel, not only contrary to the accepted view of how research should be done, but as though I am entirely lost. Indeed, we must often move together by feel only, in faith, that the way it is now is not the only way, that it is possible to see anew, to act anew, to bring the world you dream of, that you work for, that you toil for in your everyday work, the best part of it, the part that sets off revolutions, work that is too often hampered and unnoticed, into the light so that it can flourish.

In the end, this research offers you nothing new to take away. In you, already, is an “unfailing sufficiency” (Whitman, 1856, line 44). This, too, is the revelation.

A Reader's Guide

Included in *The Lyrical Ballads* that Wordsworth defended with his preface is Coleridge's *The Rime of the Ancient Mariner* which was roundly criticized as too obscure and difficult to read. In later revisions (he made at least 18 versions over the years) Coleridge included extensive marginal glosses to explain archaic terms and references.

My reviewers, too, more kind, no doubt, than Coleridge's critics, have suggested that my dissertation may be too difficult to read. Readers have become used to well sign-posted, more direct (and briefer!) prose in research, so that they can quickly scan the text to extract the information they seek or to effortlessly receive what is offered. They do not expect an experience they must become involved in or to navigate in the dark through dense passages, sidebars, and detours. Yet the path to the revelation necessary for a revolution in education research, at least the only path I could find, is slow, windy, and often arduous. I have every faith that, along the way, you will notice better paths or make them. I dream of such futures.

However, *you* may not yet have faith in *me*. How do you know that I am taking you somewhere *worth* all your heavy work?

To that end, in appendix 1, I include an illustrated overview of this text that includes the current model, the dispositions necessary to transition to the new model, the model itself, and the futures that the revolution might make possible. The illustration is created by the narrator with cardboard and sticky notes, and while amateurish and a sketch only, subject yet to extensive revisions, it may be helpful to you. In addition, I have taken up Coleridge's idea and revised the text to add a gloss – a brief overview of what is coming – at the start of each chapter. They are not necessary to the text but added for your ease should you wish to use them.

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However, it might also be helpful, even though this is research that invents a model for *science*, to read it as you read fiction and to take up Coleridge's (1817/1974) advice for doing so: "The reader should be carried forward, not merely by mechanical impulse of curiosity, or by a restless desire to arrive at the final solution; but by the pleasurable activity of mind excited by ... the journey itself" (p. 356).

Indeed, the ensuing pages are a *story* of a possibility rather than an argument, even when, perhaps especially when, the narrator seems to be making one.

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Chapter 1: A Place of Beginning to Lead Everywhere¹

Perhaps the World Ends Here

The world begins at a kitchen table. No matter what, we must eat to live.

The gifts of earth are brought and prepared, set on the table. So it has been since creation, and it will go on.

We chase chickens or dogs away from it. Babies teethe at the corners. They scrape their knees under it.

It is here that children are given instructions on what it means to be human. We make men at it, we make women.

At this table we gossip, recall enemies and the ghosts of lovers.

Our dreams drink coffee with us as they put their arms around our children. They laugh with us at our poor falling-down selves and as we put ourselves back together once again at the table.

This table has been a house in the rain, an umbrella in the sun.

Wars have begun and ended at this table. It is a place to hide in the shadow of terror. A place to celebrate the terrible victory.

We have given birth on this table, and have prepared our parents for burial here.

At this table we sing with joy, with sorrow. We pray of suffering and remorse. We give thanks.

Perhaps the world will end at the kitchen table, while we are laughing and crying, eating of the last sweet bite.

--Joy Harjo

Chapter 1 Gloss

In this chapter, the narrator describes her purpose - to teach beautifully and to teach others to teach beautifully - and her frustration that her efforts throughout her career have, more often than not, withered before coming to fruition or quickly faded. She feels, therefore, that she has made no lasting contribution toward the inclusive education she dreams of. She has a revelation, however. Both her early focus on implementing current research and her later focus on teaching's art have been misguided. What is needed is the invention of a teachers' science that can enable research to support rather than authorize teaching's art. However, inventing a science is easier said than done, since what she imagines, building upon ideas from John Dewey, requires an entirely different kind of research than she is expected to do. Indeed, it demands speculative audacity. She finds a work-around by using fiction to see from a new angle and by fabulating a kitchen table where anyone with a concern for teaching can gather to make possible dreams of other futures. The effort of this gathering is to speculate together for the invention of a teacher's science.

¹ The title for the chapter is taken from lines 16-17 in David Whyte's (1993) poem, "Somewhere."

Surprised into beginning again

For years and years and years I have toiled to teach beautifully and to teach others to teach beautifully. For me, beautiful teaching is an art, transforming practices that too often ossify into dull repetitions executed by rote along narrow grooves toward all too predictable ends for children into, instead, experiences that change the shape of the landscape in their lives, that allows them to see colours they did not know existed, to hear music beneath the cacophony of life and to create a world of possibilities that have not yet been imagined but have been longed for, always. This art I have been struggling to say, because it is not replicable but only created anew in each instance, *with* children, never only for children, can neither be harnessed to measurable ends nor defined through those measurements and so eludes many of our usual modes of description in research. Still, when I ask people about their experiences of beautiful teaching, they invariably have a story. Taken in themselves, their stories explain little about what is beautiful in teaching or how to achieve it, except that they evoke a choked telling or even tears, pointing to something deeply felt. How I have described the beauty of this art, and how I thought one becomes an artist of it has changed over the years and now, nearing the end of my teaching career, the picture I have is richer, more nuanced, more varied and variable. Yet, in repeatedly trying – and failing – to bring it to words that can *make a difference* for children, for teachers, for schools, to say something about this art and how it can be developed, I have come to realize that I have been missing a step. *What is needed, first, is the invention of a new science, a teachers' science not only to act as a helpmate for the complex and consequential work of teaching's art but to organize the current stock of ideas to mediate between them and what we dream of for our children.*

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No one can be more surprised than I am, since in the last several years I had become used to seeing science as the enemy of our art and had forgotten that it is entirely possible to *invent something better*, until, by lucky accident I read John Dewey² (1929b) describe the need for the development of a science *for*, rather than of, teaching's art. While Dewey admires the experimental spirit of science as a path for breaking from established classifications and interpretations of the world (Dewey, 1929a), he deprecates a worship of it that sets its findings above other human thought without which, he (2003) argues, "we shall have no great science; we shall have a lagging and halting continuation of what is thought and said elsewhere" (LW.3.11). For education to be transformative, science cannot *lead* education, he says; when it sets itself up to *know best*, and to thereby "give unquestionable authenticity and authority to a specific procedure to be carried out in the school room" (1929b, p. 15), it is antagonistic to teaching by impeding the generative and creative capacity of its art. Moreover, he argues that *social* science, under which education research falls, is made sluggish by its fear of those creative ideas so that "we do, and do over and over again, an immense amount of dead, specialized work in the region of 'facts'" (LW. 3.10), forgetting, he says, that facts are only data, fragmentary, incomplete, helpless and unhelpful *unless* rounded out by an idea. In the case of education in general, but more specifically teaching, despite extraordinary effort in the past century since Dewey made his concern known, despite seeming progress, a proliferation of sciences, and an apocalyptic deluge of data generated not only by those rapidly advancing sciences, but moment by moment by its technologies to track, record, store and, without any ideas at all, synthesize and organize the data

² Although APA 7 formatting suggests only the surname of an author is used, it does allow exceptions if the author is integral to the work. In this case, those I introduce are "companions in my thinking" (Haraway, 2016, p. 34), and as such, integral to it. It seems cold and unfriendly to refer to them, at least when they are first introduced, by last name only.

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to present us with answers to every question; it feels as if education continues to be stuck in a groove of do-overs and our classroom practices, following, falling into repetition.

My purpose is not to prove this point, however, but only to set my efforts within a sense of this lack of progress that the very profusion of research on how to improve education expresses. As a single example from researchers who have spent decades in change efforts Michael Fullan and Mark Edwards (2022), drawing on a plethora of other research as well as their own, argue, “When it comes to fundamentals, schooling hasn’t changed much in the past 200 years. The basic ‘grammar of schooling’...has remained essentially the same” (p.3), which includes teaching as transmission, batching children by age, egg-crate classrooms led by individual teachers, uniform scheduling, testing by grade/subject, separation of school from community and “ignoring or miscasting of the equity problem” (p. 4). What’s more, they note that “various surveys and studies show that a greater and greater percentage of students either tune out or mechanically do their work to get the grades” (p. 4). This is despite the extraordinary advances through cognitive and neurosciences in the understanding of motivation and engagement, and, more explosively, new technology to support, enhance, extend, and facilitate what we now know about learning. Yet Neil Selwyn (2016), in researching the impact of technology, echoes Dewey’s concern about do-overs: “A sense emerges of education being improved and upgraded while remaining essentially the same in terms of its institutions, organization and general way of doing things” (p. 6).

So it is to make a difference, one *felt* by teachers and children in public school classrooms, that I want to take up Dewey’s idea, 100 years after he proposed it, to invent a new **model** of science for teachings’ art, one authorized *by* practice rather than an authority *over* it or *of* it. In order to do so, therefore, I must accept, too, his plea “for the casting off of that

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intellectual timidity which hampers the wings of imagination, a plea for speculative audacity, for more faith in ideas, sloughing off a cowardly reliance upon those partial ideas to which we are wont to give the name of facts” (LW. 3.11).

Indeed, I have come to realize, too, to my further surprise, that I *have* been timid all these years, even when I thought I was bold, going along, even when I thought I was striking off in a new direction, taking up, for example, the latest methods and technologies, and seeking, always, more and more knowledge to improve teaching, to improve learning, to improve systems, even going so far as to commit to doctoral research in distance education as the leading edge of the future. Yet although the recent rapid developments in and deployments of digital technologies in both virtual learning environments and traditional classrooms have confirmed the importance of distance education, it also makes the term increasingly obsolete. As Petar Jandrić et al. (2018) point out, “contemporary student practices with technology are complex entanglements between physical and digital technologies, spaces, activities, and time” (p. 896). Recently, a very small child, not yet in school, asked me about something, some fact he wanted to know, and when I said I did not know the answer, said, “But don’t you have your phone?” Many of us live, now, in a *postdigital* world where tidy categories give way in the face of complex entanglements: wherever we are, we are also, instantly, in multiple worlds.

Yet I have come to realize, that the possibilities of digital experiences, too, are only as inventive as our *idea* of education. Without renewal all its promise lay in wait and distance education, however named or implemented, and whatever the technical advances underpinning it, even as the digital changes the worlds we live in, can only offers new ways to do over what has long been done. Certainly, it has been waiting these last 25 years, since Seymour Papert prophesized that Dewey’s ideas for experiential education could finally be realized given the

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capacity of computers as “an instrument of revolutionary change that will liberate [teachers] from the anti-learning practices of the one size-fits-all curriculum” (Papert & Roszak, 1997, p. 7). He envisioned a future (the one you and I now inhabit) where “teaching the fifth-grade math curriculum will seem as quaintly old-fashioned as using stage coaches to get across the continent” (Papert & Roszak, 1997, p. 2) – unless, he added, many computers are placed in otherwise unchanged schools to do what has always been done. In the province of British Columbia (2020), despite a redesigned curriculum modernized for “a technology-rich world, where communication is instant and information is immediately accessible” (para. 1) and “the way we interact with each other personally, socially, and at work has changed forever” (para.1), the fifth-grade math curriculum is still firmly in place. The “grammar of schooling” that Papert thought was already moribund then remains now not only seemingly unfazed by the digital technologies that I have so long advocated for, that I, too, believed would open new possibilities for wider and more beautiful experiences for children, but has been, rather, strengthened, even augmented, by them.

More painfully, it has slowly come upon me that my efforts have not improved the problems I have sought to solve but *contributed* to them, that far from advancing an idea of the art of teaching, because I advocated for it under the authority of science, explaining, proving, drawing from and supporting my conclusions with specialized work that provided “facts” as evidence to verify and validate, I shored up what I sought to overturn. Moreover, the very effort to overturn kept me churning in the same rather than finding what might make a *difference*. Indeed, quite otherwise, since ongoing changes that change nothing serve only to calcify opposition to change and exhaust its champions. Michel Serres (1995), whose philosophy explores the intersections of art and science, notes, “An idea opposed to another idea is always

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the same idea, albeit affected by the negative sign. The more you oppose one another, the more you remain in the same framework of thought” (p. 81). Indeed, that framework is one of violence, a warring of ideas that seeks to eradicate or overcome the enemy, in “competition for control and possession of a fixed environment” (Dewey, 2003, LW.2.112) rather than, as is the case of invention, *creating* an environment. To invent, Serres (1995) argues, is “the production of newness” (p. 126) and, therefore, demands not more knowledge or better facts with which to best one’s opponent, but “a learned unknowing, the suspension of judgments...questioning, doubt, incertitude, reconstruction starting from zero” (p. 90).

Conventional education research, however, requires that a researcher begin with almost everything in place: a manageable, practicable, clear, limited, bounded “answerable” question, an exhaustive review of what is already known about the topic to further focus and authorize the research question and from which to draw evidence, an accepted methodology from which a strategy is chosen for gathering further data, and a plan for analysis so the question can be answered in a manner that can be verified, validated, reliably reported and replicated (Cohen, et al., 2011). In other words, as Elizabeth St. Pierre (2016) argues, echoing Dewey’s concern, those trained in methodologies (and this is still common practice in education doctoral programs) can “‘do’ research by following a recipe without having to ‘think’ much at all” (p. 9); they do, and do over dead work into an always new world. Indeed, such research, much of it already automated, may well soon be completed almost entirely by machine in view of both the exponential growth of information and the growing capacity of generative AI, selecting for us, from vast stores of given data (or as Dewey [1903] phrases it, “taken” data, extracted from its rich and complex

environment to provide evidence for a purpose elsewhere [p. 61]) and analyzing it according to pre-set methods to deliver an answer.³

For *renewal*, therefore, research *itself* must be reimagined; hence, here, the invention of a new model for science.

Yet how do I even begin such research when research is authorized by what I must unknow in order to begin at all? How do I start from nothing when I am expected to start with everything? And how do I think otherwise without falling into the trap of arguing against?

Giving authorization the slip

My difficulties are not new, of course; they are felt by all those who wish to speak against what is authorized. Virginia Woolf felt the difficulty when she was invited to talk about women and fiction. Indeed, I might not have been struck at all by Dewey's notion of a teachers' science if I had not also been rereading Woolf's (1928) *A Room of One's Own*. Woolf, writing at a time when some women in some places had newly acquired the right to vote and were only just beginning to be allowed to attend some universities, argues that what is first necessary for women to write is a room of her own. She says that although she has no hope of offering "a nugget of pure truth" (p. 5) about the true nature of women and the true nature of fiction (the data of the time, of course, would provide a surfeit of evidence that women could not and should not write at all), she could, she says, deliver an opinion on the room and money. Neither are important in and of themselves, but for the freedom they afford women to write *as* women rather than deferring to the men who have authority over them (who are authorized, too, to *explain*

³ Recent advances in generative AI include the rapidly evolving development of reasoning models. In other words, it not only searches for information but "thinks" about it to develop arguments. Researcher Ethan Mollick (2025) from Wharton's School of Business tested Open AI's Deep Research with a highly technical and controversial issue in his field. The result, he said, was a paper that would have been acceptable from a beginning PhD student.

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women with “no apparent qualifications save that they are not women” [p. 29]); or by writing in the shreds of time available to them as they busied themselves with what they are authorized to busy themselves: the pots, laundry, runny noses. In other words, a room of their own would allow women to *make* the facts of women’s writing. So, too, I realize at last (after many fruitless attempts), I cannot hope to deliver any “nuggets of truth” about teachings’ art which is defined by its variousness and by what it *becomes*, but I can propose the invention of a model of science for it, a science of our own for teachers, that might allow us to develop our art rather than deferring to the authority of scientific experts (that authority, it sometimes seems, derived from the fact that they themselves are not teachers) or attempted in our own in time snatched at between wiping desks, ordering books, cutting out butterflies, processing pizza orders, organizing thirty small children to go outdoors for recess, calling parents and busying ourselves in accordance with what is authorized.⁴

To slip around the problems of authorization and argument, Woolf (1928) writes that although she *is* going to develop the train of thought that led her to think about a room of one’s own, she is going to do so by telling a story, because, she writes:

When a subject is highly controversial...one cannot hope to tell the truth. One can only show how one came to hold whatever opinion one does hold. One can only give one’s audience the chance of drawing their own conclusions as they observe the limitations, the prejudices, the idiosyncrasies of the speaker. Fiction here is likely to contain more truth than fact. (p. 6)

⁴ This narrative of those who are authorized to know better about those they aren’t and about what they have never done is played out in many contexts. Tuck and Yang (2014) note that “research is a dirty word among many Native communities...and other communities of overstudied Others” (p. 223). They argue for “a refusal to do research, or a refusal within research” (p. 223) as “attempts to place limits on conquest and the colonization of knowledge by marking what is off limits, what is not up for grabs or discussion, what is sacred, and what can’t be known” (p. 225).

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That is, when “fact” is defined by what is authorized, truth outside its agreed-to boundaries is necessarily “fiction,” speculative only since it cannot be proved by proven facts. Sex, as Woolf notes, is always controversial and so is education, which is by no means separate from the controversy of sex, since, at least the teaching of children, is still largely practiced by women⁵; indeed, education is long suffused with the patriarchal and, as we are coming now to be more and more aware, the companion idea of colonialism, as is evidenced by those previously excluded from education. As long as we are content to do and do over, those ideas are perpetuated *through* education and newness cannot take root. Indeed, Woolf’s contention that “one cannot hope to tell the truth” about what is controversial, if by truth one means “the facts,” is echoed by sociologist Ruha Benjamin (2016), speaking against colonialism’s ongoing racial violence and the very idea that “empirical evidence of systematic wrongdoing” (p. 2) is either necessary or helpful: “The facts, alone, will not save us. Social change requires novel fictions that reimagine and rework all that is taken for granted about the current structure of society. Such narratives are not meant to convince others of what is, but to expand our own visions of what is possible” (p. 1).

Education research cannot be a source of renewal unless it is, itself, renewed with new ideas, that is, with the imagined. The *privileging* of scientific thinking (not scientific thinking itself), along with its methods and discourse in research, however, *prevents* that creative renewal. Not only is such a limit restrictive, confining research to correspondence with the already thought (Dewey, LW. 3.11), but it impedes *difference*. As Virginia Woolf (1928) notes, “It

⁵ In BC only 25% of teachers are male while 40% of school administrators are male and 65% of superintendents. See [doctoral research](#) from BC Superintendent Chris Kennedy (2021). The [BC Teachers Federation](#) notes that the percentage of female teachers in K-12 is closer to 80%, that number even higher in primary, and, based on projections from teacher education programs, that figure will soon be as high as 90% (Murray, 2019).

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would be a thousand pities if women wrote like men, or lived like men, or looked like men....

Ought not education to bring out and fortify the differences rather than the similarities?" (p. 87).

While universities, where researchers are trained, open their doors wide not only to women but to anyone at all who can meet their standards, it is the standards themselves that are of concern, not what difference might become possible and so change is thwarted (Stengers & Desprit, 2014). Meanwhile, in the classrooms where our children are, despite intermittent flourishing in small niches, as long as thinking otherwise in education is so stalled, doing otherwise is stalled, too, and those fighting for change sound shrill notes that Woolf describes in early women writers:

One has only to skim those old forgotten novels and listen to the tone of voice in which they are written to divine that the writer was meeting criticism; she was saying this by way of aggression, meeting criticism. She was admitting that she was "only a woman," or protesting that she was "as good as a man." She met that criticism as her temperament dictated with docility and diffidence, or with anger and emphasis. It does not matter which it was; *she was thinking of something other than the thing itself*" [emphasis added]. (pp. 74-75)

I hear, here, my own shrillness rising. I am making an argument. I am trying to convince. It makes no *difference* to the children.

I long for what I imagine for children with the sharp bitterness of homesickness as if what is not yet were somewhere tangible, but I remain locked in what feels like a senseless battle on foreign soil, far from them, mired in debates over methods, piling up evidence, gathering facts, defending my position, seeking those who will authorize it. Yet I know, as poet Seamus Heaney (1995) points out, that "debate doesn't really change things. It gets you bogged in deeper" (para.

85). Each side gathers up its data as “proof” that denies, minimizes, or overturns the evidence of the other side. Our success – and success is whatever is determined by our measures – is then measured by our data. We triumphantly conclude that 89% of students are successful with our method; the 11% become insignificant (they were insignificant as soon as they became data, of course). Or *if* we attend to them, if someone says, we want “success for all” and the proof is in the numbers, the fix is on fixing the numbers. Thus in BC, the “improvement” of Indigenous graduation rates, when the surface is scratched, shows the improvement is produced by concurrent higher rates of Indigenous students in courses that will allow students to graduate but are not recognized for advancement to post-secondary education or they “graduate” with “school completion,” a designation usually reserved for students with significant and complex learning disabilities and not even accepted by employers for entering the workforce if grade 12 certification is an expectation (Bellringer, 2019). But this is fighting data with data. Without *an idea* that brings us together, that *moves* us, all data becomes a cudgel for the war we are mired in. Neither side is unstuck by the data of another, merely inspired to gather more of its own. It makes no difference for the *children*.

Heaney (1997) says, however, that, “If you can address or reopen the subject with something new, something from a different angle, then there is some hope” (para. 87). He credits poetry with this capacity to shift our gaze up and out of the battle, so that, in the pause thus created, we can see other possibilities and so move out of the bog. Yet as long as the poetic (human thought not bound by “reality” as defined by authorized “facts”) is set *below* science’s finding, it is powerless, and as long as I am expected to use the methods of science for the *invention* of science, folding anything imaginative under and into those methods to explain,

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justify, prove and only as authorized by those who “know better” – in other words, by the already known – nothing moves.

In my timidity and anger, my frustration and discouragement, the din of criticism ringing in my ears, the well-meant advice to just “go along” with the way things are, and more debilitating, the fear that I do not know enough, after all, that I am “only” a teacher, I have forgotten *the thing itself* and my greater fear described by W. E. B. Du Bois (1920) who stood against authorized racism in a time when many schools in North America still formally sorted children by colour. He writes,

Why not always yield – always take what's offered, - always bow to force, whether of cannon or dislike? Then the great fear surges in your soul, the real fear – the fear beside which other fears are vain imaginings; the fear lest right there and then you are losing your own soul; that you are losing your own soul and the soul of a people; that millions of unborn children, black and gold and mauve, are being there and then despoiled by you because you are a coward and dare not fight! (p. 224)

The thing I want to think about is how we can teach our children – all those today and yet unborn – beautifully. I want to do so without yielding to the way things are, nor with the passive cowardice of complaint and recriminations, nor yet with the anger and gathered armaments of explanation and evidence. The fix, after all, is in with any fight. It is not that I dare not fight, but I realize now, that I must look up and away from battles to see anew.

In this research, I want to step down from the podium from which I explain how I know I know better, confidently expounding my points, reinforced by carefully extracted facts and authority from acclaimed experts, rebutting possible counter-argument that anyone might level

against me, toward a persuasive conclusion, one that adds to existing scholarship, that provides a nugget of new truth for those in need of it, along with a defence and description of its value.

Starting from zero (Serres, 1995), I have nothing to say there.

Still, I am not, therefore, made silent. We have long gathered to talk together in different ways to think, wonder, dream.

Adjourning to the kitchen table

I imagine, here, a kitchen table, where, as Joy Harjo (1994) writes, “The world begins” (line 1). Here, she says, “the gifts of earth are brought and prepared” (line 2), the children “are given instructions on what it means to be human” (line 4) and “we gossip, recall enemies and the ghosts of lovers” (line 5). Here, too, “Our dreams drink coffee with us as they put their arms around our children” (line 6). It is a place that shelters us, rejuvenates us, restores us, a space to grieve, suffer, err, sing, and celebrate together.

The table and our sitting together at it is a fiction, as Virginia Woolf recommended for controversial topics, or more precisely, a fabulation, which is fiction that is concerned with *ideas* and in its pursuit of them very often violates our expectations of what is done or not done in fiction by inventing freely and experimenting with subject, form, style, sequence, fusing the everyday, for example, with the mythical, the serious with the trivial (Scholes, 1967).

Fabulations have been disrupting conventional research by violating expectations increasingly in the last decade through posthuman, post qualitative, artistic, and speculative research (Dunne & Raby, 2013; Lather, 2006; Lury & Wakefield, 2012; Haraway, 2016; Michael, 2021; Ross, 2023; Savransky, 2017).⁶ Although thinking with these theories and theorists, and more especially with

⁶ There are, of course, scores of others who could be added to this short list of fabulators and, indeed, throughout this text at every point. Yet as Michel Serres (1995) notes, there is a danger in making such a gathering up of everything that has already been said a concern of research: “If one had to recopy

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speculative inquiry to effect the necessary “speculative audacity” (Dewey, 2003, LW. 3.11) and out from it into the capacious space opened by Donna Haraway (2016) – “SF: science fiction, speculative fabulation, string figures, speculative feminism, so far” (p. 2) – I want, above all, to keep in mind the words of William James (1907/1981):

Our acts, our turning places, where we seem to ourselves to make ourselves and grow, are the parts of the world to which we are closest, the parts of which our knowledge is the most intimate and complete. Why ... may they not be the actual turning places and growing places which they seem to be of the world – why not the workshop of being, where they catch fact in the making, so that nowhere may the world go in any other kind of way than this? (p. 129)

I want to *make* here, not repeat; I want to *turn toward* what concerns me dearly, the children and how to teach them beautifully, not get bogged down in explanations from elsewhere. I might study posthumanism or continental philosophy or speculative pragmatism or Dewey or William James or anyone else or any other theory for yet another decade and still not know enough to *make* anything with them that matters for children. Although I will pick up the threads of scholarship, and address issues of method, ethics, validity and verification, I want to weave *with* them *out* of the concerns of the classroom rather than, as is too often the case, peer into the classroom through their various lenses. As Haraway (2016) says, “It matters what matters we use to think other matters with; it matters what stories we tell to tell other stories with” (p. 12). I want to tell a story to tell the story of possibility for fabulation in research, not by

everything one had read, books would become alarmingly obese. Even more important, this repetition would make them not very informative” (p. 80). Indeed, it risks plunging us once again into potential opposition to and authorization from these many others and any newness is lost in the noise of the ensuing battles. The great challenge of invention, Serres says, “is getting rid of everything one knows” (p. 67): the writer – and, too, the reader, he says – must arrive “newborn before the text” (p. 81).

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gathering authority from elsewhere, but rather from the classroom, where my own knowledge is most intimate and complete – and where the children are, who are the concern of this research.

When I taught high school English, I would read aloud Gabriel García Márquez's (1970) fabulatory short story, "The Handsomest Drowned Man in the World." My students always reacted strongly to the story. Ruthlessly set in the groove of hundreds of short stories read, questions answered, the elements of story, protagonist, antagonist, rising action, climax, denouement, they were shocked by the beginning of the story, where the children of the village played all day with a corpse, and were vociferous in their belief that drowned men, ravaged by tides and decomposition, cannot be handsome, never mind so handsome that "there was no room for him in their imagination" (p. 209). Yet as the students followed the story, protesting, still, they were willing to suspend both disbelief and judgment long enough to hear of the villagers and their experiences with the drowned man whom they named Estaban and how they were transformed by him, so that even after the villagers returned the drowned man to sea, they knew "that everything would be different from then on" (p. 211). Indeed, the villagers knew that in their grey, wind-ravaged and desert-like village, because of Estaban, they would dig for springs so they could plant flowers, and "in future years at dawn the passengers on great liners would awaken, suffocated by the smell of gardens on the high seas" (p. 211) and the captain would explain that there, "where the wind is so peaceful now that it's gone to sleep beneath the beds, over there, where the sun's so bright that the sunflowers don't know which way to turn, yes, over there, that's Estaban's village" (p. 211). In other words, the villagers would live *into* the idea of Estaban.

My students, as they made room for thinking otherwise, began to breathe in new possibilities for their own writing, their reading, and their lives that had been entirely absent

before, of the possibility that *an idea* can move us to act to create *something better*. That futures *are* created.

Everything was different from then on.

I offer nothing so fabulous as a handsome drowned man, except, perhaps, the premise of my research, that a teacher might, indeed, invent a model for a new science. Yet it does violate expectations of what research is or can be or who might define it. A fabulatory mode creates *and* resists, but the resistance is neither with cudgel nor complaint: it is in the gesture of otherwise (Stengers and Desprits, 2014), turning away from the battle and toward the turning places of action. However, fabulations require a “leave-taking from reality” (Butler, 2021, p. 10) that accepts what violates expectations, that is, what has long been taken for granted, in this case, the way research is “done.” The more firmly and deeply-held the expectations, the more thoroughly one has been trained in them, the more difficult it is to take leave (St. Pierre, 2016). Yet it is essential for thinking with ideas rather than within the groove of convention, in this case, of what constitutes research and what science is – or could become. As Butler notes in an interview, “Sometimes ‘reality’ is used to debunk as childish or unknowledgeable points of view that actually are holding out a more radical possibility of equality or freedom or democracy or justice, which means stepping out of a settled understanding” (in Gessen, 2020, para.25).

To make this “leave-taking” possible, therefore, I take the great risk of inviting you to the table. Social science research has for some time given up the pretence that the researcher is immaterial and therefore, can – and ought to – remain invisible (Connelly & Clandinin, 1990; Eisner, 1981; Ellis, Adams & Bochner, 2011); even in the natural sciences where the human-to-human interaction that complicates everything is removed, the most anonymous data extracted and measured at the greatest distance imaginable is touched by the researcher, and thereby

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changes what happens elsewhere (Kauffman, 2016). Yet it is still unacceptable to break the “fourth wall” to speak to and of the reader without whom nothing is *done* – and never has been. I do not mean, of course, the “you” that you are anymore than I mean the “I” that I am (or think I am). You and I are fabulated, here. As Virginia Woolf (1928) describes it, “‘I’ is only a convenient term for somebody who has no real being,” (p. 6). So, too, “you” - and the “we” of us who sit together, too, is fabulated, is fabulous, but as we sit together, it is possible that the “we” *becomes true*⁷ and in that becoming we might *make* truth in the actual world.

I hope you will draw up a chair.

In the manner of the kitchen table, whoever joins us here joins as friends who dream of something better for the children who are our concern, not as authorities who know better or as defenders of the already thought. Thus, there is no need for a review of the already-known to situate ourselves within it or to find a gap to fill in someone *else's* research or to explain, interpret, validate or differentiate. Indeed, “one of the worst academic habits is the remark that somebody else has already produced something similar to what you are proposing,” Stengers notes, adding, “Well, one would hope so!” (Savransky & Stengers, 2018). What is more important, she says, is to think *with* rather than trying to find ways to think against something and, in noticing similar ideas, to attend to what might be trying to be heard. Indeed, although I want to take up the idea of a teachers’ science from Dewey, it is not to think *about* his idea – providing arguments for and against – but to think *with* it to make something better for the children he cannot have known in a world he could not possibly imagine. Nor do I think it is

⁷ An increasing use of the fourth person perspective, the collective subjective, a “we” that is composed of multiple narrators but acts as a single unit, is emerging from an increasing sense of blurred boundaries in postdigital worlds and a growing awareness of interconnectedness and interdependency; it is also one of the consequences (or affordances) of the digital, for example, in Virtual Reality where the “reader” exists in and makes the story (Koh, 2020).

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therefore necessary to think as a Deweyan or as a pragmatist, which in turn demands thinking against other schools of thought and defending why this rather than that theory or method is better, thus becoming mired in the already thought rather than what thinking might *make*. It is for this reason that there is no need to dispute newness; what is created is always new. Nor does the most current research take precedence at table, as though wherever the researcher is in time is the pinnacle of achievement, as if we who live now “know better,” dismissing our ancestors out of hand (Serres, 1995): our ancestors always sit with us at the kitchen table to make with us.

Wherever we are, whenever we are, whoever we are, we are the ones who gather and have always gathered around the table to talk about our dreams for our children.

At the kitchen table, we who listen do not dictate how the story is told. How can we? A story belongs to the teller although, once told, it is ours too, to make something with. Even if we have heard the story before, it is always new, renewed at each telling, *made* new, depending on who is at table, whether tides are high or low, the sun rising or setting, whether we sit together in sorrow or laughter or just quietly, eating and getting on, but always gathering, telling, listening so we may “put our poor falling-down selves...back together once again at the table” (Harjo, 1994, line 5). Such putting together is not possible on the first telling. Whenever something happens, accidents, inconveniences, arguments, even catastrophes, my mother always says, well, that will make a good story one day. It is only recently that I have come to understand that a story is good when it is no longer raw, and we are not so wounded, not when we are in the battle but when we look up from it. I listened to my dearest friend recently, telling a story of her shame and humiliation and as we laughed and laughed, I saw her put herself together. I know that to tell the story, she had to change it; exactitude is not the reason for telling and the points of divergence are where it is possible to remember what has been forgotten. The listeners know this

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and do not interrupt to claim they have heard the story before (they know that no matter how many times they have heard the story they are hearing it for the first time; *it is made in the making*) or to ask for proof of points or corroboration from more reliable witnesses. After all, at the table, there is no fear that the teller is lying to us or trying to pass off something, who knows what but something we need to guard against. At the table, we have suspended our disbelief since the “facts” are not the point of the telling and the truth is what is made there. The trust goes both ways. The teller, although the telling is difficult, knows that they can bare their heart and it will not be broken by scorn or rejection or ridicule; if there is laughter (and there is always laughter), it heals. Indeed, to recover ourselves from the hold of long-held ideas, one must heal; they cannot simply be overcome (Debraise and Stengers, 2022).

The language of the kitchen table is not what Ursula Le Guin (1986) calls the “father tongue,” which, as she says, when it “announces itself as the voice of reason, it is playing God, and should be spanked and stood in the corner” (para. 5). This is the voice of those who “know better,” who speak with confidence from the podium. Such inequity is not allowed at the table where everyone, even little children, have their say. Why should they not? Which one of us knows so much that we cannot listen? Who among us knows so little that we cannot contribute? Yet the father tongue, Le Guin argues, *maintains* the imbalance of domination:

Everywhere now everybody speaks the same language in laboratories and government buildings and head-quarters and offices of business, and those who don't know it or won't speak it are silent, or silenced, or unheard. The father tongue is spoken from above. It goes one way. No answer is expected, or heard. (para. 5)

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There is no need to address the reader when one writes in the father tongue.⁸

For those of us from families and communities that have never been to university, the father tongue is unfamiliar or learned only as another language. When I first returned home for a holiday break from university, the first in my family to attend, I bounced into the room and talked enthusiastically about the things I had learned and everyone stared with just the same sort of horror that my sister did when, one time, after an extended stay in the Netherlands, I spoke to her in Dutch. I do not mean that what I learned at the university could not have been understood by my family; I needed, first to translate it to what Le Guin calls the mother tongue:

Using the father tongue, I can speak of the mother tongue only, inevitably, to distance it – to exclude it. It is the other, inferior. It is primitive: inaccurate, unclear, coarse, limited, trivial, banal...it's vulgar, the vulgar tongue, common, common speech, colloquial, low, ordinary, plebeian, like the work ordinary people do, the lives common people live. The mother tongue, spoken or written, expects an answer. It is conversation, a word the root of which means "turning together." The mother tongue is language not as mere communication but as relation, relationship. It connects. It goes two ways, many ways, an exchange, a network. Its power is not in dividing but in binding, not in distancing but in uniting. It is written but not by scribes and secretaries for posterity: it flies from the mouth on the breath that is our life and is gone, like the outbreath, utterly gone and yet returning, repeated, the breath the same again always, everywhere, and we all know it by heart. (para.10)

⁸ It is difficult to have a conversation - or even to tell a story - within the conventions of academic writing which is made for the father tongue. Footnotes are one way to interrupt the seamlessness of seeming argument and the linearity of paragraph after paragraph with interruptions that interject digressions, hesitations, sidenotes, and answers to questions from an imagined interlocutor whose raised eyebrow demands proof I don't have for assertions I try not to make.

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Sitting here at the kitchen table, I need to tell again my story of schools, one of frustration and sorrow and remorse, to find my way *out* of the story. I yearn to put things together enough to remember again why we gather our children together in schools; I want to dream a dream that puts its arms around them and a way to make it come true.

Questions of Method and Positionality

The invention of a new science, Thomas Kuhn (1996) observes, almost always begins with someone new to the field, since, he says, as did Dewey and St. Pierre, “scientific training is not well designed to produce [someone] who will easily discover a fresh approach” (p. 166). Indeed, he, too, argues that education is effective for equipping the scientists to become an efficient instrument “for puzzle-solving within the tradition that the textbooks define” (p. 166) but not for imagining otherwise.

When someone is new to something, however, before becoming familiar with (or educated into) the way of things, they are often surprised by what no one else questions. If they blurt out their question anyway, eyebrows are raised and the answer is some variation of the one my mother so often gave us as children, “Because I said so.”

“Why do all the students have to read the same book?” I asked when I first started teaching English at high school and was handed the texts for that grade.

“Because it is required,” the department head told me as though that were answer enough. Yet Eduardo Galleano’s (1992) short story “Bureacracy 3” illustrates one of the many dangers of acquiescence in authorized orders:

At a barracks in Seville, in the middle of the courtyard was a small bench. Next to the bench, a soldier stood guard. No one knew why the bench had to be guarded. It was guarded around the clock - every day, every night, and from one generation of officers to

the next, the order was passed on and the soldiers obeyed it. No one expressed any doubts or ever asked why. If that's how it was done, there had to be a reason.

And so it continued until someone, some general or colonel, wanted to look at the original order. He had to rummage all the files. After a good bit of poking around, he found the answer. Thirty-one years, two months and four days ago, an officer had ordered a guard to be stationed beside the small bench, which had just been painted, so that no one would think of sitting on wet paint. (p. 64)

When I started my doctoral work, I questioned the requirement for, and emphasis on, method and, following from it, researcher positionality (which impacts the validity of the method chosen). As with the case for high school textbooks and even, no doubt, for my mother's brusque response, there are, of course, many reasons. Yet the requirement, however reasoned, seemed anti-educational to me, at least, in the sense that I understood education – and dream, here, for it to become – which is to grow beyond familiar boundaries of what is already known and who we already are, so that, from that growing, we develop a richer, broader and more expansive awareness of options, responsibilities and possibilities and are, thereby, able to decide – or to contribute to decisions – about our directions rather than following directions.

For education so understood, not as a “narrow and rigid” (Kuhn, 1996, p. 166) path toward becoming an efficient instrument for existing traditions, but rather a movement of expansiveness and agency so that students, as Dewey (2003) puts it, become “creators of the future” (Dewey, 2003, LW.17.463), order *cannot* be imposed. What is more, he adds, teachers, too, to make such growing possible, cannot be “shackled by too many rules and prescriptions and too much desire for uniformity of method and subject matter” (LW.15.188). Indeed, an educational science, he says (1929b), awaits two things – the maturation of other sciences that

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would be its source and the “emancipation and elevation” (Dewey, 2003, LW.3.256) of teachers who would lead it. To invent a teacher’s science, therefore, I cannot remain a foot soldier under the order of methods from elsewhere.

Yet to even name this work research, I must define myself as a researcher (as positioned within a stated set of positions), it seems, not as a teacher, or if as a teacher, only in attenuated ways, to research my own practice, in other words, toward self-improvement. If I wish to research outside my “insider” knowledge, however, I must define myself by research; I must research as researcher. Virginia Woolf (1928) noted a similar problem for women writers, in that they were expected to write as men. Yet, she says, “the weight, the pace, the stride of a man's mind are too unlike her own for her to lift anything substantial from him successfully” (p. 76). Certainly, I have tried on the cadence of any number of research methods, and none fit. I am no longer a teacher in them. I might do as I am told (just to get things done) and take up a method anyway but find a way to be a teacher in a hidden way, as many women writers did, with a pseudonym, Currer Bell instead of Charlotte Bronte. I might more readily hide myself, for example, inside post qualitative inquiry which is yet in flux; it is, as Woolf (1928) notes of the novel, not yet hardened and set but “young enough to be soft in [one’s] hands” (p. 77). However, unlike the novel, it is not so pliable; to take its name is to “colonize it” (Carlson et al., 2021, p.152) for my own purposes. Despite its resistance to a fixed shape, post qualitative inquiry is “scholarship that questions the humanist project, the proceduralism of social science, and the centrality of Western knowledge and truth” (Carlson, et al, 2021, p.). Although the work it is doing both supports the invention of this research and offers possible processes, its intention is not mine. Moreover, in so disguising myself, I devalue rather than elevate teaching and thus work against the purpose of this research. A teachers’ science cannot be invented by a post

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qualitative researcher, not even if created with “participation” from “real” teachers, through “engagement” in workshops or conversations or surveys designed by researchers (who, by definition, it seems, are not “only” teachers). It must be invented by teachers whose ongoing inventions in practice with it will make the futures we dream of.

Of importance, the very openness of the word teacher – the one who teaches – invites the multiplicities that the invention requires and identifies – gives identity to – what constitutes the work of this research (Stengers, 2019a). To name by claiming other labels requires engaging in boundary battles outside the practice of teaching itself. Indeed, the very project of conventional research might be understood as laying claim, or gaining victory, of winning the battle for best: we who are (whatever we name ourselves to be) are on the winning or, at least, right side against whatever we are battling. Kakali Bhattacharya (2021) speaks of the “corrosive nature of oppositionality incentivized in academia” (p. 181). The addition of more methods and positions in conventional research, therefore, are not additive in an educational way, that is, to multiply possibilities but rather to eliminate others accounts or at least to supersede them (Latour, 2016). Nor is the intention, with those additions, to overspill boundaries but rather to confine them within.

Indeed, to become a researcher, one is required to take up even further labels. Bhattacharya’s attempts to remain unlabelled are informed not only by her desire not to be “placed” (even within the more generous placing of post qualitative research) but also by her questioning of positionality which inevitably erases what cannot be placed. As Mark Fathi Massoud (2022) notes, positionality is “the phenomenon of opening up one’s self-identifications – rather than only one’s scholarly ideas – to criticism” (p. 565). Positionality establishes trustworthiness, he says, in an “academic culture...built upon scepticism and critique” (p. 583).

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It is meant, education researcher Andrew Holmes (2020) explains, to identify the researcher's "world view" (2020, p. 1) – their ontological and epistemological assumptions, their philosophical, personal, political beliefs and other positions (age, social class, gender) – and how these positions influence what they notice and how they interpret what they see. For new researchers, he says, this can be "a complex, difficult, and sometimes extremely time-consuming process" (p. 5). Yet a strong sense of positionality, once found, he argues, allows for a "reduction of bias and partisanship" (p. 4). Thus positioned, the researcher can either become as neutral as possible by guarding against these influences or alternatively thus declare the side they will take in the research (Mendez, 2023). Adding positionality is a way to fit more methods *within* conventional research so that despite their proliferation that are, to a large degree, a result of newly acknowledged positions (feminist studies, for example), "The reader should then be able to make a better-informed judgment as to the researcher's influence on the research process and how 'truthful' they feel the research data is" (p. 3). Even though, Holmes says, "it is not a guarantee of more honest, truthful, or ethical research" (p. 4), positionality is an attempt to increase the probability of "truthfulness" through transparency and to eradicate errors that creep into analysis due to bias of position. William James (1912) argues that science, in its drive to find the difference between what is *really* true and what is mere superstition or erroneous belief, has organized the "horror of becoming a dupe," (p.18) into "a regular technique, her so-called method of verification; and she has fallen so deeply in love with the method that one may even say she has ceased to care for truth by itself at all. It is only truth as technically verified that interests her" (p. 21).

The truth is, there is a growing sense that many of us do not fit within conventional research, and that the requirement for positionality does not – cannot – fix the problem and even

exacerbates it: its inclusion creates new exclusions. Only what is labeled as a position is included even though there will never be enough labels to meet the specificity of being. Yet who decides which positions count or who may do the counting? Can teachers speak about researching with the same ease that researchers speak about teaching? Can people from the working class make claims about the educated class? Can some of us only speak from within our own categories? Or as non-verbal autistic poet Tito Rajarshi Mukhopadhyay (2015) says, “Why shouldn’t the autistic study the neurotypical?” (p. 9).

Nor can positionality establish who each of us is in crossing the multiple boundaries of our identities or in its multi-layering (Andreotti, 2016): we each are many.

Nor can it capture the complex web of what is between us: “a radical and sacred interconnectivity that [can] not always be languaged” (Bhattacharya, 2021, p. 182). Or if it could be languaged, that it is, therefore, “up for grabs or discussion” (Tuck and Yang, 2014, p. 223) in research or for research.

Or that I *can* know myself enough to declare my positions or parse the difference between who I am and what I know. As John Caputo (2007) remarks, “How do you know who ‘you’ are? Where do ‘you’ begin and all the saturating influences of culture and education leave off? Is not the first step in self-knowledge to concede that we do not know who we are?” (p. 40).

Or that we have a stable self to find, as Eamon Costello (2024) considers, but rather “there is merely a tangle of thoughts, bubbling up from a pot of emotions, that arise from the body” (para. 6).

If once we look up from the boundaries our positions make, it might be possible to see other ways to think ourselves together instead of against. We might then move instead of getting stuck on positions and into positions. None of us is innocent of bias and partisanship or errors

and transgressions. Nor can research be made innocent – or true – through techniques. As Gayatri Chakravorty Spivak (2022) argues, “It is time to move, claim complicity, keep using what’s at hand, turn things around, rather than stockpiling unreal polarities” (p. 140). To do so, it is necessary, not to calculate more precise categorization and definitions, the addenda to traditional textbooks that make efficient instruments of us, but to look up and out from them to where things tangle, bubble, blur.

I do not claim, however, to have no positions.⁹ So far, according to positions that position me, I am a woman, neurotypical, at least in the typicalities that matter in education, working class,¹⁰ white, although recently, a Mowachaht/Muchalaht Elder asked me what my tribe was and when I said I had none, she said, “Ah, they didn’t tell you.” I mention this not as a move to claim “Indian blood” and therefore “innocence” (Tuck & Yang, 2012) but to bring to notice that in asking about my tribe, the Elder did not seek to categorize me but to connect me. When I sit with colleagues and students from the Nuuchahnulth First Nations where I am currently working to reimagine teacher education by moving the university to the community, my positionality is the land and all my relations, so that those listening can connect with me. After all, we are all thus connected: we are all from somewhere and we are all from someone. Yet, too, there are specific touch points revealed in listening for connection. This is different from staking out territory and claiming boundaries. I once watched tears start in the eyes of a speaker when a

⁹ Jen Ross (2023) in sharing her position, adds, “These facts may tell you something you need to know. Or they may not - there may be others, of which I am unaware or prefer not to share, that matter more” (p. 14). There is nothing simple or merely “factual” about a demand for positionality.

¹⁰ I have been continually surprised how often the identity of “working class” is left out of conversations (at least in Canada). As Andy Hargreaves (2020) notes, inclusion demands teaching “working-class identity as a history and culture of pride involving the dignity of labour, solidarity with one’s fellows” (para. 27). It cannot be conflated with poverty; wealth doesn’t make me “middle class.” To become educated should not demand leaving behind one’s identities but provide openings to a wider range of possibilities and connections.

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wizened man came up to him after the presentation and said, “I knew your uncle. He was a good man.” The speaker had grown up in a series of foster homes far from his family and had never met them. In such circles of introduction, I say that my long ago roots are in lands I have never been – Ireland and Scotland – or visited briefly – England – that my great-great-great grandparents settled in K’ómoks territory where my great-great grandmother was born, that my great grandparents, my grandparents and parents were born there, too, that I have many aunts, uncles and cousins, that I have lived always near the K’ómoks territory of my birth, that I am married and blessed with five children and 11 grandchildren. At the last, their eyes shine, and they lean across to touch me: “You are so wealthy,” they say.

With this research, however, I want to elevate what constitutes the practice of this research and directs its attention – teaching and therefore my identity as teacher. To do so, I must unfix the position teaching currently holds within research and, too, unfix myself from positions to which I have been fixed and that continue to keep me fixed.¹¹ Indeed, in telling my story of schools in chapter two, my positionality – my limitations, biases, idiosyncrasies – will be fulsomely unfolded: I must dig myself *out* of position to invent myself more expansively *as teacher* in order to invent a model for a teachers’ science.

After all, is it not for more fruitful becoming that we educate our children – and ourselves?

My high school students and I would often read Sue Monk Kidd’s article (2005) on the common heart as a starting place for considering why we read. In it she shares a time when she was holding a book signing for her novel *A Secret Life of Bees*. A man came to her and said that his wife made him read the book even though it was exactly the kind of book he never read. He

¹¹ Andreotti (2016) argues that “Colonialism is a theft of layers, an impairment of being where entanglement cannot be sensed or recognized” (para. 20).

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was a middle-aged executive from a privileged family in New England and her novel is about a teenage girl growing up in an underprivileged family in the South: "There couldn't be two more different worlds (para. 3)," he told her. Yet, as he read, a reading that he admitted to finding painful, he learned about surprising connections between himself and the girl. Kidd notes, "I consider the way we sit with a book for hours, days, weeks perhaps, seeing the world through someone else's eyes, feeling it with someone else's heart, how in one of the most mysterious transactions possible in human experience, the sufferings, ecstasies and yearnings of someone else become our own" (para. 8). "We lose ourselves in what we read," Butler says (2013), "only to return to ourselves, transformed and part of a more expansive world" (para. 3). We are transformed, not only when we read novels, but when we read science, as Richard Feynman (1998) describes, in learning that "the internal machinery of life, the chemistry of the parts, is something beautiful. And it turns out that all life is interconnected with all other life... The universality of the deep chemistry of living things is indeed a fantastic and beautiful thing" (p. 11-12). Or in the study of mathematics, its "breathtaking depth and heartbreaking beauty" (Lockhart, 2009, p. 25), its capacity to dream through imaginary patterns of ideas. Such transformations require openness rather than enclosures that severely restrict "what seems realistic, desirable, tangible and intelligible" (Andreotti, 2016), both in our lives, and, if it is to impact living, in research.

Confessing to one's position in conventional research, however, is insufficient for going on. One must also be positioned *within* a method, which, like positionality, increases the likelihood that whatever truth is found can be "technically verified" (James, 1912, p. 21). Scientific method allows scientists to verify their theories carefully and systematically through

“the concept of *control*” (Cohen, et al., 2011, p. 3) rather than in the “loose and uncritical manner” (Cohen, et al., 2011, p. 3) of laypeople.

I have yearned to begin, not by carefully describing the boundaries of this research or of myself as researcher, but loosely, openly, so expansiveness is possible – not to *dismiss* methodological research but to imagine other ways of researching. I want to begin from a position that brings no battles. Yet my very desire to set aside method, or rather, to displace it from the center of my research and simply to think and invent without restriction to “a” method and only “as teacher,” has provoked a long battle for academic approval. To say that I am “inventing” does not sufficiently position me. I have come to realize that my very opposition is another kind of position: I remain stuck.

I need to look up from method with a method that allows both “speculative audacity” for the invention of a new model for science, while connecting to the familiar for those who are thinking with me. Thus (although hesitantly, still, and cautiously), I will position myself within a method (rather than merely mentioning it as an aside): SF – speculative fabulation, science fiction, science in fiction; fiction for science; science as fiction. So far. It dwells in the indeterminate space between science and fiction and, too, between the actual and the possible – the realm of the “not yet.” Speculative researcher Jen Ross (2023) describes not-yetness as the “perpetually incomplete, always uncertain, not fully understood, but still expected” (p. 46). St. Pierre (2019) writes that the not-yet “is everywhere but indeterminate, not yet created, not yet individuated and organized into the definite – immanent” (St. Pierre, 2019, p. 4). Biology describes it as emergence, for example, in evolution, where the end cannot be pre-stated, because it occurs as things become in changing conditions (Kauffman, 2016). In literature, the not yet is a becoming through an experience of what is “not.” This research thinks with all these

perspectives and positions to fecundates possibilities for otherwise. It understands the not-yet as a place well known in the everyday language of the mother tongue: a dream that does not yet exist but that we long for and commit to making true. The “yet” is a promise.

Like post qualitative research, speculative research is still defining itself, still soft enough to make with.¹² Yet although only more recently becoming – or being taken up – as a formal method in social science, it is an ancient art and brings with it long memories of other ways. Of significance to this research is “so far”: thinking and making otherwise as we go is built into the method. A speculation can be understood as the invention of an idea to create or cultivate possibilities that make a difference to experience (Dewey, 1929b; Savransky, 2017). Richard Sandford (2021) argues that “to speculate is to somehow exceed established ways of thinking about what may be, to go beyond existing ways of understanding the world and, through experimentation, change it by developing new ones” (para. 17). Indeed, if education makes possible better living for our children, we must speculate. As Whitehead (1929b) notes,

Abstract speculation has been the salvation of the world – speculations which made systems and then transcended them, speculations which ventured to the furthest limit of abstraction. To set limits to speculation is treason to the future. (p. 60)

To speculate, however, is paradoxical; it demands thinking into the future. It can not yet be thought, and so is unthinkable (Savransky, 2017). To speculate – a requirement for inventing futures that are otherwise – it is necessary, on the one hand, to “unknow” what is already thought, and yet, to speculate for actual change, it is also necessary, as Haraway (2016) puts it, “to stay with the trouble” (p.1) or the “thing itself” (Woolf, 1928, p. 75); there must be a

¹² Jen Ross (2023) considers speculative research to “belong to the tradition of post-qualitative inquiry” (p. 13).

necessary tethering of speculation to matters of concern. However, explaining the concerns through scholarship (explanations and interpretations from elsewhere) sets us at a distance (away from the trouble), and thus out of touch with what is troubling. Telling a story, a heart sharing, one told at a fabulated table, a place of intimacy, returns us to nearness that can both “undo” knowing (after all, what do any of us know for certain in the vagaries of our own living) and restore to attention the matters of concern for our children. I hope, in this way, to move into a speculative space where invention in the actual places of teaching and learning becomes possible.

My position (so far): I am a teacher speculating in order to invent a model for a new science that will help us in the complex, difficult (beautiful) work of teaching's art to make other futures possible for children who bind us to each other. I invite everyone to the table with a concern for children and hope for their futures. Hope, writes Rebecca Solnit (2016), “locates itself in the premises that we don't know what will happen and that in the spaciousness of uncertainty is room to act” (p. xiv). Hope counts on our speculations, our inventions, our dreams – and our trust in ourselves and each other, so when the chance comes to make them come true, we leap.

A Pause for Precursive Faith

Leaping is seldom asked of us in research. There are steps. Most often, the end is decided in advance, and the methods, materials, limitations, theories, data collection mechanisms, tools of analysis, techniques for truth are laid out so that the reader can judge the validity of the research by ensuring that everything is in order to reliably reach the predicted end. Neither the researcher nor the reader is likely to get lost: the area of search is carefully roped off, the

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signposts set up, the steps carefully mapped. The reader's trust is gained by being shown the previously certified map the researcher is using, the researcher's position within it, and the new area of search and proposed destination sketched in. From the beginning, the reader has everything needed to judge if what is added fits the map and has the potential to be an improvement to it. They can make a judgement without much reading at all in the same way that Elizabeth St. Pierre (2019) argues that the researcher can "do" research without much thinking.

Yet there is another kind of research necessary, John Caputo (2013) argues, when "we admit we're really lost" (p. 241), and what we are searching for is another way to go on. There are no maps and to use an already created map, no matter how accurate, makes little sense. It maps a territory we are not exploring. Without a map, then, as we search (and the reader must come along), we inevitably turn down trails that, so far, go nowhere or are too overgrown to travel yet, and we must backtrack over and over to the beginning to find more promising paths. Without the preliminary map and signposts along the way, the reader, too, is lost. The only light is from the idea that a better way is possible and, too, the half-observed markings made by others who are searching, too. What is more, there is no advanced guarantee possible so that the reader can trust that when (if) we arrive, what we find is better. Indeed, the model for a new science at the end of this research is not something to take away or take up – it is not a "finding" or a "deliverable" or even, in itself, better than anything else. It is a gesture of otherwise that we *can* go on otherwise. It provides a different starting place, one that is responsive to our love for children and responsible for desirable futures for them.

Inventing an entirely new model for science, even if speculative only, seems ambitious (especially for dissertation research). Yet to make otherwise, it is not possible to simply add another section to an existing map. A new model for going on based on a different idea, this

different starting place for making *other* maps must be created. Although new facts or more evidence are unnecessary for its making, it does demand seeing what is already known differently. Education, after all, is a heavily mapped territory. Yet to see otherwise, that is, not through existing maps where we see what we expect to see, a revelation is necessary.¹³ Thomas Kuhn (1996) says that scientists whose speculative ideas lead to a new science often describe the “scales falling from the eyes” or a “lightning flash” (p. 122); a revelation, he argues, however described, necessarily *precedes* the revolution of a new science. What is more, even after the revelation – which cannot be explained but must be experienced – the model for new science, the idea for it, cannot use technical verification. It cannot yet be proved. Rather, it depends most often on thought experiments – further fiction for the speculative idea – that are designed, not to prove through evidence or via affirmation from credible or authorized others (neither is yet possible) but to provoke revelations in others to create the community that makes the new science. In other words, as William James (1912) argues, the belief (and what is a revelation but a new belief) “creates its verification” (p. 24). After a revelation, not only does one see otherwise but doing what one has always done is no longer tenable. Those who see otherwise *do* otherwise and thus begin to find the evidence to prove it *is* a better way.

Yet to begin to go on differently different ways to go on are necessary. Conventional research methods *prescribe* the way. To speculate, imagine, invent otherwise, is to open *other* ways. To do so, the researcher *cannot* already know the way; the destination is at best something

¹³ Our expectations make the unexpected invisible to us. In their simple experiment Chabris and Simons (2010) show a video and ask participants to count the number of times two players pass a basketball. Part way through a person dressed in a gorilla costume who walks in, pauses to wave, and then walks out. This, of course, is entirely unexpected. Shockingly, most of the participants do not see the gorilla. I have conducted this experiment numerous times and every time people who do not see the gorilla become angry. They think it is a trick I have played rather than an illusion of their own mind. We believe that what we see is all there is to see. A revelation does not let us see what does not exist but what we could not see before.

that whispers or glimmers, a beckoning light, a dream. Nor can the reader expect the expected. In *How to Read*, Virginia Woolf argues that to read fiction – and speculative research is more fictional than factual – “One should read it as if one were writing it. Begin not by sitting on the bench among the judges but by standing in the dock with the criminal. Be his fellow worker, become his accomplice” (p.43). One’s judgement is suspended, she says, “for one does not know what is coming next” (p. 50). Perhaps, like the reader of *A Secret Life of Bees*, it even feels painful, which is especially possible for those who expect to take their ease in a well-lit clearing of facts, evidence and argument. Yet while facts are restful, Woolf says, they cannot revive us, restore us, move us. Nor can they spark revolutions or revelations.

Even if I *could* already tell you the ending of this research, spell out the last two chapters, what exactly the model of a new science would look like¹⁴ and provide a description of the thought experiments that will be used as verification, I am not convinced it would make a difference to the reader. First, what is made is not the point of this research but what can be made from it and second, one cannot be told the revelation from which what is made is verified; it must be experienced. However, I can say that the revelation is not something we do not already know even if it cannot yet be said. As poet Audre Lorde (1984) says, “There are no new ideas still waiting in the wings to save us... There are only old and forgotten ones, new combinations, extrapolations and recognitions from within ourselves, along with the renewed courage to try them out” (p. 38).

¹⁴ At the request of reviewers, I have attempted to do, nonetheless. I have added two illustrations of the model of the new science in the appendices. Appendix 1 is an illustration of the whole text that includes an illustration of the model and Appendix 2 is a diagram and overview of the model.

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If we pause, here, to re-examine the orders that have dictated what is required (and are therefore guarded) in research, it is possible that other ways can be remembered. If you sit with me for a moment, before we convene at the kitchen table to hear my stories of schools, here in the Seville sun on the bench where the paint is now dry, setting down your heavy pack filled with expectations and things to do, leaving the facts in your pocket for now, and just allowing the sun to touch your face, the soft breeze to ease your mind, can you dream of schools where we gather our children as beautiful, as joyful, as nourishing and just? Can you imagine them, now, even before any details are filled in or the contours of possibility drawn up?

Is it not possible that what stands in the way, what guards against those dreams, is no longer necessary, and the only thing that stops us from acting on them is that we do not yet know how we can go on otherwise?

Is it not worthwhile to search, even if the path of this speculative journey is unmapped and the destination – which is not the invention of a model for new science but what it is possible to make with it for our children – is inchoate yet and it is not, and never can be, guaranteed to make our dreams actual? Certainly, when the option between one thing and another is trivial and the stake is insignificant, as William James (1912) points out, it makes sense to wait for the evidence to come in. We can ask for guarantees, or at least, a surfeit of proof, before giving our trust. But if it matters to us, and if its achievement depends upon many of us acting together – and surely this is always the case in education – a desired result “is a pure consequence of the precursive faith in one another of those immediately concerned” (p. 24). We must act together before the facts are in to make what is desired actual.

I cannot see another way to begin otherwise. Without first imagining another way, all our new ideas, better programs, innovative strategies, our new methods, and all the affordances of

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the latest technologies are folded into the way things are. They cannot make the different futures we dream of, which can only be made in the making of them.

Isabelle Stengers (2018), who also believes that another science is possible, argues that we need to get out of the habit of doing better at what we are already in habit of doing, unlearning "an attitude of more or less cynical ('realist') resignations, and becoming sensitive once again to what we perhaps know, but only as in a dream" (p. 81). Dreaming, at least the dreaming we dream of making actual, is slow work, and slow is more difficult for us now when the instant is so readily available to do what we have always done faster. Indeed, as Marshall McLuhan (1995) notes,

Our typical response to a disrupting new technology is to recreate the old environment instead of heeding the new opportunities of the new environment. Failure to notice the new opportunities is also failure to understand the new powers. This means we fail to develop necessary controls or antienvironments for the new environment. This failure leaves us in the role of mere automata. (p. 344).

Even with what is new, even the disruptively new, we follow old orders and do as we have always done, doing and doing over, going along instead of going on and making other futures. To do otherwise demands slowing, resisting, probing, troubling. Indeed, the very dreams our technology can make with us are lost in speed and, as we are increasingly aware with unregulated applications of generative AI, pose "a grave danger to democratic civil society and to individual freedom and liberty" (Williamson, et al., 2024, p. 20). So, too, in the slick pace of prose written in the father tongue, moving in one way and without the impediments of exchange, of returns and turns, of inaccuracies and banalities. Speed, Stengers, notes, "demands and creates an insensitivity to everything that might slow things down: the frictions, the rubbing, the

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hesitations that make us feel we are not alone in the world” (p. 81). Surely, we have time to take time to dream together for our children. After all, what if, in the end, what I imagine entwines with your imaginings and something better becomes, through us, for our children and our children’s children? What if we come to know something, something that was once unrealistic, even unimaginable to us, and yet knowing it at last, everything can be different?

Come! Let us gather with others at the kitchen table and as I tell my stories to unknow my way into invention, feel with my heart, and long with me for dreams that you remember, too, that call us into a place of beginning that leads everywhere and otherwise.

Chapter 2: Unknowing Stories

Well Meant

Twenty-five hundred tins of tuna,
no can opener.

Powdered milk that loosened unfamiliar
stomachs speeding death.

Three thousand Bibles dropped into
Mujahudden children.

One thousand blankets and sweaters,
sent to tropical hot zone.

Crates of suturing thread and no needles.
Thousands of candles and no matches.

Tubes of toothpaste and no toothbrushes.
Boxes of high heeled shoes.

-- Chris Abani

Chapter 2 Gloss

This chapter tells a story of revelation: the narrator realizes that in order to invent, contrary to the usual process of research where one finds out more about the topic of study, she must unlearn what she already knows - or thought she knew - about teaching. Her unlearning leads her to yet another revelation: she herself is complicit in the stagnation she is attempting to resolve, merely adding new chapters to the old story. She realizes that to invent a model for the science she dreams of, she must begin from a new premise - not a science of education as knowing better but a science for education as a practice of love. A reminder to readers: in the space between what is known now and what is yet to be known, as Virginia Woolf (1928) points out, "one cannot hope to tell the truth" (p. 6), if by truth, one means "verified truth" (James, 1912, p. 21). The narrator does not make truth claims and the reader is not expected to consume what is told but to draw their own conclusions "as they observe the limitations, the prejudices, the idiosyncrasies of the speaker" (Woolf, 1928, p. 6). In this way, stories become true.

Finding the way to zero

For unknowing, a precondition for invention, the literature review, a precondition for conventional research, is unhelpful and even contrary to its intentions. The purpose of a literature review is to fix the research *within* what is already known, assuring the reader that the researcher already knows the existing map of the territory and next steps that will *determine* their research. Unknowing, however, although it does not disregard or dismiss past knowledge and, indeed, can only begin after long effort to acquire it (Serres, 1995), is, in essence, a way to come to see what is known otherwise. The poet Jean Lescurie points out that unknowing (a process more familiar to artists than scientists) “is not a form of ignorance but a difficult transcendence of knowledge” (quoted in Bachelard, 1964, p 16).

Unknowing is unlike the giddy enthusiasm of first learning and most often painful, since it is necessary to unknow things long taken up as good or accepted as taken-for-granted, unsettling even our most settled understandings and to step into the vertiginous space of uncertainty rather than settling oneself more comfortably *within* what is already known. After all, as Dewey (1929a) warns, in considering how “to arrive at new truth and vision” (p. 246):

No one discovers a new world without forsaking an old one; and no one discovers a new world who exacts guarantee in advance for what it shall be, or who puts the act of discovery under bonds with respect to what the new world shall do to [them] when it comes. (p. 246)

Yet the very *idea* of unknowing transgresses what we often take for granted in education, that building incrementally upon prior knowing in order to know more is its *purpose*, as though, in this way progress is guaranteed. Yet this certainty closes out the spaciousness necessary for hope in other futures or, following from that hope, the discovery of new worlds. Indeed, both hang less

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on knowing better, but indeed, on our willingness to “surrender what is possessed, disowning what supports one in secure ease” (Dewey, 1929a, p. 245) and on our capacity to imagine otherwise, to invent, dream and speculate on alternatives ways to better living. To unknow is to move into the uncertain open where discovery is possible. To say always – so far...

Some unknowing is swift – a shock, a blow, a wound, or “an axe for the frozen sea within us” (Kafka, 1904, para. 1). I often read a letter to prospective teachers that was written by a mother of a child with disabilities. We sometimes think that the supernatural or, at least extraordinary – ghost ships, demon lovers, handsome drowned men, robotic cities in distant planets – is necessary, as Coleridge (1817/1974) puts it, to “awaken the mind’s attention from the lethargy of custom” (p. 353), but he notes that Wordsworth, in his quiet exploration of the everyday – daffodils, clouds, bridges – could as readily “excite a feeling analogous to the supernatural” (p. 353). So it is that a simple statement from a mother might strike us awake. She asks other parents not to praise their children for playing with hers:

When you say your kid is great because he/she chose to play with mine, at that very moment, your child went from seeing just another friend, to seeing kids like mine as different. They become someone defined by their disability, as someone who is somehow flawed, and only an exceptional person plays with them or becomes their friend. I know that is not what you are trying to communicate, I know that, but unfortunately, it does.
(Stumbo, 2016, para. 3)

The prospective teachers gasp. They tell of how often they have lauded the “kind” children in the classrooms who sat beside or helped a child with disabilities. Their praise was well meant, of course. They thought they were doing good by encouraging good deeds; they thought they were

including the child. Yet their very efforts, they realize with horror, countered the outcome they sought and, in fact, harmed those they thought to help.

Slower to unknow are the ideas that are taken for granted, that do not seem like ideas at all but simply the way it is.¹⁵ Awareness often comes in glimpses only that, over time, can come frequently enough, become substantial enough, to be experienced as a shock to thought (Massumi, 2002b). Margaret Atwood (2004), for example, in an interview, described her seminars at Harvard graduate school. Halfway through them, she said, the girls in the class would make tea and cookies and serve them to the boys. When the interviewer asked if she ever thought not to do it, Atwood shook her head and replied:

It was just what was done. That's what you did. And usually, within any period of time, there are things people take for granted. You do not think about them because that's how it is. It is only on the cusp of change that you think, "Why are we doing this?" (D'Souza, 2004)

In other words, it does not seem possible that anything *can* be changed. It is simply “done.” To do otherwise, to change and, in so doing, make change possible in the world, as Serres (1995) says, is to “learn to disobey” (p. 20), that is, to grow up from comfortable acquiescence with what is given as known, as the way things *are*, and to think about whether to go along or to go a

¹⁵ Taken-for-granted ideas are described as implicit biases in psychology research, what experimental psychologist Mahzarin Banaji (2019) describes as “the thumbprint of the culture” (4:30) in which we live; beliefs that are the silent, quiet work of our brains that we don’t have access to. Awareness of these biases is very much the project of critical research that continually questions, rather than accepts, the knowledge produced by research - that is, what becomes taken for granted by it (Cohen et al., 2012). Moreover, exposing such ideas can be considered the work of literature, as memorably phrased in full by Coleridge (1817/1974) “by awakening the mind's attention to the lethargy of custom, and directing it to the loveliness and the wonders of the world before us; an inexhaustible treasure, but for which, in consequence of the film of familiarity and selfish solicitude, we have eyes, yet see not, ears that hear not, and hearts that neither feel nor understand” (p. 353). Here, although I use the “mother-tongue” phrase of unknowing, these points of intersection that cross boundaries of our knowledges are important as openings for thinking otherwise.

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different way. In a static society, Dewey (2003) argues, acquiescence has meaning; in the constant change of today's world, "fixed and comprehensive goals are but irrelevant dreams, while acquiescence is not a policy but its abnegation" (LW.5.113). To make it the foundation of education for children is to forfeit our obligation to them. They must learn to disobey. So, too, their teachers. Indeed, disobedience is commonly considered a vital force in the practice of art. When we see teaching as art, Dennis Atkinson (2022) notes, disobedience "testifies to the versatility, plasticity and inventiveness" (p. 754) of its practice – and indeed, is its significant inheritance, where, in an always changing world, we must ongoing learn to "travel together differently" (Andreotti et al., p. 17). A teacher's primary lesson, bell hooks (1994) argues, cannot be "to learn obedience to authority" (p. 4): they must "teach to transgress" (p. 1) – and therefore, teachers themselves, must learn disobedience. Such teaching, she says, is well described by Pema Chodron: "Things are not certain and they do not last and you do not know what is going to happen. My teachers have always pushed me over the cliff" (quoted in hooks, 1994, p. 207): to learn one must leap.

Yet to risk by calling into question the comfort and rewards that going along can provide to those of us privileged to be able to go along is far from easy. It is much easier to notice, instead, the foibles and errors of others, to see the unenlightened ideas of the distant past or distant countries or even those of neighbours; to gleefully point to the speck in the eye of all these others rather than examine the logs in one's own living. Yet in the words of another sage, "To put the world in order...we must first set our hearts right" (Confucius, 500 BCE). It is, however, a welcome distraction to look elsewhere at *where there is no obligation to act*, where we do not ourselves have to leap off the cliff, offering advice as spectators from the sidelines. To

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unknow, therefore, is not to teach others what *they* must do differently but to attend in the turning places to which we are closest, so we make ourselves – and so our living – otherwise.

To find the way to zero (Serres, 1995), then – not to know nothing but to let go of the *hold* of knowing so that the invention of what is not yet becomes possible – everything must be called into question, but more difficult, it is necessary to call oneself into question.

Some days I look up from the books stacked around me, enthusiastically underlined with copious margin notes for my research and lectures and wonder how I got here, so far from home. Memories of children, teachers, classrooms grow hazy, softened, like a life told in snapshots, the sorrow, anger, humdrum of days erased, the noise, tears, laughter, bells, clumps of grass brought in from new mown fields after recess, the raised voice, a slammed door. I have been trying to extract something from those memories and onto this quiet page to convert into a doctoral dissertation and teach to my new students, those learning to be teachers, nuggets of truth they can store away and take out to set upon the shelves of their own classrooms. I realize I have become like the young man Virginia Woolf (1928) observes at the library, head bent, industrious: “the student who has been trained in research at Oxbridge has no doubt some method of shepherding his question past all distractions till it runs into its answer as a sheep runs into a pen...extracting pure nuggets of essential ore every ten minute or so” (p. 30).

Woolf recommends that to write, not only do women need a room of their own but they should *not* get trained at a university where ideas are so neatly shepherded, a sterile process of extraction and implantation, but if they do, to resist servile acceptance of its prescriptions of what is of worth, of *their* worth, for to “sacrifice a hair of the head of your vision, a shade of its colour, in deference to some Headmaster with a silver pot in his hand or to some professor with a

silver rod up his sleeve, is the most abject treachery” (p. 105). In other words, women must learn to disobey.

Yet I find myself hesitating here, gripped by a sudden unwillingness to begin this story, to put myself at risk, yet again, through disobedience (just do as you are told, I am advised by even my most stalwart supporters).¹⁶ I realize that what is harder yet is to call *myself* into question. In the thinking churned up as I try to coax myself forward, I now wonder if my family's horror at the facile father tongue I spoke at the kitchen table was not only at the strangeness of the words but the fear that I thought I “knew better” than them and more dreadfully, if I did, indeed, think so. Have I become, as my mother would say, “too big for my britches,” now that I am a professor at the university where I once learned to teach, now teaching others to teach. Have I become *confident*, which, as Woolf points out, can only be achieved with any ease in the ongoing difficulties of living we all face and the daily tests of its vagaries “by thinking that other people are inferior to one self” (p. 36) and, in seeing oneself through them, as superior. This superiority, she notices, must be protected at all costs for, if once those in the “looking-glass” of one's superiority “begin to tell the truth, the figure in the looking-glass shrinks; his fitness for life is diminished. How is he to go on giving judgement, civilizing natives, making laws, writing books, dressing up and speechifying at banquets, unless he can see himself at breakfast and at dinner at least twice the size he really is?” (pp. 37-38).¹⁷

¹⁶ An additional aspect of my reluctance is the fear that narrative as research, as Mike Michael (2022) points out, is very often construed as a means of “deriving or portraying someone's (a lay person, a practitioner, a social scientist) more or less well-demarcated reality” (p. 81). Fiction, however, never pretends to reality in the way that non-fiction does. My story is not “real” – or no more “real” than any story told at the kitchen table with all its hyperbole, omissions, and revisions. Again, the point is not in its “facts” but in its potentiality to catch facts in making from everyday life, dreams, memories, sorrows, desire and out of what matters so deeply that, as the poet Rilke (1954) puts it, “it is spreading out its roots in the deepest place of [the] heart” (p. 16).

¹⁷ One of the challenges of altering texts to accommodate modern sensibilities is that we can change intention. Although she uses the “universal” pronoun “he,” Woolf is referring, here, to men. However,

I do not know how to go on.

Recently I received an email from my university to inform me of a new strategic plan for student affairs framed with the vision: “Enter with Curiosity; Leave with Confidence,” and I picture all my students, and me, too, as a product of the university, coming in filled with curiosity, heads up, thoughts flying on the wings of imagination, and leaving it, focussed and efficient shepherds, careful miners, confident in our worth and ready to bestow it upon those inferior to us.

Yet perhaps since I have become a student, inferior once again and told over and over that my thoughts are inadequate – who am *I* to disobey? – I am shrinking and can fit my britches again. I am remembering things I have long forgotten to tell in my oft-repeated story of schools. I am coming to realize that I have been telling a glossy story, bent on yielding nuggets to justify my own long-held arguments. Even my failures have been written, as Felicitas Macgilchrist puts it, as examples of how we must “dust ourselves off, reflect on our mistakes, and move onwards to success” rather than as a “struggle for other futures” (Suoranta, et al., 2022, p. 229).

Now I want to find the *gaps* where my confidence trembles, where other futures glimmer, and through which I might arrive at what poet David Whyte (1993) calls a “place/ beginning to lead everywhere” (lines 16-17). A place where invention is possible.

Once upon a time

But trembling here, the well-travelled road beckons. Why not seek new beginnings in an analysis of trends in data, reports, current research, or recount and count many stories (other people's stories!) to extract themes?

today, her description can as readily apply to any of us who take up such “speechifying” roles. Surely, a great danger to beautiful teaching is speechifying.

Yet to do so misses the glimmers. We allow ourselves to become busy extracting, analysing, applying, and then delivering reports, so that not only does the log in our own eyes continue to obscure our vision but we collude in what Mike Michael (2012) argues is “a tacit process of sanitation” (p. 529),¹⁸ cleaning up (smoothing, organizing, categorizing) the mess and overflows to then construct empty futures, that is, futures “disconnected from the contexts in which they arose, freed of content that ties them to the configurations of social processes and action that give rise to future circumstances” (Sandford, 2013, p. 120). This emptiness is the space where “best practices” work, gliding friction-free in the vacuum composed and to which, distance education, perhaps, is more particularly susceptible with its seeming disentanglement from the frictions of time and place. The potentiality of futures, however, does not exist there. Rather, it *already* exists in the singularity of our own living; its emergence depends, Richard Sandford (2013) argues, on our futures becoming “embedded, embodied and enmeshed within networks of being” (p. 121), in other words, *living*.

Futures must be *made* true.

That making demands we sit together in slowness, gathering at tables such as the one fabulated here, to become a “witness to the eyewitness” (Palmer, 2014), to the ones who live or have lived in the place of vital contact at the point of living concern, accepting hesitations, eruptions, turns and returns, the tellings that overflows in omissions and ambiguities, waiting for what we cannot yet know and may only know in glimpses of a quickly fading glimmer. Yet that very witnessing opens us – not to the truth of other stories – but to our own, the stories we did

¹⁸ The very image of research often evokes sterile spaces, sanitized of any contaminants, and methodology as a means of conferring immunity to the researcher so they do not infect the research and are not infected by the living. To imagine fecund research is to step out of the laboratory entirely. Indeed, the very project of education, and therefore its research, is (or ought to be), Tim Ingold (2018) argues, “about exposure rather than immunization” (p. ix).

not dare to tell or had long forgotten, but ones in which we are enmeshed and *can* therefore act from otherwise – and in so doing, take a chance to “impregnate the world with new difference” (Savransky, 2021, p. 156) to make *living* futures.

I decide, at last, to begin the story before I was a teacher, before I was yet schooled by school, back, back, to when I was young. How often the stories of elders begin this way.

When I was young...

For me, the words call up seas and trees, picking salmonberries, skipping stones, playing cards on rainy days, the fire popping, and on Saturday night, if all the stars aligned just so and the antenna picked up the signal, Hockey Night in Canada, and a bowl of ice-cream for dessert. I grew up in remote rural logging communities. My first school was a one room schoolhouse where I was one of three children in grade one; in grade two, we moved to an even more remote location, inaccessible by road, where nine children from six to 16 were taught together. We lived miles and miles from the nearest town with amenities, without stores or movie theatres, no libraries or swimming pools, TV an intermittent and snowy single channel, and few or sometimes no other children but my brother and sister near. My youngest son always interrupts the story at this point to ask plaintively, “But what did you *do*?” I tell him about the games we played or invented, our favourite, when the new Sears catalogue came in, was “my page, your page,” and at each turn, you got to choose something from “your page,” and might get a new stereo or a very fine coat while the other player might get nothing better than a screwdriver. When the new catalogue arrived it meant, too, that we could cut up the old one to make paper dolls. “But what’s a catalogue?” my son’s daughter, Lily, now sitting at the table, too, asks, and I realize she knows nothing of the breathless anticipation of the catalogue in the mail – or the mail

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at all, really. Her world is filled with worlds mine knew nothing of: instant shopping, instant communication, instant information, instant games, instant learning. Yet, too, if I invited her to sit in the desk behind me – she is in grade two, just like me – she would have no difficulty settling in, solving the questions in the arithmetic workbook, answering the questions posed at the end of passages in the little readers, studying the spelling list, raising her hand to ask questions, lining up for recess. I can almost imagine us, hand in hand, going out to play on the swings together.

I worry, suddenly, about dreams in instant worlds. Can one still dream? Marshall McLuhan (1967) interrupts my wondering as I watch Lily swinging there, “Today's child is growing up absurd, because he lives in two worlds, and neither of them inclines him to grow up. Growing up—that is our new work, and it is total. Mere instruction will not suffice” (p. 18). It is with an almost electric shock that I realize he is not speaking of her but of me. Can those who are not themselves grown up teach others to grow up?

“The end, or the goal, of instruction,” Serres (1995) adds, leaning toward me, his bushy brows raised, “which is never enough in itself, is invention” (p. 133).

“An instruction is always a story cut too short,” says Stengers (Savransky & Stengers, 2018, p. 131) and she laughs (she is always laughing).

“Here at the kitchen table,” Joy Harjo (1994) chimes in, “children are given instructions on what it means to be human” (line 4).

But as I was saying, when I was young and easy (Thomas, 1973) and growing up, perhaps, less absurdly so far from the electric, most often I was sent to a corner to read by myself

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because I so quickly finished the tasks assigned to me. School took up very little of my time. Instead, I read voraciously from the little book shelf there, a limited supply of books well beyond my years, but with them, I spun such yearning for something beautiful that I imagined, something that spoke in the language of the poetry book I brought daily to school (my mother gave it to me, no doubt a relic from her own school days, so old and yellowed that the pages had come unglued from the spine and I had to carry it in a little plastic bag like a purse); or the book I found on the shelf (I wonder, now, who left it there) with a piano keyboard printed on its pages and I would play it, imagining melodies unfurling from my fingertips. I thought when I went to the next school this poetry and music and maps, and all manner of extraordinary things would be revealed to me.

I believed, with all my young heart, that my next school would sing.

Of course, in the way of stories – and living – that belief (or wish, or dream) did not come true, but as beliefs go, it feels like a good one still, one to stand by rather than discard, even though I do not know exactly what it means but can only feel its edges and contours. I believe that schools *can* sing for children, *with* children, and that it is something to live and work for, even while there is no certainty that it will come true.

Or do I need to grow up? Is to grow up to grow *into* dreams or *out* of them? Which would make a difference for children?

But I already know what it means to grow out of dreams. After all, I have seen the future.

Lily cried herself to sleep every night for a month when she was separated from all her friends in grade two due to a bureaucratic class size issue, and placed in a grade three classroom with an inexperienced teacher who folded up the stories, maps, and play, all the theories she

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learned in her university courses – I know because she was trained at my university – and pulled out the exercise books, readers, worksheets, tests.

As a girl, I do not remember crying, but I know I was disappointed. My felt experience of all those next schools was not only that it was mundane rather than magic, not only a kind of fill-in-the-blanks, follow-orders, do-as-you're-told experience, an ongoing exercise in acquiescence, but even, and this is something I am only recently able to say rather than feel, an assimilation into the way it is, a way that privileged certain skills and attitudes, the attainment of which was deemed successful and good. Those who are born into the way, so to speak, take readily to school, are “ready for school” as we often phrase it now, and those whose gifts, like mine, are in alignment with its ways are able to “rise” from their humbler origins to achieve this success, to become confident, superior even. Those, like my brother, whose magnificent gifts, honed in our communities, did not include reading, writing or arithmetic are shamed in school; there is a hammer blow of failing grades, scathing comments, disdain. I felt his shame with an anger that has never left me. And for my father. His school stories most often featured Mrs. Cartwright, who told him to sit at the back of the class and be quiet because he was too stupid to learn anyway.¹⁹

As I grew up, although I continued to believe that school *itself* was a dream, I became aware that some of us are barred from it, not barred in reality anymore, but by expectations only some can meet. So I allied myself with the freedom fighters like Nelson Mandela (1994) who also believed the dream of school and said so memorably, “It is through education that the daughter of a peasant can become a doctor, that the son of a mine worker can become the head of

¹⁹ “The social reality of any place,” Jack Katz (2004) points out, “exists not only as a present for those currently in occupancy but also as ... a future denied to others who took courses of action that led them elsewhere” (p. 301). But it could have been different. I glimpse another future with a fierce longing that is immeasurably sweet just before it becomes bitter.

the mine, that a child of farm workers can become the president of a great nation” (p. 194). And that the daughter of a logger can go to university, can even teach at a university.

At the time, I did not question directionality, this idea of what the pinnacle of achievement (and therefore happiness) is, or wonder yet, if through education it is just as important that a doctor's child can become a carpenter and a president's son, a childcare worker. I had not begun to consider, as I do now that I am a professor, that far future of the girl, whether even those who “belong,” whose lives are filled with books and piano lessons and trips to Disneyland are also disappointed in school and if their disappointment is sharper and their shame more secret because they do not question going along and accept that their worth is measured by how far they travel on that narrow path. But I was young, still, and at ease with my certainty and that there were things to be certain about. After all, as Sarah Amsler (2019) points out (and her generous words are a healing balm), “If we assume that this is the only way the world is and the only way it realistically can be, it makes sense and feels good to find ways of modifying or adapting to it” (p. 926).

When I first became a teacher, I burned for everyone to become doctors and presidents. I turned my zeal toward children like my dad and my brother who dropped out of school, and never forgot they were not smart enough, the Indigenous children whose lives and communities had been devastated by schooling, children from generational poverty for whom the demands and expectations of schools were impossible, quite literally, but were reminded daily of how they just needed to “try harder,” all the children whose difference stood as obstacles, the ones on the periphery, who did not or could not slip into the stream of schooling with ease like I did but

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drowned and disappeared or left. I thought keeping them in school was important, that if I could do so they would become whatever they dreamed of – or what *I* dreamed of for them.

As a high school English teacher, I quickly learned that a grave barrier to “success” for many of my students was their limited capacities to read and write beyond even a basic level and I enthusiastically set about seeking solutions. I was confident that I knew what the problem was – literacy – and that I could find the answer that would improve their lives. I implemented a school wide literacy program at the high school, advocating for technology as a learning ally for students, working with the teacher-librarian to build kits of books with a range of levels for literature and information circles to replace one-sized and out-dated texts to include a wider range of voices and experiences; I gave workshops, co-created department-wide assignments, implemented school wide assessments, and engaged staff in data driven dialogues to consider our progress and next steps. My enthusiasm and the subsequent improvement in student results led me to district work as a curriculum leader and to participate in provincial networks of inquiry to more widely share what I had been learning which included a deep engagement, both formally at university and informally through avid reading and conference attendance, with research not only in literacy, but from curriculum and pedagogic theories, leadership theories, as well as the burgeoning fields of psychology, neuroscience and, above all, educational technology. I was convinced, like many early adopters of technology, that all this knowing could be operationalized by computers, which, in the hands of "visionary" teachers, as Seymour Papert argued, was "an instrument of revolutionary change" (Papert & Roszak, 1997, p. 7).

Throughout those enthusiastic years, my focus shifted from the students to their teachers. There was so much knowledge about effective teaching and yet too few teachers were willing to take up these good ideas, these evidence-based practices from a wide range of sciences

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and fields of study. We had proof, after all, that they *worked* – and I had a veritable storehouse of the latest research at my fingertips as well as data organized into colourful and convincing charts from practice-based research developed with colleagues. Yet how, we wondered, those of us who had time (I was no longer teaching in schools), gathering around the board room, and eating sandwiches from a catered lunch, could we get *all* teachers to improve, to take up the good, strong, and wise practices that we, networks of enthusiastic (visionary) teachers, showcased for them. Certainly, in our passionate work, done, at least by those still in classrooms, in shreds of time – breakfast meetings, after school, summer institutes – we meant well. Yet in every school there were those who simply shut their doors and taught as they were taught, not only stymying our best efforts but spoiling the work we did for children who, just beginning to blossom under our best practices, gave up again faced with tests, readers, and rankings meted out by those other (inferior) teachers.

How, I wondered, could we motivate these teachers to engage in professional development and how might I present the information about evidence-based practices to convince them to implement what I was confident would improve their practice. Thus, beyond my ongoing research, my efforts turned to experimenting with pedagogy, or rather andragogy, using a variety of workshop models, learning rounds, coaching, learning networks, professional conversations, mentorship, offerings that were asynchronous, just in time, in pairs, small groups, whole groups. I was busy designing online resources and modules, going from school to school to coach, leading professional networks, presenting to groups large and small. But to my frustration, too many doors remained closed and at required workshops, those teachers sat at the back of the room, arms crossed. “Don’t worry about the curmudgeons,” I was told. “They’re just resistant to change; they are the problem, not you.”

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Yet I became uneasy. It grew upon me that something was wrong, something in what *I* was doing, that in all my enthusiasm, all my reading and study, I had forgotten something essential about teaching. I started to listen closely to the curmudgeons and noticed that they frequently said that they tried this or that or another strategy and it “didn’t work” or that I had not given them enough details so they could apply it under the various contingencies they faced.

It struck me that I was offering something for them to *invent with* and they were receiving it as a recipe.

I was missing something, I realized. I was giving them candles, but they had no matches to set them alight. *They* thought I was offering a gold nugget, fully formed, complete, something to fit neatly into the hole in their own practice and make it run smoothly. When it did not work, they set it on a shelf. They could *make* nothing with it.

So I returned to the classroom, choosing an elementary school, since my experience to date had been in secondary, and what was considered a “difficult” school in a low-income neighbourhood where many families faced the barriers, stresses, and ongoing challenges of poverty. Many of the children were diagnosed with learning delays and behaviour challenges and I thought I could be of use by applying many of the theories and best practices I had been learning so assiduously over the past decade. I was confident! At the same time, I enrolled in a doctoral program to formalize my inquiries into the “something” I was missing, choosing distance education not for its specialization but for its promise of openness, of expansiveness and as a larger canvas for exploration. I theorized that the problem of stalled practices, all those teachers with closed doors, was that the science and technology I had so ardently chased were at odds with the experience of classrooms not merely because teachers’ *knowledge* was insufficient but because teaching is complex and demands nuanced artistry; in other words, we were focusing

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on the wrong knowledge. I enthusiastically engaged with complexity theory and arts-based research, thinking that they would provide a lens through which we could pay attention to this *other* knowledge and if we understood it, then what we learned from the sciences could be seen as tools and resources rather than recipes for teaching's art. I spent years trying to articulate the art of teaching even as I practiced it. Yet in an elementary classroom where everything was new to me and teaching not just English, but math, science, social studies, art, French, applied skills and career education, where there were more difficult behaviours to understand and a greater range of diversity to support, I was daunted by the challenge of every day, never mind inventing every day. There were no leisurely lunches with colleagues, only a hurried sandwich before going to the gym to coach volleyball or to the library to tutor math. Meanwhile, experts came and went from the school and in and out of my classroom offering advice I could not use. I felt what I had long heard from teachers – exhaustion.

After five years of what was frankly gruelling, often demoralizing, and always humbling work as a grade seven teacher, coupled with my continued failure to bring my idea of art to fruition in my doctoral work, I accepted a position at the university, something I had resisted for years as too far from classrooms. Despite my faltering confidence, I still knew things, I thought. I had a strong understanding, after all, of the current education theories and it would provide me with an opportunity to continue to investigate my understanding of its art (without the Herculean effort of practicing it in the difficult conditions of a classroom) *and* to contribute to its dissemination. (The irony of my arguments slipped by me; I was simply tired.)

And so it came about that I returned as professor to the university where I had once been a student, a university that converts curiosity into confidence. Then, I studied methods courses (math, science, language arts, social studies, fine arts, PE) just as my students do today (two of

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their professors taught me as well). I took special education and education psychology courses (I teach them now) and I remember working on my framework binder before practicum just as my students do today, developing a philosophical frame of reference, a plan for management, a pre-assessment of the school, a class profile, student profiles, unit and lesson plans. There have been some changes to content: courses have been added in Indigenous studies and technology that did not exist when I was a student and perhaps could not even have been conceived at the time.

Issues in culturally responsive pedagogy play a greater role today; we think much more about inclusive theory and design.

For the last several years, teaching a course in the principles of teaching and learning, I have followed my students into their first practicum, conducting the course at school sites and joining them in their classroom experiences, an innovation since my student days. That is how I found myself, one day, sitting at the back of a classroom in the high school I taught in 25 years ago. Everything seemed so familiar: the blue lockers, the long halls, the classroom, the plastic chairs, and student desks. A few things had changed: there were whiteboards instead of blackboards, a digital projector replaced the overhead, and in the back, there was a cart of laptops. However, a still familiar scene from the days of my improvement efforts, the teacher stood at the front of the room and explained things to the students who sat silently in rows facing her. Sometimes she read aloud to them (these kids can't read, she told me) or asked them a question and then, after the silence stretched, answered it herself. Sometimes, she would stop talking and set them an assignment that meant using the laptops to find and synthesize information. While she talked, students mostly ignored her by scrolling through social media on their phones and, when writing, with very little effort or attention, copied and pasted information from rapid Google searches, punctuated by texting or scrolling on their phones. The absurdity of

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the two worlds they inhabited in that classroom struck me like a blow. Now, only a few years later, even this mild effort is reduced to a click with the advances in generative AI and the absurdity is magnified to the point of farce.

Sitting in the back of the room, I reviewed in some despair, not only what felt like the barrenness of my efforts toward sustainable and meaningful improvement of practice but also the fruitlessness of my intense efforts to advocate for technology, to provide in-service for teachers, in experimentation with students, even my enrolment in a Distance Education doctoral program, and my dreams of digital worlds as an open space for the new. While the ubiquity and advancement of technology now means that almost all our classrooms are, at least in part, conducted online, and online classrooms are able to almost seamlessly apply in-person techniques, transformation of practice through these advancements felt more remote to me than ever. Instead, technology seemed only to effortlessly intensify, amplify, and then replicate practices I had so long sought to change.

Still, back on campus, I rallied: I talked with renewed zeal about engagement, about co-creating experiences that matter to students, about self-efficacy and growth mindset, about universal design and inclusive practices, about culturally responsive and place-based pedagogy, student agency, attention, goal setting, about all the latest research, along with effective structures and strategies to support students to commit to their own learning. I talked, too, about the art of responsiveness and used a variety of strategies, processes, and modalities (including, of course, technology, but as a creative and assistive medium) to engage my students in understanding.

My enthusiasm felt urgent.

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I thought I was telling them something *new*, something that would overturn the stale practices that continued in classrooms, that were, it seemed, even more deeply entrenched than when I taught; I did not even notice that I was simply doing over what had long been done.

I know the exact moment when I finally did. I was wandering amidst groups of students discussing some problem or other I had set. I cannot remember what. Perhaps it was a discussion of a reading or a consideration of curriculum or thinking about a classroom issue and how it could be resolved. The buzz in the classroom was high, students leaning in to hear each other. Marina had her laptop open, ostensibly taking notes, but as I came closer, I could see she had an online shopping site open and was scrolling through a selection of skirts. She lifted her eyes to see me there, quickly closing the laptop, murmuring excuses and apologies.

I once had the dizzying experience of watching Marshall McLuhan (1964) on TV watching a classroom of students on TV who were watching a woman deliver a math lecture on TV. The interviewer asked McLuhan what he thought of this new use of new technology and with a twinkle in his eye and an almost-smile that he could not quite suppress, he answered,

A visual representation of the classroom is the last thing a television should be used for and it is mainly being used to simulate classrooms of the old-fashioned type. It's like dealing with the motor cars as if it were a horseless carriage and still trying to imagine the horses there. In the first motor cars there were places for buggy whips...we are dealing with the TV classroom and leaving room for the vanished horse. (26:40)

When I took my first course for my doctorate in Distance Education, filled with all the giddy excitement that this next school would bring, I received a textbook in the mail and was assured in the first chapter, a shock to my soaring imaginings, that countless studies had proven that there is

no significant difference between distance learning and traditional classroom learning: instruction delivered in either yields comparable success (Simonson et al., 2012).

But I *wanted* to make a difference.

Yet all along, all my learning and enthusiasm, my experiments online and with the latest research, I was making *no difference*. Whatever I said – or even *wherever* I said it – I was delivering knowledge from the podium, that is, from above, one way, where no answer was expected or heard, except what was repeated back to me because I *knew better*. They, on the other hand, wanted to know how to get students to put away their phones in high school classes or what to do when a kindergartener hits others or how to teach a student to read in grade five when she refuses all interventions; in other words, they thought I was addressing the wrong problem. *Because I stood at the podium*, they did not question whether or not there *were* answers. I wanted them to know that the answer to all those questions had to be created in place, leveraging the gifts and resources in community, and yet their experiences in classrooms offered few clues to what this meant beyond variations on rewards and punishments, diffuse and fruitless frustration (blaming parents, principals, policies, lack of resources, universities professors for ill-preparing them), or indifference born out of exhaustion that I can still feel like a heavy weight whenever I open a classroom door. Marina's discreet surfing was a polite version of Cody's rage, when 20 years ago in my high school English class, discussing a text he could not read and did not care about, he threw his copy of *The Crucible* across the room, crying out, "This is fucking bullshit," and stormed out of the room. It was the same message sent by the teachers sitting at the back of my workshops with their arms crossed and of Lily's teacher, who left behind the theories of the university as soon as she walked into a classroom. Or more painfully, a blow, a stab, of

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Paul, a student in one of my Communications classes, a course that gave students credit to graduate but not to advance in their education. He was a young man of simmering, often explosive and dangerous anger. He was convinced he was stupid, something he told me often, and was astonished to discover, not only that he *could* read, write, and think, but that learning could be about matters that mattered to him. At any rate, he was impressed enough with me to say one day, “Let’s really *do* something. I know you can make it happen.” He did not know what that was, but he knew it was different from what school was usually about. I can still feel the sharp edge of his disappointment.

I realize now I was misreading their message to me, offering more effective delivery, different texts, experiential learning, gathering more and more knowledge and finding different solutions for them, I, who *knew better*, and the result has been *no significant difference*. All those teachers, thousands, whose differences might have made a difference. All those children, thousands, who were telling me that something different was *possible*.

I remember suddenly what Gayatri Chakravorty Spivak (2003) says: simply being helped does not last if people “remain perennially in a place where wrongs proliferate” (2003, p. 614).

My breath catches in my throat. There are moments when I am afraid to go on.

Shocks to thought (glimpses of otherwise)

Rereading Dewey not only inspired my dissertation but sent a shock to my thought. Speaking from *a century past*, he (2003) argued that “the vast mass of American elementary schools show no trace of the influence of advanced educational theory or practice. They are practically what they have been for the last fifty years; worse, one is tempted to say, but that

perhaps is an exaggeration” (LW. 2.117). My students have been trained in the idea that I endorsed, whatever the content of my lectures and workshops, that something, *some knowledge from elsewhere would deliver them for whatever problem they faced*. They waited for a better recipe or a better expert than I. Like the students who Dewey (1929b) taught, or perhaps even more so, given our increased confidence in the capacities of science, they identified teaching ability with “the use of procedures that yield immediately successful results” (p. 15). Success is what is measured to define it and while what is measured might have changed in the last century, the belief that it *can be* has not. Thus, then as now – and who can blame them – prospective teachers, mine as did Dewey’s, “want very largely to find out how to do things with the maximum prospect of success. Put baldly, they want recipes. Now, to such persons science is of value because it puts a stamp of final approval upon this and that specific procedure” (p. 15). After all, then as now, science is the authority to which people turn – bolstered today by its rapidly developing technology “saturated with promises of speed, simplicity, and efficiency” (Ross & Collier, 2016, p. 18).²⁰ It is through scientific expertise that someone can deliver (swiftly!) the needed knowledge with confidence, the professor down the hall, for example, who never falters, who knows exactly how to teach best and how the students ought to teach and what they ought to know – and has an arsenal of evidence to prove it, like I did, back in my enthusiastic days before I lost my confidence.

²⁰ This “approving science” is better understood, perhaps, not as the actual sciences as practiced by scientists in a wide variety of complex and evolving fields but what poet and philosopher Jan Zwicky (2012) calls “a collection of ideological commitments, methods and principles” (p. 33), an allegiance, especially amongst non-scientists, to a Baconian perspective – that science makes unbiased judgements about what is true and not true via systemic argument, “deductive relationships to self-evident premisses or inductive relationships to reliable observation” (p. 33). It is a story - or model - of science through which one sees the world, and by which one goes on.

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I realized it did not matter what method or strategy I chose or even the medium ²¹; as long as the mode of delivery remained the same, that of transmission from one who is superior (who knows better) to one who is inferior (who lacks something, either this better knowledge or the capacity to get that knowledge). In other words, even if I teach students to use exploratory or experiential methods, for example, but teach them *as a means* of delivering what a teacher knows better, these other methods are co-opted to its purpose. Everything – even decolonization strategies or strategies designed for democratization or strategies for collaboration or inclusion, as long as those lessons are learned to better deliver better knowledge to those who “need” it, nothing can change except the dressing of things.²² The grammar of schooling remains essentially the same (Fullan & Edwards, 2022; Selwyn, 2016).

Michel Serres (1995) says, “It's much harder than we think to guard against accepted ideas, because often the ideas that seem the most modern, that suddenly mobilize a whole community – its media and its conversations – are agreed-upon ideas” (p. 145). I have been riding on the crest of each new wave of accepted ideas for years now. To take up something new, something that is not yet, on the other hand, is to stand on the edge of a precipice, knowing that you know nothing about what lies ahead.

How is it that I have so long forgotten what I have always known – and indeed fought for. I am the mother praising her child for being kind to the child who is disabled; I am Margaret Atwood serving tea and cookies to power. “If you are the dealer, let me out of the game,” sings Leonard Cohen (2016), “If you are the healer, it means I'm broken and lame / If thine is the

²¹ I cannot even hope, now that the future is upon us, that Dewey's dreams for educational change can be made possible at last, as Seymour Papert (1999) argued at the turn of the century, via the “army” of children and visionaries inside the Trojan horse of technology, and with which, therefore, progressive education for democratic futures can come into being.

²² As Tuck and Yang (2012) note, “The easy absorption, adoption, and transposing of decolonization is yet another form of settler appropriation” (p.3).

glory, then mine must be the shame” (lines 1-3). I have become a dealer, a healer, and standing in front knowing better, mine has been the glory.

Meanwhile wrongs proliferate.

At the precipice

I have run myself into a standstill, stopped here at the edge of a precipice. I know nothing.

Where have all my enthusiasms, all my knowledge led me but far far from the dreams of the little girl who can still recite by heart the words of Tennyson (1842) from repeated readings in her cherished book:

Break, break, break,

On the cold grey stones, O Sea!

And I would that my tongue could utter.

The thoughts that arise in me. (lines 1-4)

What did I dream of? What could I not say yet? Or even now?

Benedikte Zitouni, a sociologist from far away Belgium, seems to reach across the fabulated table where we are convened to touch the pulse point in my wrist. She speaks as one whose parents are not formally educated. Our dreams, she says, are not a desire to be educated, not merely to accumulate knowledge:

When one doesn't know what the university is, except through hearsay, when the university is in the distance, just on the horizon, then one has this naive idea but one which I think is nevertheless important: the idea of having the university open up for us other dimensions of understanding the world and other cerebral connections. In order to

make a better life, I repeat, in order to make a better life. (in Stengers & Desprit, 2014, p. 137)

Her words ring a bell of remembrance. “The art of life,” Alfred North Whitehead (1929b) says, “is first to be alive, secondly to be alive in a satisfactory way, and thirdly to acquire an increase in satisfaction” (p.5): to live, to live well, to live better.

To live better is the dream, surely, that we dream of when we send our children to school, not to become passive vessels to be filled with a *right* life but as guardians for and creators of better futures (Dewey, LW.17.463).

“Education,” William James (1899) says, “enlarging as it does our horizon and perspective, is a means of multiplying our ideas, of bringing new ones into view” (p 293).

This idea of education, surely, leans beautifully toward better living.²³

It is not school itself I longed for, or this knowledge piled on knowledge, a heavy weight I have dragged with me and meted out to others as though I was passing them something of worth, well burnished by scientific proof, a trophy, a prize. “It is very easy for science to be regarded as a guarantee that goes with the sale of goods,” Dewey says (1929b), “rather than as a light to the eyes and a lamp to the feet” (p. 15).

What will science bring light to? This is what I have forgotten.

William James (1912) reminds us, “Science can tell us what exists; but to compare the worths, both of what exists and of what does not exist, we must consult not science, but ... our heart” (p. 66). After all, science, too, he says, is informed by the heart in its belief “that the

²³ In essence, it might be possible to name the project of public education utopic, at least in the sense that Sian Bayne (2023) uses it, “not to prescribe or define a singular utopia, but as a way of trying to understand how, as educators, we might work with the widely felt desire for a better way of living” (p. 2). On the other hand, the label (and with the labelling, all the arguments that ensue) might be redundant. As William James (1907/1981) notes, “Surely the only *possibility* that one can rationally claim is the possibility that things may be *better*. Any other desire makes little sense” (p. 56).

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infinite ascertainment of fact and correction of false belief are the supreme goods” (p. 66). This, after all, is *unprovable*. And yet, it underpins education research which informs teaching and learning, and so our children.

Students hand in to us their picture, a yellow ball sun, a house leaning companionably toward the green tree beside it or a poem, carefully recopied, filled with all the cliches of early efforts and their heart, too. It is exactly *in this moment* that beautiful teaching can sing and learning take flight. Yet, we who have been corrected in correct methods correct them as though *that* is what matters, remind them of criteria, of straight lines and verisimilitude, about including an example of simile in their poem. Then the light shining in their eyes goes out and they look down to make corrections. Just do as you are told, I am told, even now, at the very end of my education. Choose a method and follow it. Make corrections.

Difference disappears.

But everything *could* be different.

After all, the *idea* of (conventional or modern) science, Dewey (1929a) says, is fueled by the belief that “it is only error that the mind needs to cut loose from, and that it can do this by direct appeal to nature, by applying pure observation and reflection to pure objects” (p. 219). Yet although it has proved useful, it is *fiction only*, he says:

Objects of knowledge are not given to us defined, classified, and labeled, ready for labels and pigeon-holes. We bring to the simplest observation a complex apparatus of habits, of accepted meanings and techniques. Otherwise observation is the blindest of stares, and the natural object is a tale told by an idiot, full only of sound and fury. (p. 219).

What is of further significance is that there can be no such mitigating fiction that the social exists in the way of the physical. Again, the difference, he says, is not as it seems in the physical world,

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“between a belief which is defective or false and an existence which is real; it is between an existence which is actual, and a belief, desire and aspiration for something which is better but non-existent” (p. 220).

I try to untangle everything, the little girl who was me, Lily, the children I taught, all my enthusiasms and aspirations, the realization of my own complicity, the proliferating wrongs and the idea that science is not the problem, but our worship of it, and the reason for that worship, that science gets rid of all the idiosyncrasies and false opinions in the way of our progress, and yet it is something, something about those idiosyncrasies, and singing, and leaning houses and laughter that I need to say and everything gets more tangled the more I try to tidy it up.

Recently, I noticed silvery tracings on the sidewalk, the palimpsest of newborn slugs, meandering, swirling, circling patterns. I wondered where they were going. But I know. They were going somewhere better. Every time I tell the story of school I see anew, thinking – aha, at last, I have the solution! But I have been trying to erase the traces, reducing, rather than multiplying, making corrections and cutting threads instead of taking them up and weaving with them something longed for, always.

I remember and the remembering is swift, an axe blow.

This is why we are sitting together here at the kitchen table, thinking, consulting our hearts. What is needed now is an idea, an audacious idea, one to replace the idea of right answers drawn from facts as our highest good and education as correction.

But we already know what the idea is. We knew it as soon as we sat at the table. Love. “Love,” Kafka says, “is everything which enhances, widens, and enriches our life.” (in Janouch,

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1953, p. 100). Surely this is also a definition of education that sings, that is beautiful, that moves toward the better living that we dream of for our children.

What does such love look like as the *idea* for education, not just in the primary grades, where it is almost taken for granted, but up and down the systems – in our workshops for teachers, in our universities, in our research and underpinning our science? I do not know yet.

But do you notice, already, how *different* it feels?

Chapter 3: Inventing for Invention - An Educational Method

Everything

Everything's looted, betrayed and traded,
black death's wing's overhead.
Everything's eaten by hunger, unsated,
so why does a light shine ahead?

By day, a mysterious wood, near the town,
breathes out cherry, a cherry perfume.
By night, on July's sky, deep, and transparent,
new constellations are thrown.

And something miraculous will come
close to the darkness and ruin,
something no-one, no-one, has known,
though we've longed for it since we were children.

--Anna Akhmatova²⁴

Chapter 3 Gloss

In this chapter, the narrator attempts to connect the idea of education as a practice of love to university expectations for dissertation research, particularly the expectation of an accepted method. She wrestles with her concern that method is inextricable from the old story based on knowing better rather than one that begins with love. However, she realizes that she needs to rethink method rather than discard it, to find loving methods that tell a different story of science. Since invention, she realizes, is a method of love, and speculation is the first step for any revolution, she reconciles with her method of speculative invention. She then reflects on science as it has been inherited and considers the possibility of inheriting it in a different way to invent a science in symbiosis with art as John Dewey outlines. She considers, too, questions of ethics, standards and verification that must be re-examined for a loving method. While everything, at first, seems more complicated since the taken-for-granted must be taken apart, in the end, what is uncovered, although not less complex, is simpler, since answers are heart-deep and near-at-hand.

²⁴ Anna Akhmatova not only imagined otherwise but, in continuing to do so, despite living in Stalin's totalitarian regime, during which her former husband was executed, her son arrested and tortured, the very existence of her poems a threat to her own safety, reminds us today of something forgotten and, surely, necessary to our future dreams. To tell us, she wrote her poems, memorized them, and then burned the paper they were written on. In them, she writes of other histories, dreams, sorrows, desires that were being erased and out of which other futures can yet be made (Puchner, 2017).

Staying out of battles

It is with some trepidation that I turn back first, as promised, to the expectations of the university for methods, data, and verification before moving forward to the concerns of children, teachers, schools and how I will experiment with and from the idea of love to invent a science for the art of teaching. It is difficult to imagine thinking about those expectations except through the lens of argument or, indeed, judgement. I want to leave it all behind. Imagine! Invent! Start from zero (Serres, 1995)! Whitehead (1929a) writes his words from my heart, “When one considers in its length and in its breadth the importance of this question of the education...the broken lives, the defeated hopes...which result from the frivolous inertia with which it is treated, it is difficult to restrain within oneself a savage rage” (p. 14). My rage, not yet stilled, gives me pause. I am not yet ready to invent if I want to battle or feel embattled. Indeed, reading over my story, I noticed that all sorts of shrillness crept in. I who have never left school, instructed, and then instructing, am entangled in the idea at the heart of science, that we can get it right, that there is a right way, and all we have to do is follow - or write - the instructions for doing so. Have I been merely sifting for gold nuggets, again, a *new* gold nugget, as though, once found, I might fix everything that is wrong? Have I been seeking the “novelty of the newest new” (Kuntz & St. Pierre, 2021, p. 478) within the already-thought, making myself, thereby, at least two sizes bigger in the mirror, an Inventor of a New Idea, as though God-like, I create from nothing?

Although I wondered if it might be time to get down from the kitchen table to formally discuss university things, and if not adjourn to the podium, at least to a library on campus, somewhere snug and smelling dustily of books, I have changed my mind. Here, I remember that I am thinking with friends who lean in to think *with* me, *make* with me; there is no battle, and I have nothing to prove. I have been lost for days, now, in writing, rewriting, and deleting

thousands of words of argument, explanation, justification. I cannot see a way to make a difference in *actuality* for children with them. Yet neither can anything be made with the story made from my living experiences if it slips into sentimentalization which, as Dewey (2003) argues, is “the necessary result of the attempt to divorce feeling from action” (EW.5.93) or stops at condemnation of all those years and years of committed work in schools. Isabelle Stengers reminds us, “We do not need to judge away the past as if what we are adding to it would somehow be what it was missing” (Savranky & Stengers, 2018, p. 133). What we must invent are new ways to *respond*, she says, for asking “what happened to us?” not as a lament but as a source “for telling our stories in another way, in a way that situates us otherwise – not as defined by the past, but as able, perhaps, to inherit from it in another way” (Stengers, 2011, p. 14) toward what *else* is possible. The possible, after all, John Caputo (2018) reminds us, “is the ultimate resource of the *future*, of the *renewable*” (p. 55).

I want to tell a story of method at the kitchen table so that children and parents and grandparents and neighbours and anyone for whom our work is a matter of concern can stay, too, and so that we stay with them, *widening* the range of truths we make with. Too often, we “consult” with the “people,” and then adjourn to private rooms at the university to pour over the data we collected from them, and then, after sifting, sorting, analyzing, find the answers to hand down in our reports, studies, policies, and laws for solving whatever problem we gathered them together to discuss. If we let go (or keep trying to let go) of the idea that somehow some of us know better and therefore *are* better, we can tell stories in another way, and there is no need to convene elsewhere. When we convene only to extract information (ribs, blood, bones, and other data), *we* become the stories that others gather to heal from, as Eve Tuck (2009), an Unangañ scholar of collaborative Indigenous research, reminds us:

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Stories of teeth counting, rib counting, head measuring, blood drawn, bones dug up, medical treatment withheld, erroneous or fabricated ethnography, unsanctioned camera lenses, out-and-out lies, empty promises, cover ups, betrayals, these are the stories of our kitchen tables. (p. 412)

I want to bring university things to the kitchen table, instead, where our knuckles are rapped if we get above ourselves, and what we know always slips through our fingers just when we think we can pin it to the board to explain it, and who we are, too, shifts and changes, since we are reinvented with every encounter and every experience, and where, hearing your stories, I become you and you, hearing mine, become me, so that when your child says he is too stupid to learn, I am heartbroken, and when Lily cries in the night about school, you say, but this is intolerable. We put our heads together. This is the method of kitchen table research.

But sitting together and talking about the problem at hand, each problem its own weight and weighty to us is not a method in the academic sense of the word. I have several thick tomes beside me on research methods in education filled with words like epistemology and ontology and axiology and descriptions of decisions to make about whether this is qualitative or quantitative research and what the theoretical framework is and how data will be collected and analyzed: I can only speak with them in the father tongue and nothing seems to make sense of children, for children, with children. The methods only seem to take me *away* from them and to capture my thoughts in a way that prevents the invention that is the purpose of this research.

I remember my daughter telling us at the kitchen table that she was examining a patient who had a rash and, how, in describing it to her preceptor, she stumbled for words. Certainly, she knew that “bum crack” could not be right but what else? She was settled on “crevice of the bum,” and we laughed ourselves into tears. Her preceptor was not amused. “Never use common

language,” he told her, “It makes patients think you do not know more than they do.” It did not matter that she did not know more; the point, she was told repeatedly over the years, is not to show it. Otherwise, I realize now, how could doctors go on.

No one ever thought to wonder what difference this young woman could make, hardly more than a teen with all the freshness of living near seas and trees still clinging to her. Or what it might have meant for all of us who yearn for something different from our healers than the information that is now at our fingertips.

“Technical vocabulary,” Serres (1995) says, “seems even immoral: it prevents the majority from participating in the conversation, it eliminates rather than welcomes” (p. 25). It is not loving, certainly, and I do not think it is meant to be.²⁵ Although it is not always possible to speak in a language that others know, the mother tongue is nonetheless going two ways to seek connection not exclusion. We do not have to all speak the *same* language. The language of the heart, after all, is only ever said in partial translations and each of us knows things we cannot say easily or find ourselves stumbling for words in new places with people we have never met or in describing things new to us or that are entirely new. What is necessary is that we do not talk down to others; we are not handing them our nuggets of gold, our pearls of wisdom to which only a polite “thank you” is expected. Indeed, the use of technical language separates in every direction since researchers can only speak to researchers in their own area of expertise. And then our expertise sits on shelf, unused, and closed to more expansive invention. We are divided by it from each other and then how can we go on *together*.

²⁵ Technical vocabulary can serve darker intentions, too: automatization of education and, therefore, teacher as automaton are “concealed behind a new wave of corporate buzzwords: blended learning, hybrid instruction; digital scaffolding; synchronous and asynchronous learning; micro-credentials and so on” (Suoranta et al, 2022, p. 225).

Here, then, where we have come out of our separate rooms and are sitting together at the kitchen table in friendship and trust, the specialization and one-wayness of the father tongue will not do. We are attentive not only to who is eliminated from its discourse, but what is missing. Even as we take up university things, therefore, we must continue to speak the *common* language, which in its *amplitude*, its inventiveness, is always reaching for the things it cannot say, all the ways to turn toward each other to exchange, not to transmit, to connect, not to divide or distance, not in trickery (even as benignly named as motivation or nudging) but in trust. That exchange, that connection, that turning toward is only possible with love, not rage which turns to the task of overcoming rather than to the thing itself. If there is rage, it is not a good story yet, not one that heals, renews, rejuvenates, makes newness possible.

Speculative inquiry in the mother tongue

“I believe,” says Margaret Wheatley (2002), “we can change the world if we start listening to one another again. Simple, honest, human conversations. Not mediation, negotiation, problem-solving, debate, or public meetings. Simple, truthful conversations where we each have a chance to speak, we each feel heard, and we each listen well” (p. 3). Yet, she adds, it is difficult for us to accept and believe in simple solutions and processes anymore. Everything has become a technique:

Once a simple process becomes a technique....it becomes the specialized knowledge of a few experts and everyone else becomes dependent on them. We forget we ever knew how to do things like conversations, planning, or thinking. Instead, we become meek students of difficult methods” (p. 20).

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It is meekness and dependency that I resist here, as well as closures and exclusions. To invent I cannot become *subservient* to a method but to think with it nor do I want to invent yet another specialized method that excludes the possibility of thinking *in common*.

At first glance, declaring myself as a speculative researcher is a small concession, since it seems to be defined by its expansiveness. Houlden and Veletsianos (2022) point out that “speculative research methods, which afford creative and exploratory ways to examine, produce and rethink both futures and relationship to futures” (para. 1) have mushroomed since the COVID-19 pandemic as a way to rethink the return to “business as usual” of continued colonizing systems. In addition, the pandemic served as a stark reminder that technology in education, commonly characterized, Jen Ross (2017) points out, by “attempts at control, efficiency and enhancement” (p. 214) must shift focus in rapidly changing and uncertain futures to “engaging with complexity, uncertainty and risk, not as factors to be minimized or resolved, but as necessary dimensions of technologies and practices which are unknown and in flux” (p. 214). Thus, she says, instead of research designed to be replicable and generalizable, speculative research can lean toward “envisioning or crafting futures or conditions which may not yet currently exist, to provoke new ways of thinking and to bring particular ideas or issues into focus” (p. 215). In other words, speculative inquiry looks to the future to act *for* futures not to think *about* futures (Atkinson, 2021).

Given its futures orientation, Houlden and Veletsianos (2022) argue, speculative research is “thus less bound to institutional outcomes and norms, which better enables the exercise of radical imagination, thereby inspiring and ideally participating in the kinds of changes we hope for our educational systems” (para. 12). In other words, they argue, the speculative must think its

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way out of “the highly regulated and enclosed ways in which we produce knowledge *in* the academy and *for* the academy” (para. 13).

A concern, however, is that once something becomes, as Serres (1995) warns, what “everybody” is talking about, those ideas have already been passed through the “institutional disimagination machine” (Houlden & Veletsianos, 2022, para. 14) that brings them into its enclosure. What results is new packaging for the already-thought. As Haiven and Khasnabish (2014) argue in their investigation of radical imagination as “commons” (research as “everyday”) rather than “enclosure” (research as monopolized by the academy):

Many of the current trends in social movement research...largely seek to transform and translate social movements into unintelligible academic jargon for the purposes of publication, with the ultimate material benefit (jobs, tenure, promotions, etc.) accruing to the researcher (p. 13).

Indeed, anti-colonization researcher George Dei (2022), in considering the recent “popularity” of decolonization, notes that it “has increasingly come to assume a comfortability, an appealing terminology” (Dei, p. 679). Yet as Spivak notes (2022), to point at colonialism as the “enemy” to be eradicated while enjoying the luxury of its benefits is duplicitous and divisive; it turns us from turning to what matter. Speculating on decolonized futures, or more generatively, toward loving spaces for all children, inclusive spaces, demands, Dei (2006) says, “not bringing people into what already exists; [but] making a new space, a better space for everyone,” necessarily *upsets* what is.

Indeed, almost a century ago, in *A Room of One's Own*, Virginia Woolf (1928) creates what Mike Michael (2022) calls a “speculative intervention” (p. 81) that upsets what is and invites a not-yet imagined otherwise. Richard Sandford (2021) argues that “speculation...is not

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about simply imagining something new in the privacy of your head—it's an intervention in the world, one that you (and it) are carrying out as part of the same process of imagining it" (para. 15). The complexity and ambiguity of Woolf's intervention (Favre, 2020) continues to offer perpetual beginnings (Ingold 2022). She neither predicts nor prescribes what will become from a room of one's own except to argue that without it, a future where her fabulated Shakespeare's sister, long silent and buried, but who lives in living women as a "continuing presence" (p. 112) will not be born. The opportunity, she says, latent in living women, exists in the ongoing preparation for her coming, so that she can inherit a different world (a new space, a better space) made by women writers yet to be known who work, "even in poverty and obscurity," – or even, for some women in some places in some times, at risk of death – for the possibility of her birth (p. 112). Yet it will be *worthwhile*: we who toil in the present make possible the impossible futures we imagine. Virginia Woolf in dreaming forward invited women (still invites women), not merely to dream, but to act *for* those dreams that make the future.

My insistence in speaking of invention and speculation as much as possible in the mother tongue and from the stance of teacher is not to exclude specialism, far from it, but to open space for a wider imagining than is the concern of the institutional "machine" (Rausch & Veletsianos, 2022, para. 14), which, despite individual efforts and large movements for change, seems to have become more efficient in the last century since Virginia Woolf (1928) warned women that simply attending university would not bring them freedom and, in fact, might jeopardize it.

Indeed, to stay at the kitchen table, however homely next to more exotic imaginings often considered in speculative research, demands a *more* radical imagination because we must think together in the near places where we have *an obligation* to act. To take up that obligation is to refuse complacency and to accept our own incompetence in the face of it. As Spivak (2003)

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notes in her attempts to teach teachers in rural India, “It took me the longest time to learn what the nature of the bad teaching was...that is a long process, because you cannot undo thousands of years of oppressing the mind through these nice kinds of Montessori-style experiments” (p. 623). To undo oppressive teaching as we undo our own requires profound humility and attentiveness to quick certainties. “The moment you feel it's really working,” Spivak says, “you have to stop and ask yourself, for whom is it working?” (p. 623).²⁶

I lean across the table where my mother sits. (I realize suddenly, sorrowfully, that my brother and father are not here. My sister, although in the room, pretends to be busy washing dishes, making tea, cutting sandwiches. Invitation is not enough to welcome those who have been long excluded.)

I tell my mother that I am trying to imagine another way of going on in the future, one that is more loving and beautiful.

“Won't happen,” she says. “People are people. But there's no harm in trying.” She is neither confused by the explanation of my method nor surprised. After all, it is why I have been relentlessly educating myself.

But I have an idea, I say, for making that dream actual. A process to help teachers to help children to grow into loving ways so that *they* create a more beautiful future.

“Might work,” she says, but her eyes slide away from mine. She does not have a lot of faith in humans.

²⁶ Her question barely slows us now as we gallop into the future at the speed of ever-improving technologies that gather, analyse, and then generate data on “what works” to ensure improved learning. The apparent accountability they produce answers Spivak's question with rapid disaggregation of data to “drill down” to who is doing the learning, what they learn and then generating efficient strategies for support that can then be implemented and monitored. The still slow question of what “what works” is working *for* slips by us (Ross & Collier, 2016).

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To speculate, dream, imagine into the future and then, from that dreaming, develop a scheme, map, model to allow or facilitate its happening is as easily understood and as commonly undertaken as conversations. It is how humans have been going on across centuries. Such imagining, dreaming, speculating, and then remaking is a well-known method (although method as it is understood in the mother tongue as a good way, a path, a place of beginning; anything can happen once one is on the way). It is a method to stand against what is authorized – to upset what-is through imagining what seems impossible until brought to words and then action. Its current popularity in education, particularly in educational technology research, speaks to the growing concern that education *itself* must stand against what is authorized, and, too, against technology as used in collusion with the authorized rather than, as once dreamed, as a springboard to otherwise (Bayne & Gallagher, 2021; Houlden & Veletsianos, 2022; Ross, 2017; Selwyn et al., 2020; Suoranta et al., 2022).

To think with Dewey invites a pragmatic orientation to speculation that resists specialization or generalization and asks: “In what respects would the world be different if this alternative or that were true? If I can find nothing that would become different, then the alternative has no sense” (James, 1907/1981, p. 27). And for whom will it be better? In other words, it is a mode for better going on, for *acting* differently to *make* that difference. Without “speculative audacity,” the capacity to imagine otherwise than the already-known in the already-is, it is possible only to “do and do over.” Living itself is thus endangered whenever conditions change – and they are always changing. On the other hand, Dewey (1929a) also reminds us, if our thoughts “terminate in picturesque Utopias or dogmas irrelevant to constructive action” (p. 221), we continue to do over because there is nothing else to be *actually* done. There must be a reciprocal relationship between our specialized results and speculative ideas:

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Specialized results recurrently get too set and rigid because of isolation due to the very specialization by which they are obtained. Fermentation and fructification then come in from the pole of general ideas and points of view. Specific results are shaken up, loosened and placed in new contexts. (Dewey, 1929b, p. 52)

Yet both speculative ideas and specialized results are mere whimsy, shibboleths, or “dead” *unless they are made actual*. This is easily understood in the case of dreaming, but far too often, what is called “realistic” is confused with the “actual.” What at first glance seems eminently practical, usable, doable, *realistic* - packages, programs, strategies, “best practices” – can be as unhinged from the actual as our dreams and, indeed, less fruitful. A dream space is something to hold hands with, lean into, open into, leap toward even if it cannot *yet* be actualized. When something is given as correct, as good, as the way to do things, the way it is, but it does not work or does not fit, feelings of inadequacy or anger or hopelessness are provoked. Whoever cannot go along feels outside of, closed off from, ways that “work.” Moreover, in focussing on what works and trying to fix what (and who) isn’t (because, after all, it “works” for some or even many and that very working points to the inadequacy of those for whom it does not work), whatever is getting in the way of that working, the wrongs that proliferate, remain. In the same way, speculating on futures without understanding the sources of proliferating wrongs merely reproduces them.

Speculative thought, Martin Savransky (2017) reminds us, drawing on James, Dewey, and Whitehead as sources to think with, “constitutes a mode of experimentation whose aim is that of producing suggestions, propositions, or ideas that, by trusting the possible, might offer the necessary guidance to produce a different mode of response to an impending problem” (p. 31). Indeed, he says, “Speculation emerges from the fabric of experience and its primary aim is to

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return to it albeit in a transformed way” (p. 33). Speculation is “sandwiched” by experience. “A speculative proposition,” Savransky (2017) notes, “becomes ‘true’ to the extent that it succeeds in inciting its environment while allowing itself to become infected by it” (p. 36). As such it must be “launched into the developing edge of the present” (p. 37). In the case of this research, it begins enmeshed in experience as a springboard for the speculative invention of a teachers’ science and returns to experience for its experiments. Although the experiments can only be imagined and are therefore fictional, *thought* experiments only, they are not less “real.” Art, as Dewey (1934) argues, *is* experience, but experience at its most intense. Fiction as art, and, too, teaching, which is an art, and speculative research, too, which moves into the space between art and science, invite us into experiences of latent histories and living futures – otherwise unrealized and unrealizable – for richer and more expansive becoming. What is important is that the invention of a new science, a different mode of responding, is verified in *experiences of practice* to judge, in the end, what difference it could make if it were made true.

“This interplay of thought and practice,” Whitehead (1929b) argues, “is the supreme authority” (p. 64).

In essence (and in the mother tongue), this speculation, developed from an audacious idea that love not knowing better is the foundation of education, is the speculative invention of a teachers’ science. It begins in the workshop of experience, drawing from it problems or absences with which to make differently. It is then made, not as a product to be taken down from the shelf and applied but a model for a process, a “mode of moving from place to place... a means of getting about” (Serres, 1995, p. 104), a way for ongoing invention, perpetual beginnings that is a teacher’s science. This research will use thought-experiments as tests of practice – educational

fictions (Selwyn et. al, 2020) that “imagine for real” (Ingold, 2022) what might become from its invention, since the *actual* making and testing might take years (and, indeed, become entirely otherwise than I can imagine here) – or never quite make it to making, thus remaining speculative only. However, even so, once an idea exists, *one that lives in the living*, it can be launched into the actual to become the way it is – like the four-minute mile, a dream only for decades and now a common standard. Or the revivification of Estaban’s village from desert to flourishing gardens. Or the other futures we dream of for our children.

Loving methods

Thinking from the fabric of experience to invent a model for a teachers’ science, as I have said, I believe it must be tethered to love; love must be its wellspring. I had thought we would sit together to think about love after I explained away method, a quick argument to appease requirements before getting on with what matters. However, I am continually re-entangled in method. After all, as William Doll (2012) contends, method now “lies at the heart of our educational enterprise: it shapes our textbooks, our curriculum plans, our ways of teaching, and our ways of teaching teachers how to teach” (p. 81). We teach “methods courses” to teacher candidates and employ learning progressions, developmental sequencing, curriculum mapping, standards, all in pre-set order, as though knowledge is independent of those who teach and those who learn and the places they do so, a simple, sterile process of extraction and implantation. Indeed, the question of method is not only about this research which I have conceded is speculative inquiry – that is, wondering/wandering in the space of not yet where invention can occur – but, too, of the science I am dreaming of so that thinking *otherwise* than with prescribed methods might be possible. Yet I am coming to realize that method *itself* must be understood with love, told with love, remade with love into a loving, and therefore, living method. To argue

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against method, something I have done for years (even now, although less overtly, with my foot-dragging and hesitations) mires me in the framework of do-overs. Unlike love, criticism, Serres (1995) says, is never *fertile*. No newness can come from it.

Indeed, the very idea of method is tied as inextricably to science as form to art; it cannot be summarily dismissed even when rewritten in the mother tongue. In contemplating the invention of the form of free verse, T.S. Eliot (1973) points out:

Only a bad poet could welcome free verse as a liberation from form. It was a revolt against dead form, and a preparation for new form or for the renewal of the old; it was an insistence upon the inner unity which is unique to every poem, against the outer unity which is typical. The poem comes before the form, in the sense that a form grows out of the attempt of somebody to say something. (p. 490).

This research is a (loving) revolt against the “dead, specialized work” (Dewey, LW. 3.10) of sciences in education whose abundant reproduction has, nonetheless, been impotent to effect the changes we dream of for our children. The difficulty is that its method is a way to think, rather than a way for thinking to emerge. Whitehead (1925) identified the “danger inherent in modern science” (p. 200) almost a century ago:

Its methodological procedure is exclusive and intolerant, and rightly so. It fixes attention on a definite group of abstractions, neglects everything else, and elicits every scrap of information and theory which is relevant to what it has retained. This method is triumphant, provided that the abstractions are judicious. But, however triumphant, the triumph is within limits. The neglect of those limits leads to disastrous oversights.... Modern professionalism is the training of minds to conform to the methodology. (p. 200)

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This assertion echoes Dewey's (1929) point that science itself is not the problem, but that in setting itself above others, it exceeds its authority. Of deeper concern is that in making itself an authority over educational matters, and, indeed, overtaking its heart, it reproduces itself rather than renewing; it forecloses on multiplicity; it turns what William James (1907/1981) calls a pluriverse of partial stories that "mutually interlace and interfere at points" (p. 67) into a monastic dogma that tells one.

If, for renewal, love – something for which there is neither evidence nor measure and what is required of it cannot be known in advance (Osberg, 2010) – comes *first*, is the heart source of science, then what methods might come of it? It is important, therefore, to pause to ask first, what is love? Or rather, since we all know love, what can we say about love *here*? When asked to talk about love, Derrida (2007) replied, "I have an empty head on love in general. I either have nothing to say, or I'd just be reciting clichés" (1:12). When prodded further about why philosophers nonetheless always talk about love, he says:

Is love the love of someone or the love of something? Suppose I love someone. Do I love someone for the absolute singularity of who they are? I love you because you are you. Or do I love your qualities, your beauty, your intelligence? Does one love someone, or does one love something about someone? The difference between the who and the what at the heart of love separates the heart. It is often said that love is the movement of the heart. Does my heart move because I love someone who is an absolute singularity or because I love the way that someone is? Often, love starts with some type of seduction. One is attracted because the other is like this or like that. Inversely, love is disappointed and dies when one comes to realize the other person doesn't merit our love. The other person isn't like this or that. So at the death of love, it appears that one stops loving another not

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because of who they are, but because they are such and such. That is to say, the history of love, the heart of love, is divided between the who and the what. (1:54 – 3:32)

Just sitting here together, thinking about our children, but, too, thinking about ourselves and each other, we want to be loved, surely, for the absolute singularity of *who* we are. Looking at our children, sitting with us, whom we so love, we do not want them to be cared about in school only if they can quickly learn their times tables or remember to put up their hand before they answer questions or neatly write a paragraph as prescribed. We do not want them to *improve* but to grow into their singularity in all its richness. Love is *fertile*; it generates multiplicities. And, too, surely, when we think about love and children, we dream that, growing into themselves, our children can contribute their singular gifts to our communal flourishing for this, too, love knows. It moves *toward* others; it grows *with* others. Alone, it dies. There is nothing easy about love and no guarantees. As Octavio Paz (1995) says, “Love does not preserve us from the risks and misfortunes of existence” (p. 262). It is, rather, “a bet, a wild one, placed on freedom. Not my own; the freedom of the Other” (p. 67). Love, in other words, is speculative, a dream for better futures for *others*. So, too, as a practice of love, is education.

The last fine day I took Lily to the beach with me. The tide was out, and we wandered down to look in the tidepools to see the starfish, but when we got there, the tide pools were empty of everything but a few crabs and snails. Starfish, I have since learned, have disappeared almost entirely, melting away in our too-warm sea. I hold her hand. My grief is intolerable. It is hard not to picture an apocalyptic future for her.

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We know, we sitting here at the kitchen table where “our dreams drink coffee with us as they put their arms around our children” (Harjo, 1994, line 6), that the life of progress, knowing better and better, of domination over, to know over and above others – children, teachers, loggers, whole countries, the mauve children yet to come, starfish, trees – is destructive as a way to go on. The evidence is beginning to be *felt* that some of us cannot continue to live well while others (human and other than human) live precariously. Poets, Elders, theologians, mothers, as well as philosophers, these and many others who know other ways of human knowing (and other knowing outside the human), remind us always about the necessity of love to temper our intemperance. W. H. Auden (1940), sitting “uncertain and afraid” (line 3) in “one of the dives/ On Fifty-second Street” (lines 1-2) on September 1, 1939, on the eve of a war that we of the future shudder to remember, reflects that “no one exists alone / .../We must love one another or die” (line 85, 88). This is echoed decades later by Martin Luther King, Jr. (1963/1977) writing from Birmingham jail: “We are caught in an inescapable network of mutuality, tied in a single garment of destiny. Whatever affects one directly, affects all indirectly” (p. 468). And told to us since time immemorial. In the words of the Nuu-cha-nulth people: *Hisukʔis cawaak*. Everything is one.

Our living *depends* on love.

The method of invention is a kind of “free verse” for science that grows out a given problem about which those for whom it is a concern – who *love* and are willing to choose the sacrifice that love demands to *do* something. It resists (*must* resist in order to attend to the absolutely singular) external and imposed control of method that John Dewey (1929a) argues against, because, he says, “common experience is capable of developing *from within itself methods* [emphasis added] which will secure direction for itself and will create inherent

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standards of judgment and value” (p. 38). In its singularity and its fertility, in its source at the intersection of care and action, invention is a method of love. However, while inventiveness does not, cannot, repeat itself, love does not demand the cessation of all other methods or argue against them but rejoices in their abundance. The information produced and solutions proffered by conventional “post mortem methods” (James, 1909a, p. 60), however, must work *with* the living to be loving, rather than serve as an *authority* to improve the living. To do so requires loving ways of exchange, of relationship, of connection, and reciprocity rather than domination, control, and insistence that there is *a* right way or that better knowing (via science and its right methods) will lead us to it. It is only within the space that love makes that educational science can be understood as Dewey outlined it, and as I am struggling, staggering, stuttering to invent. What Dewey suggests is an *alternative* to the sterility of fighting or the stagnation of generalities produced elsewhere but enables, instead, what Serres (1995) calls a symbiotic relationship, generated *where we are* and *with* instead of against each other.

The first time I read William James’ (1907/1981) pragmatism lectures, I put several question marks in the margins of his statement that “new truth is always a go-between, a smoother-over of transition” (p. 31). But I was young and easy then and certain in the way of youth that the new was a *break* from the old which was always “less than.” Now after years of teaching, I realize that I cannot teach students at all unless I can connect it to what they already know and who they already are, and so it is, too, with you and me. What use can we *make* of ideas that make no sense *with* what we have long known? It is in *connection* that we are loving. To argue against is always to stay in the groove of do-overs. Starting from zero is more difficult than a break or razing (in our righteous rages) what is or was, but rather to empty *our own minds* of its contents as much as possible so that we attend anew and receive the new (the revelation)

that our preoccupations and prejudices obscure (Weil, 1977). It is trying to clear away whatever obstructs a wider perspective or covers over the “growing edge” of buried roots (Thurman, 1956, p. 177). It means choosing (rather than accepting or rejecting) ways forward that *multiply* rather than reduce possibility for something better. Yet if a new idea is adopted, in other words, used to make a *difference*, James (1907/1981) argues, “it preserves the older stock of truths with a minimum of modification, stretching them just enough to make them admit the novelty, but conceiving that in ways as familiar as the case leaves possible” (p. 31). It strikes me that this might be a more loving way to understand the ongoing popularization of new ideas for education, as an attempt to stretch itself. Yet as long as it assimilates them within an idea of “knowing better,” the new stock cannot open new space. In classrooms, where these ideas from elsewhere are ongoingly implemented to fix what has been defined elsewhere as necessary to fix without any consideration to what is already known there or the problems that proliferate, teachers are suspicious of the next new thing. After all, and unsurprisingly, the ongoing changes these new ideas trigger seem to change nothing. Nonetheless there is a slow stockpiling. Ideas can lie fallow for years, for a century, like Dewey’s for an educational science, waiting, waiting.

Inheriting from science another way

I want to tell a story of science in another way to consider the older stock of ideas about methods not to dismiss or to quarrel but to inherit them in another way so that the very idea of inventing a science *in symbiosis* with our art becomes possible – to use what is triumphant in science within limits that will allow renewal and multiplicity. Yet to do so, it is important to consider what is necessary to unknow about science – not, of course, how it is practiced by individual scientists or within a given specialism but its commonly told story as an authority over

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education via its better knowing – and into what gaps it might be possible to slip through into thinking otherwise *with* science *and* with love. And with us.

Thus, before jumping forward into invention, I turn to physicist Richard Feynman (1998) to tell us what science is:

What is science?... I do not think we need to be precise – it is not always a good idea to be too precise. Science means, sometimes, a special method of finding things out.

Sometimes it means the body of knowledge arising from the things found out. It may mean the new things you can do when you have found something out, or the actual doing of new things. This last field is usually called technology...as a consequence of science one has the power to do things.... this power to do things carries with it no instructions on how to use it, whether to use it for good or for evil. (p. 4-5)

Neither can science answer the question of good or evil. Science, Feynman says, “can readily tackle the question ‘If I do this what will happen.’ It doesn’t mean, of course, that science will necessarily find the answer, but it has a method to try and see, to accumulate information and so on. However, it cannot answer the question – ‘Do I want this to happen?’” (p. 44).

One of the many things science can tell us is *not* that it does or even *can* know it all, but that the more we know, the more our ignorance grows from it, as neuroscientist Stuart Firestein (2013) puts it, so “if you think of knowledge being this ever-expanding ripple on a pond, the important thing to realize is that our ignorance, the circumference of this knowledge, also grows with knowledge. So knowledge generates ignorance” (7:24). What we do not know is *vast and ever-growing*. Indeed, what we *do* know is no very great thing, as Charles Peirce (1898) reminds us, citing Isaac Newton who compared what we know to “a child’s collection of pebbles gathered upon the beach, - the vast ocean of Being lying there unsounded” (quoted in Peirce,

1898, p. 50) and adds, “not only is our knowledge thus limited in scope, but it is even more important that we should thoroughly realize that the very best of what we, humanly speaking know, [we know] only in an uncertain and inexact way” (p. 51). Indeed, a century and a quarter after Peirce wrote this, new discoveries only magnify his point. We now know that this vast ocean extends not only outward from starry skies to deep below the earth’s crust, but inward, a quantum universe, undiscoverable with Newton’s physics, where “the hardest, solidest, densest rock is really almost entirely empty space, broken only by tiny particles so widely spaced they shouldn't count” (Dawkins, 2005, 4:02). Yet as our horizons widen, and our own limits and insignificance is exposed again and again, as Stuart Kauffman (2016) notes, “we believe to a perhaps astonishing extent that our world is knowable, optimizable, and controllable” (p. 82).

Or perhaps it is not surprising. How else do we go on?

The special methods that science uses to find things out in this vast sea of ever-growing ignorance have been described in Thomas Kuhn’s (1996) seminal text *The Structure of Scientific Revolutions*. In what he calls “normal” science (established or conventional science), “research firmly based upon one or more past scientific achievements, achievements that some particular scientific community acknowledges for a time as supplying the foundation for future practice” (p. 10), scientists must *first* acquire what he calls a paradigm, which is a particular kind of map. (This is the map that I have been expected to acquire and supply here.) Because “nature is too complex and varied to be explored at random, that map is as essential as observation and experiment to science’s continuing development” (p. 109). In acquiring the paradigm, he says, scientists acquire not only a map, but directions for map-making, that is, for further research, which includes the “theory, methods, and standards together, usually in an inextricable mixture” (p. 109) – although not necessarily in the same order. Those who share a paradigm “are

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committed to the same rules and standards for scientific practice” (p. 11). In normal science, one cannot research without first acquiring theory, method and standards of that research, that is, years and years of specialized training, which determines “the legitimacy both of problems and of proposed solutions” (p. 109), what Whitehead (1925) describes as “modern professionalism” (p. 200). The researcher’s task, once the method is chosen (and therefore both theory and standard), is to seek revealing facts. This is data exposed through focused attention as important and *understood through the theory-method-standard*, without which, in the vastness, there are only “*mere facts unrelated and unrelatable to the continuing progress*” of a science (p. 35). In other words, facts themselves, as Dewey (2003) notes, are “only fragmentary, uncompleted meaning...unless they are rounded out into complete ideas” (LW.3.10). Or as John Caputo (1997) puts it, “Theory leads science to generate facts of which it had not the slightest suspicion and which, outside the theory, appear to be of no significance whatever” (p. 215). The success of research is in “increasing the extent of the match between those facts and the paradigm’s predictions, and by further articulation of the paradigm itself” (Kuhn, 1996, p. 24).

To research, then, at least within the story of normal research, is to fill in missing contours or correct those that are not yet accurate on an *existing* map. If we think of a road map of Canada, it can in no way capture the totality of land and certainly cannot prevent storms, washed out roads, or unexpected detours from impeding our journey; however, it can be extraordinarily useful for navigating across the country. Without such a guide our travels would be much slower, much more uncomfortable, and even dangerous. What is more, while maps do not tell the whole story their impacts can be profound; one need only consider the continually corrected maps of the human body to appreciate their life-enhancing, never mind life-*saving* capacities. The danger, as William James (1907/1981) notes, is when we think that any one map

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can tell the whole story of experience, erasing, thereby, diverging, partial, intersecting stories. Even as maps are drawn with ever increasing exactitude and ongoingly corrected now in living time, it is important to keep their limits in view. Whitehead (1929b) writes:

There is a conventional view of experience, never admitted when explicitly challenged, but persistently lurking in the tacit presuppositions. This view conceives conscious experience as a clear-cut knowledge of clear-cut items with clear-cut connections with each other. This is the conception of a trim, tidy, finite experience uniformly illuminated. No notion could be further from the truth. (p. 62)

There is nothing clearcut about living and clearcutting is, indeed, destructive of it.

Even the very concept of a map as a representation of “reality” is an archaic metaphor, now, and a reminder that reinvention is always necessary. However, once researchers take up a paradigm and with it, its theory-method-standards, their aim, Kuhn (1996) argues is not to “invent new theories, and they are often intolerant of those invented by others” (p. 24). Their aim is to articulate the problems determined by the paradigm; they do not *take up* problems and their solutions *must abide* by the methods they choose and conform to the standards defined by it. Indeed, newness is not of interest to normal science, which, as Kuhn (1996) argues, attempts “to force nature into the preformed and relatively inflexible box that the paradigm supplies. No part of the aim of normal science is to call forth new sorts of phenomena; indeed, those that will not fit the box are often not seen at all” (p. 24). The attention of science, therefore, necessarily *resists* the recognition of the unexpected or the incongruous. This narrow vision, Kuhn argues, lends itself to the development of science by the steadfast focus upon a small range of problems in detail and depth. Indeed, it takes, he says, a revolution for anything new to be seen or to notice

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the things that refuse to fit in the box. In other words, what enables its efficiency and effectiveness in problem-solving prevents invention.

Method, therefore, Erin Manning (2013) argues, works as “an apparatus of capture ... it diagnoses, it situates, it organizes, and ultimately it surveys and judges ... Method works as the safeguard against the ineffable: if something cannot be categorized, it cannot be made to account for itself and is cast aside as irrelevant” (p. 32). Its gifts and triumphs come at a *steep* cost.²⁷ A method keeps our heads down, solving the problems it generates; we forget that there are other ways to see the world. Indeed, as our maps become more and more precise, it becomes more difficult to lose our way in order to find other ways (otherwise). Matthew Coon Come tells of his return to the Reserve after years at university. He wanted to go exploring with his father and learn the “old ways.” He had brought with him, from the city, a topographical map of the area, and he tells of his father’s reaction to it: “The first thing my dad did was tear that map into tiny little pieces...He said I was committing the white man’s mistake, making plans for the land without ever setting foot in it, without ever getting the feel for it” (in Came, 1995, p. 16). Now we do not even have to check the land against the markers on our maps but follow the instructions from the thin voice inside our machines telling us the way. So too in classrooms as we follow recipes (methods) and those recipes create recipes that students click through in online modules, learning games, and programs. Children in their absolute singularity, in their ever-newness, cannot be *seen* by method. In taking them up as teachers, we lose our capacity to *feel* our way with the children and with each other.

²⁷ The costs are often given as necessary to maintain control. Attempts to lift or alter those control is a path to “anything goes,” to irresponsibility, to belief in dragons and fairies, to being out of control, to chaos, rather than an attempt to find other ways to move toward truth without imposing it. Anyone who attempts it is lumped with climate deniers and others who *dismiss* evidence and manufacture their own.

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At the edges of any science, however, Firestein (2012) argues, progress is “feeling around in dark rooms, bumping into unidentified things, looking for barely perceptible phantoms” (p. 2). Instead of a steady accumulation of tidy facts and the “mop-up work” (Kuhn, 1996, p. 24) of corrections, “it’s groping and probing and poking, and bumping and bungling, and then a switch is discovered, often by accident, and the light is lit” (p. 2). If what is lit can fit still in the box the paradigm supplies, then the map is adjusted. If things no longer fit, if the anomalies that could be ignored before clamour for attention in the new light, if nature, despite strenuous effort, can no longer be “shoved into the box the paradigm provides” (Kuhn, 1996, pp. 151-152) and if, out of the ensuing crisis, there is a revelation, then revolutionary science begins: “the extraordinary investigations that lead the profession at last to a new set of commitments, a new basis for the practice of science” (p. 6). These investigations *cannot* use the theories, methods and standards of ordinary – normal – science.

Kuhn argues that if a new science develops from these investigations, there is a revolution in the field and a new paradigm is created that does not *add* to the previous map. It is entirely different: he describes the revolution of a changed paradigm as a “conversion experience” (p. 151); once the paradigm is accepted, “what were ducks in the scientist’s world before the revolution are rabbits afterwards” (p. 111). Different paradigms “practice their trades in different worlds” (p. 150). They are incompatible. To think differently demands a “gestalt switch” (p. 204); one does not merely understand the new way by translating it into the familiar language, nor is it merely a question of learning to speak the new language; *one thinks within it*. In other words, choosing a paradigm is a process of segregation. One must then agree to become assimilated into the box its thinking makes. That box is not only segregated from other ways of thinking but is secluded. Indeed, the very seclusion, the insulation from everyday life (children,

sticky fingers, pizza orders), Kuhn says, “permits the individual scientist to concentrate [their] attention upon problems that [they have] good reason to believe [they] will be able to solve” (p. 164). Thus, he adds, rather than constantly rethinking how to go on (there is a map!) or being interrupted by problems that need urgent attention (the untidy and unpredictable vagaries of living), problems for which the scientist has no tools available to solve (in other words, problems for which invention is necessary) can be *ignored*. Attention is given to only those problems that can be solved by its methods; *progress* is made.

However, that progress must be connected to living practice. “Disinterested scientific curiosity is a passion for an ordered intellectual vision of the connection of events,” Whitehead (1929a) notes, “But the goal of such curiosity is the marriage of action to thought” (p. 48). In today’s world, the insularity of “pure” puzzle-solving *for practice* is less and less possible as public interest and access to information as well as private partnerships with industry open science to “the race for competitiveness and profit” (Stengers, 2018, p. 96).

Yet the *success* of science, Kuhn (1996) argues, is in its capacity to find new things out with which one can *do* new things defined by *practice* as better. Without a settled paradigm, when sciences are not yet mature, and this is the case of the social sciences, Kuhn notes, there are “a number of competing and incommensurable solutions” (p. 165) to the problems of their field. Where problems are not solved, however, the question becomes, Kuhn (1995) says – is this even science? Unsurprisingly, then, the battle *between* paradigms and even within them amongst the wide variety of methods shifts energy from problems to proving which explanations are better. Recently, on a math listserv I follow, a new subscriber posted an invitation to an upcoming workshop by researcher Anna Stokke. “Run for cover,” I thought. A barrage of emails ensued. Stokke is a “strong math” researcher – in other words, “back-to-basics” – and many of

the listserv members are followers of discovery math. An entrenched war between the two approaches has people divided into camps, dredging up evidence, and pointing out the errors on the other side. They cannot hear each other, though; they practice their trades in the different worlds that their paradigms make. The children themselves, except as statistical or interpretive proof of this or that, are irrelevant. But science (at least normal science as it has been practiced to date) is not (yet) *interested* in the everyday world where children live.

The failure to solve problems, for example, the “evidence” that children in Canada both fail to do well in math as measured either by their test scores or their pleasure in it, has led to questioning education research that is supposed to make a difference. Of course, in normal science, the very definition of what *is* a problem is generated by the theory-method-standards. Increasingly, the finger has pointed at the newer qualitative methods, invented in opposition to positivist social science which many argued did not account for the social aspect of its science (St. Pierre, 2014a). Yet that they, too, failed to make promised improvements, led to an outcry for “evidence-based research,” that is, normal science based on past achievements with rigorous methods and carefully collected data that reveal solutions to the problems it determines. Thus, qualitative methods, to be approved for funding, for publication, for universities, often need to provide justifications with (incompatible) quantitative concepts “like objectivity, bias, data, coding data, grounded theory, saturation, audit trails, inter-rater reliability, triangulation, and systematicity” (St. Pierre & Jackson, 2014, p. 6).

More recently, researchers are arguing that neither qualitative nor quantitative paradigms are effective maps for social science and, indeed, question map-making as a way to understand the living world, arguing that it has led to the unlivable idea “that problems can be stated, formulated, and solved...all is technologically, or logically or organizationally statable and

solvable” (Kauffman, 2016, p. 20) and connected to it, what Weaver and Snaza (2017) describe as methodocentrism: “the belief that particular, pre-formed methods can guarantee the validity of an intellectual investigation into the world by factoring out the vicissitudes of the observer’s entanglement with the world” (p. 1056). Of course, even the normal sciences know now that this is impossible: the questions we ask determine not only what we see, but, uncannily, can determine what happens. Even without wandering into the realm of spooky action at distance or the role of expectation on behaviour, we know that science cannot *separate itself* from its humanness; its methods are *another* way to explain the vast world. When science forgets its own ignorance to play God, it becomes dismissive of other ways of knowing, such as when my research textbook criticizes the “loose and uncritical manner” of laypeople for “choosing only that evidence that is consistent with their hunches and ignoring that which is counter to them” (Cohen, et. al., 2011, p. 3). In claiming its knowledge as “objective” and “rational,” as Stengers (2023) observes, scientific research consigns the “unscientific” to “the dark realms of anecdotal knowledge, particularistic habits, subjective attachments, irrational beliefs, and impassioned affect” (p. 28).

It is at the points where maps rub against living, describe the living, prescribe for the living, set themselves *above* the living, when our fascination with maps leads us to assume that “the world is static, inert, still, able to be captured, and known—mastered” (St. Pierre, 2023, p. 25), that things fall apart. Maps are only helpful when they are helpful and cannot speak to the vastness outside of their tidy edges. We know that who we are, as Svend Brinkmann (2014) points out, “is not somehow ‘understood’ by researchers with a better ‘theoretical framework’ (or a paradigm) to guide ‘data analysis’ as if they could change this by an act of will and thereby come to live in a different world” (p. 722). What is more, not only are we part of this living

world, but as living, St. Pierre (2021) notes, “the concept of data collection is itself problematic because it points to an ontology that assumes data are separate from human beings and so can be ‘collected’” (p. 6.). It is problematic in the nonhuman world, too, of course, but certainly, just sitting here at the kitchen table, thinking loosely, uncritically, we know that even though someone now, as Long and Siemens (2011) point out, can collect the data from our “every click, every Tweet or Facebook status update, every social interaction and every page read online” (p. 32), the very abundance of data does not make it “stunningly obvious” (p. 31) that the data should, therefore, be the basis for decision-making in education or that those decisions will be *better*.

We do know two things. In our vast and ever-growing ignorance, we cannot know for certain. As Whitehead (1929a) points out, “The field of acquirement is large, and the individual so fleeting and so fragmentary: classical scholars, scientists, headmasters are alike ignoramuses” (p. 47). To believe somehow that one has complete knowledge is to “remain unconscious of ignorance” (p. 47). For this reason, he says, “no course of study can claim any position of ideal completeness” (p. 47). Connected to this, we also know, too, no matter how much data it is taken from us, or how carefully all our positions are described, who we are cannot be known completely. Not you. Not me. Not our children. As philosopher and theologian Howard Thurman (1961) writes, “A person’s fact includes more than [their] plight, predicament, or need at a particular moment. It is something total which must include awareness of the person’s potential. This, too, is a part of a person’s fact” (p. 14).

For this reason, St. Pierre (2014) calls into question not only positivist approaches and their data-driven excesses, but the idea that qualitative studies can interpret “truth” from the stories people tell, capturing from them something “stable” as a “finding.” It makes as little sense

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as our data collections, she argues: “Aren’t we constantly reinterpreting our lived experiences as we tell them to different people throughout our lives? And don’t all those re-tellings change us as well?” (p. 6). This is no surprise to those of us sitting together here. Indeed, any story, my story, for example, is not an expression of proof but for transformation; it does not close the case but opens into otherwise.

Of course, science itself only offers certainty from within its own paradigm and by secluding itself from the vicissitudes, that is, from what is living, but those beliefs, confirmed by science’s “success,” have led to the scientism that Dewey referred to and that has blossomed in the hundred years since.

Yet how *else* do we go on? How can we inherit the story of science and its methods otherwise?

Science in symbiosis with living art

Although Kuhn describes the evolution of normal science, he is not *prescribing* its evolution. Indeed, he finds the great passion aroused and energy invested in deciding whether something is or is not a science puzzling. He suggests that the question is not about the definition of science but about a sense of progress. If there is a feeling of stagnation in a field, it raises the cry, “Why does my field fail to move ahead in the way that, say, physics does? What changes in technique or method or ideology would enable it to do so?” (p. 160). For example, as my story reveals, why, after a century of effort in research and its implementation in practice, is there so little progress in the central problem of inequity in education? Kuhn suggests that the answer to these questions will not come from becoming *like* another science as defined by *its* practice: “if precedent from the natural sciences serves, they will cease to be a source of concern not when a definition is found, but when the groups that now doubt their own status achieve consensus about

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their past and present accomplishments” (p. 161). In other words, in education, where ongoing quarrels between research methods continue, we do not have to agree *in the first place* about whether or how our research *is* scientific, but about what *education* is and what matters to it. As Virginia Woolf notes, it is necessary to think of the thing itself that is of concern. Thus, to invent a teachers’ science, a (loving) revolution in educational sciences, a science of our own to support the development of teaching’s beautiful art, we cannot take up a method of the already-thought (or, indeed, quarrel with it), nor begin with an already prescribed definition of science, but thinking about teaching, about children, about education, decide for ourselves what we agree on as the foundation for our science, the problems we want it to solve, the methods for so doing and how its solutions can be measured. In other words, the practice itself defines what is worthy or not. Above all, therefore, to love the absolute singularity of children, teachers, families, each other, to welcome an ever-widening circle of all those who think with us in our “network of mutuality” (King, 1963/1977, p. 468), this science cannot just be a “new” box of the already thought that we are assimilated into.

This is where my research steps into speculation. Kuhn (1996) notes that,

Once a first paradigm through which to view nature has been found, there is no such thing as research in the absence of any paradigm. To reject one paradigm without simultaneously substituting another is to reject science itself. That act reflects not on the paradigm but on the [person]. Inevitably [they] will be seen by [their] colleagues as “the carpenter who blames [their] tools.” (p. 79)

My efforts of invention are to move beyond the fruitlessness of rejection and blame. However, to do so demands generating a speculative idea that, Kuhn says, “may disclose the road to a new paradigm” (p. 87). Without speculation, that is, thinking outside given paradigms, nothing new

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can be generated. Newness, alone, however, is exclusive, too; it forms a closed circle and one that, since it is disconnected from experience and familiar paths of action, more often than not remains speculative only. Freedom from the capture of methods is important for freedom of thought: necessary to it is “doubting, inquiring, suspense, creating and cultivating of tentative hypotheses, trials or experimentings that are unguaranteed and that involve risks of waste, loss, and error” (Dewey, 1929a, p. 222). However, as Dewey (1929b) points out in thinking about methods with children and for teachers – and it can surely be extended to our science – “The fact still remains that an increased measure of freedom of outer movement is a means, not an end” (p. 62). What is important is what can be made *with* the freedom that could not be made without it.

The experimental freedom in Dewey’s idea for an educational science exists in wedding it with our art while at the same time limiting its authority; it offers a way *out* of quarrels, incompatibilities and do-overs and turns toward beautiful teaching as a way *forward*, for a symbiosis between our many maps and the living world.

What drew me to Dewey in the first place is his firm belief that education is a work of art and teachers artists of it, a belief I, too, hold dear, a belief that dreams of singing. Dewey (2003) states explicitly that teaching is an art:

We should get on more rapidly if we realized that, if education is going to live up to its profession, it must be seen as a work of art which requires the same qualities of personal enthusiasm and imagination as are required by the musician, painter or artist. Each one of these artists needs a technique which is more or less mechanical, but in the degree to which [they] lose [their] personal vision to become subordinate to the more formal rules of the technique [they] fall below the level and grade of the artist. [They] become reduced

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again to the level of the artisan who follows the blue prints, drawings, and plans that are made by other people. (LW.15.186-87)

However, without the *development* of this art, stagnation is inevitable. As already noted, he was concerned not only with the reliance on science for recipes but a worship of science that encouraged and even *required* a reliance on it such that its answers were taken as “right” or “good.” Yet he also saw science’s methods of experimentation and systemic organization as a way *out* of the stagnation that the reliance on it has dug. In considering an educational science, then, he (1929b) asks first, “Can there be a science of education? Are the procedures and aims of education such that it is possible to reduce them to anything properly called a science?” (p. 7). He ultimately decides that the word “science” has a wide range and with some latitude, “sufficient looseness” (p. 8), and “flexible room” (p. 46); an educational science could be created. This roominess makes room for thinking otherwise.

Although Dewey refers to developing an educational science, the proliferation, since he proposed the idea, of sciences named “educational” or “of education” precludes the use of it now for the invention of the kind of science Dewey imagined and that I want to take up now. To avoid confusion, I have chosen to use “teachers’ science” to direct attention to what Dewey calls *actual* education, the thing itself; he says, “whatever there is in the way of actual teaching and learning, is done in the classroom, through vital contact, intellectual and moral, between teacher and student” (LW.15.182). Although teaching only takes place in relationship *with* the student and teaching and learning are, as Dewey (1910) notes, “correlative and corresponding processes” (p. 29), the teacher nonetheless is *responsible* for leading those processes and, too, must lead in this science of our own, which serves the development of our art.

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In considering how our own science can support rather than thwart art's development, Dewey (1929b) points out that just because something is *scientific*, it is not therefore *educational*. Any research that starts in a theoretical framework *outside* actual education is not itself educational. When a finding from sociology or psychology or philosophy or any other field is reduced to "to a rule which is to be uniformly adopted, then, only, is there a result which is objectionable and destructive of the free play of education as an art" (p. 14). In other words, he has *no quarrel* with the evidence from a wide range of sciences; he only argues that they cannot be applied to education simply *because* they are scientific findings:

To suppose that scientific findings decide the value of educational undertakings is to reverse the real case. Actual activities in educating test the worth of the results of scientific results. They may be scientific in some other field, but not in education *until they serve educational purposes, and whether they really serve or not can be found out only in practice* [emphasis added]. The latter comes first and last; it is the beginning and the close: the beginning, because it sets the problems which alone give to investigations educational point and quality; the close, because practice alone can test, verify, modify and develop the conclusions of these investigations. The position of scientific conclusions is intermediate and auxiliary (pp. 33-34).

This is a staggering reorientation. The problems of a teachers' science would neither be determined nor solved by the scientific findings developed *outside* of the classroom nor legitimized by them. *Teachers* would decide the problem and evaluate the solution proposed by our science. This is not a rejection of science but a limitation, so it is no longer authorized to *disqualify* the art it serves (Stengers, 2019a). It provides a constraint, rather than methodological containment of our science; there is roominess in it to welcome all ideas, since education can

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never be one thing, as Dewey (2003) says, “until society and hence schools have reached a dead monotonous uniformity of practice and aim” (LW.3.260). Thus, in our science, teachers are not *against* the specialization and special methods of others; a “more conscious cooperation” (LW.17.450) guides our work. Indeed, when you think about it, you and I have already been experimenting with just this method as we sit together at the kitchen table.

The method of our science, however, which is roomy enough to welcome other methods, and to invite their thinking about the problems our art poses, is *inventive*. It cannot take up a method outside of education itself and other methods are only materials for its making. After all, in a classroom at the vital point of contact between student and teacher, invention is always necessary. The method of teaching is best described by Leo Tolstoy (1904):

The best teacher will be [the one] who has at [their] tongue's end the explanation of what it is that is bothering the pupil. These explanations give the teacher the knowledge of the greatest possible number of methods, the ability of inventing new methods, and, above all, not a blind adherence to one method, but the conviction that all methods are one-sided, and that the best method would be the one which would answer best to all the possible difficulties incurred by a pupil, that is, not a method, but an art and talent. (p. 58)

In other words, the method of our science welcomes many methods, but any method that claims to be *the* method for education is not educational. With each student each day in every moment, even, a teacher starts again at zero. With a science of our own, one ready to think *with* us on matters of concern, that invention can move within a constellation of (so far) verified facts.

“Authentic epistemology,” Serres (1995) argues, “is the art of inventing, the springboard for passing from the old to the new - which is education” (p. 14). This research, then, is an invention that enables invention in schools through the invention of a science for its art. In its

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reorientation and roominess, it allows, as Dewey (1929b) notes, a “vital connection” (p. 43) and a “current flowing” (p. 44) between sciences as *a source* (but not authority) for the development of art, widening its scope, enabling its flexibility; and art as a source of living refreshment and connection for sciences’ revisions and renewal. They thus “reciprocally confirm and illuminate one another” (p. 22). It allows for practice itself, in the experience of its becoming, as Dewey (1929a) says, to develop “from within itself methods which will secure direction for itself and will create inherent standards of judgment and value” (p. 38) and to stem the “flight from experience” (p. 38), which, he argues, not only wastes time and energy but fosters disillusionment and cynicism. Disillusionment, today, is reaching despair as dire authorized predictions for apocalyptic futures with only technical remedies foreclose on the hope that you and I, just dreaming together, can imagine and therefore make otherwise.

The living current releases sciences, too, from methodical confinement. Indeed, as Firestein (2012) argues the *exhilaration* of science, its *singing*, science in *love*, is not in giving and receiving information, the specialized training from the 1414-page textbook, weighing 7.7 pounds from which he lectures on neuroscience, but in the mysteries yet to be unfolded. This is science *learning*; it is science *inventing*. The textbook is *a source* for its ongoing invention. Education, Dewey (1929b) says, is *wider* than science. It *grows* science; it cannot be restricted within its narrower confines, which, thereby, restricts science. Invention *is* an educational method: what is educational grows, explores, invents, plays, wonders, multiplies, widens, enriches. It does not follow along but is *how we go on*.

Making room for the new

In this research that invents a teachers’ science, then, thinking with Dewey and others, with a century more of efforts and ideas for education, I imagine, always, beautiful teaching that

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sings, opens, expands, exhilarates, that loves, and our children, taking from it, with it, a desire to invent better living. I imagine a looser, more roomy science that *invites* rather than argues, that loves *with* us to support beautiful teaching, that is welcomed past all closed doors because it has come to *help*, not correct, to offer, not to advise, not to showcase and “show how” *but to learn with*. I imagine a science that will not order teachers, but will order things for us, lighten our load, take up the housekeeping and administrative chores, organize the overflowing cupboards of research, and *clear space* for the consequential and generative work of our art.

The idea, like all new things, is wobbly yet, its features blurry; perhaps its shape will only ever be a gesture, an ongoing invitation for making (Amsler, 2019), and certainly not a blueprint or prescription to follow with fidelity. But if we believe that something better, something more beautiful for our children is possible, then we need to take a chance on dreams and nourish new ideas, even if it is not yet certain that they will grow into anything worth keeping. What is already known must be a springboard rather than a confinement and thus allow and facilitate a leap into the new.

There are many things yet needed to bring shape and substance (whatever shape and substance might come to mean) to the invention of a model for a teachers' science, to create, somehow, a living process that is large enough for love.

A short list: expanding on the idea of love as it connects with the educational and how it might fructify both our science and our art and fecundate their interactions; considerations of how a more conscious communication might be effected, how we can move toward sitting across from each other rather than above and below each other; methods for the messiness that is inevitable when multiplicity and inventiveness take lead; ways to organize *for* inventiveness; and the role of beauty as a living measure of education as a work of art, and which Serres says,

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“saves as much as science does; it is as objective as science” (p. 184). Our science, although new, cannot be revolutionary in the sense that Kuhn describes, overthrowing, converting, and creating a new box within which to think.

However, other revolutions, like other sciences, are possible. Adrienne Rich (1993) writes:

A revolutionary poem will not tell you who or when to kill, what and when to burn, or even how to theorize. It reminds you (for you have known, somehow, all along, and maybe lost track) where and when and how you are living and might live—it is a wick of desire. (p. 241).

Desire, Eve Tuck (2010) says, “accumulates wisdom, picking up flashes of self-understanding and world-understanding along the way of a life” (p. 645). This is the kind of revolution love makes – and education.

When an idea of the idea of our science is sketched out (chapter four), something flexible and roomy to grow with and for the living current of practice, enough of a starting place at least, it will be possible to test it through thought experiments (chapter five), which, again, are not proof and do not provide proof. A thought experiment, Thomas Kuhn (1978) says, “can teach nothing that was not known before. Or, rather, it can teach nothing about the world. Instead, it teaches the scientist about [their] mental apparatus” (p. 242). In the case of *social* science, which exists between the “actual and our aspiration for something which is better but non-existent” (Dewey, 1929a, p. 220), an uneasy and ever-shifting marrying of irreconcilable things, thought experiments take the form of social science fiction (Selwyn et al. 2020). Their *purpose*, however, is to make the revelation that precedes the revolution possible. As Kuhn points out, “scientists do not see something as something else; instead, they simply see it” (p. 85).

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For the thought experiments, here, I will return to the experiences of classrooms I have told, in Lily's, in those of prospective teachers, or rummaging back to concerns from my own classrooms that are axe wounds still: Paul's unfounded faith, Cody's anger, Marina's indifference – to, as Martin Savransky (2021) suggests, speculatively experiment with the problems there, “not in order to find their ‘true’ solution, but to enable them to enable us to impregnate the world with new difference” (p. 156). I want to tell the stories in another way, to sift through them for the miracles that love makes. After all, what else is a revelation but a miracle: the seeing of what is so unexpected that we see anew? Once seen, as I have seen miracles, it becomes impossible to continue as before.

Then, from new constellations made available through seeing otherwise, the concern of distance education can be considered and the questions it raises as it becomes (has become) not merely a specialization but the way of schools. After all, even the in-person classrooms of our smallest children include digital programs, video experiences and online play. Boundaries have blurred. It might be possible to see how online experiences (from wherever they take place) and the tools of technology that afford them can be used not merely to recreate the old environment but to take up new and not yet imagined opportunities to better serve our art. We might begin to reinvent with distance education, not as something that makes no discernable difference but as making the difference we have been longing for.

In the end, returning from memories and the other futures they lean toward, yearn for, from the possibilities of otherwise that other thinking makes, you and I, brushing off the dust of our imaginings and gathering up our briefcases, our agendas, our sensible shoes, our raincoats if we leave the glow of our screens for work, or staying, just combing our hair and pulling down the blind so the harsh light from the window doesn't limn our face in shadows, look about us in

the actual world again, noticing our quarrels and frustrations still there, the dog, the dirty sink, the unmade bed. And yet *here*, wherever here is, in the “parts of the world to which we are closest, the parts of which our knowledge is the most intimate and complete” (James, 1907/1981, p. 29), in the growing places, in the workshop of our being, in the place beginning to lead everywhere, we might make the leap into other futures.

Concerning ethics, standards & verification

Still, questions remain. For example, is this research ethical? Certainly, as Richard Sandford (2019) argues, speculation as research *is* an ethical stance toward future inhabitants of the earth. Yet there is no informed consent form for the invented, fabulated, speculative; nor can I offer any guarantee, for example, that my idea will not produce negative outcomes. If, however, it is accepted, and surely every day *proves* it, that there *are* no guarantees in living, for living, that chance always looms over even best laid plans and the future, no matter how hard any of us peer into its murky mists is always obscured, then what is ethical is at best a promise only. Indeed, if the purpose of ethics is not a legal obligation but a loving one, and therefore inventive, as John Caputo (2000) argues, that is, to be ethical is “to maximize and optimize the possibilities of human flourishing and minimize violence, by allowing for the invention of new forms and the coming of things we have not foreseen” (p. 10), then the very effort of this research *is* ethical. Lather and St. Pierre (2013), who question and, indeed, refuse method, argue that “the ethical charge of our work as inquirers is surely to question our attachments that keep us from thinking and living differently” (p. 631). It also demands that researchers *are* attached to and affected by, infected with, the matters of concern for their research (Doucet, Debaise, & Zitouni, 2018). To take up an accepted way of doing things, despite my deep and abiding concern that it is harmful for children merely so that my work is accepted is unacceptable. To have spent decades in

reading, thinking, experimentation and effort and to say - this is not loving! - but to go on anyway is iniquitous. To be in a position of *influence*, in the turning place, the *growing* places of possibility, and to turn away is unthinkable. Indeed, to invent carries with it a deeper obligation, a more radical responsibility, far beyond what could ever be reduced to or obviated by a form or any kind of guarantee.

A further question arises: how can I *prove* that this research, given that it is a speculative invention only, an idea not an artifact, tested fictionally rather than in the “real” world, is worthy of approval within the known parameters of current scientific research and additionally, because it is dissertation research, within the further restrictions of our current understanding of education, even though it attempts to move beyond them both toward something new. Certainly, as St. Pierre (2019) says, “the typical markers of goodness, adequacy, validity, objectivity, and replicability used to judge conventional social science research are not appropriate because those judgments impede the experimentation and creativity required for the new” (p. 10). At present, *conventional research informs the way we “do” school*: data from students, teachers, schools, districts, countries, global trends are extracted, measured, and analysed as evidence from which definitions of success can be derived and performance outcomes developed so that “what works” for that success can be judged. Thus, teachers and students are accountable to measures *outside the experiences they engage in together* and are under no obligation to think in excess of the already-known that research makes available (what is not yet – our dreams and desires – is always in excess of what is). Nor are researchers expected to think in excess. Indeed, they are penalized for doing so. The researcher’s title to academic advancement, in my case, to gain a doctorate, as William James (1899) puts it, is in “[their] ability thus to show [themselves] an efficient instrument of research” (p. 32), their capacity to “grind out ... some little pepper-corn

of new truth worthy of being added to the store of extant human information on that subject” (p. 32). Yet even preschoolers now understand that to verify what is already known, one need only look it up or ask Siri, Alexis, or ChatGPT (and the proliferating identities of generative AI). What remains difficult, even with all our advances, are unanswerable questions that living always generates, as William James (1909a) puts it, not the surfaces that our knowledge can extract and examine but the thickness of reality that it cannot fathom: “its insufficiency here is essential and permanent, not temporary” (p. 57). A focus on what is known can produce abundant ends but the promise of new beginnings, which, because they are in excess of the known, overflow with uncertainties, are reduced (Ingold, 2022).

We do, and do over and over again.

Yet if the *promise* of education is thereby reduced, is such research ethical?

For research engaged in opening space for that promise, different modes of verification are necessary. To prove in the not yet, one need only (*can* only) prove that *possibility* exists, that is, in *telling otherwise*. What is more, in the case of research that invents otherwise, the invention cannot be judged by usefulness – that is, that it work for what we already think research ought to work for. As Brian Massumi (2002a) points out,

A true invention is an object that precedes its utility. An invention is something for which a use must be created.... An invention is an in situ plumbing of potential rather than an extrapolation of disengaged possibility...Invention is a plug-in to the impossible. It is only by plumbing that connection that anything truly new can arise. (p. 105)

It is possible to ask, however, and this is the purpose of speculative work, if that telling/inventing offers something of *worth*, that it allows, for example, the courage “to make a

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choice as to the kind of world we want to live in and...struggle to bring it into existence” (Dewey, 2003, LW.17.476). To accept such verification, however, it is necessary to understand education itself differently, not as *preparation* for life (to efficiently teach students what that they are supposed to know to succeed and then to monitor and reward that preparation) but as “a process of living” (Dewey, 2003, EW.5.87) that enables students *to create* the future not one day but ongoingly, so that “the potentialities of the present” are not “sacrificed to a suppositious future” (Dewey, 1938, p. 49), so that education is not understood as a kind of holding space where our dreams are deferred to a “one day” of our “real life.” (And who knows, in the meantime, what happens to those deferred dreams as Langston Hughes [2002] wonders: do they dry up, fester, stink, crust over, sag – or explode?) They are *living dreams* that are made in their very making.

As we, all of us at this fabulated table, are making here.

Still, one might yet ask what standard for its research education *itself* could provide? What test, not one derived from other sciences, but of education which is – and surely this is significant – a work of *art*? Some safeguard is surely necessary, some way to ensure that once invented, and tested (or tried) through thought experiment, *is* better or, at least, can lead to something better? After all, as I have said all along, teaching is consequential work. Those who are responsible for those consequences cannot simply take up ideas or accept ideas on the inventor’s say-so, along with their invented “proof,” as if “anything goes” – and as teachers (those who approve the worth of student work, this dissertation, for example), we cannot (can we?) accept whatever students submit to us. Do we not need to know that they know what they are *supposed* to know? Or if not that, then what else? Are not some measures necessary? Is there

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somewhere fruitful between a shrug (which, in its relinquishing of responsibilities, is at the farthest pole from loving) and the technical verification (which, because it is mechanical, is at the farthest pole from living)? Certainly, these are questions that a model for a new science must yet consider.

But for now, so far, I can say, even before its making, for a teachers' science, which is an attempt to marry education research to the practice of teaching itself, so that the two are intimately linked, Dewey (1929b) describes a double-verification process as safeguard. Any strategies, processes, programs, and next ideas are tested and verified *in practice* by practice itself. However, the sources for possible solutions are sciences with their own methods for verification. Indeed, Dewey argues that the development of an educational science is only possible when the sciences that are its source develop. Moreover, he says, we must only draw from their established materials, not their "latest research" which is best understood as contributing to the growth of the science itself as it gropes in the dark room of its next thinking. In this way, he argues, we "militate against exploitation of results that are as yet only half baked" (p. 41) and protect our schools – our *children* – from attempts "to extract from psychology and sociology definite solutions which is beyond their present power to give" (p. 42) – or, too, with our latest technologies. Just because a new technology has been developed does not mean it ought to be immediately applied in *education*. A teachers' science, sourcing many sciences, selects potential resources not only from the most substantiated evidence, but, too, research that is confirmed through linkages with other evidence in a wide variety of fields, not least the capacious and growing material from practice-led and experience-based research and outside science, too, in other knowledges and practices that sit with us in concern.

Yet whatever solutions proposed by even the most mature science or the most promising research from practice are only verified for the classroom where *actual education* takes place by the particular practice in its particular place for the particular problem it poses, none of which has existed in the same way before and therefore no solution can merely be applied. The verification Dewey describes is akin to Laurel Richardson's (2000) notion of validation through crystallizing rather than triangulating (a common strategy in conventional research which assumes that there is a "real" point that can be triangulated): "The central imaginary is the crystal, which combines symmetry and substance with an infinite variety of shapes, substances, transmutations, multidimensionalities, and angles of approach" (p. 934). At the same time, while thus opening to many knowledges, the additional living verification of a teacher's science allows for the as yet unimagined and the "suddenly possible" (Atkinson, 2022). Even the best of best practices and the most rigorously tested information is only, as James (1909b) argues, discarnate truth, "static, impotent, and relatively spectral, full truth being the truth that energizes and does battle" (p. 204).

Moreover, the standard of verification in practice is *educational*. That is, the solution is not tested against the problem as understood by science. Merely saying that something "works," for example, to instill kindness, and measuring it by what can be measured, let us say, to return to the earlier example of praising children for kind acts, by counting examples of kindness carefully defined, is insufficient. Education, Dewey (1938) says, "has a long look ahead, and views every present experience as a moving force in influencing what future experiences will be" (p. 87). It looks up and looks widely. But it cannot guarantee. Guarantees come at too steep a cost for the living. As researcher Maggie MacLure (2006) warns, "As long as research continues to work for, or collapse into, resolution, reconciliation, mastery or innocence, it colludes with the

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closure-seeking appetites of bureaucratic reason, with its punitive mission of transparency, standardization and certainty” (p. 741). Bureaucracy cannot lead: “All the rest of the systems, organization and administration,” as Dewey (2003) argues, “is really so much superstructure for enabling the classroom teacher to do his or her work” (LW.15, 182). In our *living art*, we must move by feel, *enabled* but not authorized by that superstructure – nor limited by its markers of value.

In the end, this research that invents in the field of living will *not* offer a pepper-corn of new truth or a nugget of gold to take away; the making it makes cannot be prescribed. I dream only that it will offer a moving force, opening new questions, new gaps, a revelation, even, or, perhaps, getting to the end, we, sitting still at the kitchen table together after the stories are told, might say, well, this is not quite it, but there are some parts that others might make a difference with, that we might *hope* from. There can be no *proof* for any of it, for anything that moves into the living and dreaming space of the not-yet and the very attempts to restrict living (and dreaming) to the predictable (despite all the vicissitudes that cannot be predicted) by demanding verification, if verification means proof *from what already exists*, restricts invention and, therefore, renewal.

One last thing. Is it possible to ask, at least, if this research is *true* (even if it is fiction)? Truth, William James (1907/1981) argues, is “bound up with the way in which one moment in our experience may lead us towards other moments which it will be worthwhile to have been led” (p. 93-94). As such then, it is *made*, he says, “just as health, wealth, and strength are made, in the course of experience” (p 98). So, too, education, or perhaps more accurately, education *is* truth in making, an ongoing process, *making* the dreams we put around the arms of our children.

If so, then this research is true.

Last spring my students, who were embedded in a school and I, teaching my course there, with them, organized an event for Earth Day and invited a Quw'utsun Elder to speak. He was a small man, neatly dressed, with a white cane to assist him as he walked to the middle of the stage. All the children gathered in the gym wearing blue t-shirts especially designed for the occasion. They sat on the floor, three hundred of them, as the Elder stood to speak, telling them about his childhood, about walking down to the beach overflowing with abundance. As he described the starfish, anemone, clams, oysters, mussels, birds' eggs, fishes, the children, like the sea itself, bright blue, began to wave. Teachers, great birds on the sidelines, swooped in, settling the waves, worrying that soon they would spill over, that he was talking far too long for such little children. He cannot *see* them, they thought. But he talked and talked, talked to the limit that no one knew was possible for them, *feeling* their energy and just as the sea of children was alive with more and more waves, he took out his drum and in a language none of them knew, set his story into their souls and a great calm spread across them.

He did not expect us to speak his language or, indeed, ask anything of us; his story was only a wick of desire; it seeded possibility, enlarged horizons, multiplied ideas, and sitting here, thinking about it again with you now, I begin to see another way to respond beyond grief and rage. This faith that we *can* feel the land, the sea, each other, that we can look up, up from our maps and quarrels and trust each other enough that we hold hands and leap into the gaps our dreams make.

This research invents nothing that can be weighed and measured *outside* of the experience itself. It is the invention of a living path for education as a living process that *moves*

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as it learns and loves. It offers no sign with clear directions posted ahead that we can progress to with all speed and expediency, only ways (so far) to read together what is learned as we go, the rough edge there, the greenness here, and in being moved to move, feeling our way and following longing, *desire*, we “accumulates wisdom...along the way of a life” (Tuck, 2010, p. 645). And its palimpsest, glinting in the sun, is beautiful.

Inventiveness *makes* the paths.

I do not know if – and certainly cannot guarantee that – I can make something here that will make a difference; I only know that it is *of worth* to try and try again.

William James (1907/1981) contends that our dreams are “live possibilities, for we are their live champions and pledges” (p. 128) and they are made *actual* by our *act* which, thereby, can “create the world’s salvation so far as it makes room for itself, so far as it leaps into the gap” our dreams make (p. 129).

I dream here on the chance, a speculation, that in making room for what is not yet, it can become actual and *move* us.

Thus (again), for this research *and* the science it invents, there is no possibility for the kind of verification that a boxed science can provide, but here at the kitchen table, we know and have always known something about *living* verification. We sit here, not because we have answers, but because we do not; not because we are certain or expect to be certain, but knowing certainly that we cannot be; we gather, not in expectation of getting things *right* in the telling, but to celebrate in gratitude for the possibilities that birth, growth, joy, love reveal to us or to heal from wrong turns, all the errors and remorse, our sorrow and pain; we *make* ourselves whole here, trusting each other, with each other. There are no recipes for stories of celebration and healing; they cannot be repeated. But when we hear them, we feel them and say yes.

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Leonard Cohen, in answer to a question about his song Hallelujah (on an album that was rejected as unworthy) which includes the line, “Your faith was strong, but you needed proof” (1993, p. 347) says,

This world is full of conflicts and full of things that cannot be reconciled but there are moments when we can transcend ... and reconcile and embrace the whole mess and that's what I mean by Hallelujah. That regardless of what the impossibility of the situation is, there is a moment when you open your mouth and you throw open your arms and you embrace the thing and you just say 'Hallelujah! Blessed is the name.' And you can't reconcile it in any other way except in that position of total surrender, total affirmation ... in this moment when you embrace it all and you say 'Look, I don't understand a fucking thing at all - Hallelujah! That's the only moment that we live here fully as human beings.

(in McKenna, 1988)

Perhaps this is the only test possible for an invented science developed on “the wings of imagination” (Dewey, LW. 3.11) for a living art – that at the end, we who sit together can say “Hallelujah!”

A revelation.

To become educated is to move at the growing edge of living where there are no right answers, but we are not saved by narrowing the path and limiting its scope to reduce our errors or by assiduous correction, dooming ourselves to do-overs, but through the surrender that is affirmation: we look up from *where we are* to create paths we can walk *together*.

We are not alone.

I reach for your hand. You say, I am here.

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This is the miracle we have longed for always. This is the dream we put around the arms of our children.

This is *how we go on* and what we teach our children, along with the reading, writing and arithmetic that are never the *purpose* of education, but *sources* from which they might go on more fruitfully. It is the going on that holds all the possibility; we say to our children, yes, you *can* go on and the going on sings.

Chapter 4: Inventing for Inventing – A New Model

Last night as I was sleeping,
I dreamt—blessed illusion!—
that I had a beehive
here inside my heart.
And the golden bees
were making white combs
and sweet honey
from my old failures.

--Antonio Machado

Chapter 4 Gloss

In this chapter, the narrator imagines a science love would make. Drawing on John Dewey's speculations on an educational science and Thomas Kuhn's analysis of how new sciences emerge she creates a model for a teachers' science. She begins by considering the constraints of love that therefore constrain the invention. She then develops three ideas of educational love that provide the foundational responsibilities upon which the science will be built. From them, she outlines methods as living (loving) processes as well as the organization that love makes to make loving methods possible. Finally, she considers the measures of love since all too often evaluation is the stumbling block against which dreams of just and equitable (loving) education fall.

Not Yet: Speculation, Invention, & Other Futures

I asked my mother, the other day, about Mrs. Swaffield, the teacher in that very remote logging camp of my childhood. What must it have been like, I wonder now, a question that never crossed my mind then, to be so very alone and cut off from any support or even simple collegiality. My mother does not remember. But she does remember tipping the garbage into the sea at the dumping ground created by the logging company. The logging camp has long since disappeared; its houses barged to a new location after the accessible timber had been harvested. Disappeared, too, some time before the camp's disappearance, is the seasonal village of the shíshálh Nation.²⁸ The deep protected bay and nearby supply of fresh water and salmon-bearing rivers made it favourable, not only for the later arrival of a logging company, but for early settlers who brought with them missionaries bent on "improving" the lives of those who had lived there since time immemorial. They brought smallpox with them, too, and soon the village was abandoned, the few surviving members moving to join another band in Sechelt, where their children attended residential school. With the arrival of the logging company, whatever remained of their village was razed (McMillan, 2013; Merchant, 2020).

From the future, it is easy to see how difficult it is to speculate, how what seems good and true can turn to evil, how making an "honest living" can become a future source of profound pain, destruction and even extinction. Indeed, as Dewey (1929a) argues,

Everything that [a human] achieves and possesses is got by actions that may involve [them] in other and obnoxious consequences in addition to those wanted and enjoyed....While unknown consequences flowing from the past dog the present, the future is even more unknown and perilous; the present by that fact is ominous. (p. 43)

²⁸ The capitalization protocol is determined by the shíshálh Nation and overrides APA guidelines.

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Yet it is in the ominous present that we must speculate on the unknown future in order to teach our children to thrive there. Our past is a stark warning that such speculations to determine our actions are consequential and, therefore, must be made with care, attention, love, and humility rather than from an assumption that what we know *now* is sufficient or true. At the same time, this uncertainty opens space for dreams, hope, and renewal, too, which, surely, are just as possible through our actions today. “To the being fully alive,” Dewey (1934) says, “the future is not ominous but a promise” (p. 17).

It is from this space that does not yet exist, the gap between now and then, that education offers the possibility – a promise – of something better, even – or especially – for those whose present life is the most oppressed and bleak and for whom education has as yet reneged on its promise. Indeed, education *is* speculative - a *promise* - and is ongoingly renewed *through* speculation. The speculative work of education is not only work of far-reaching consequences, but of *first* consequence. As Janusz Korczak says, “Without the child, all our work would have no purpose To whom would we hand over the steering wheel and the oars, so [they] may continue to swim in the direction that we may have chosen wrongly?” (quoted in Schmidt, 2005, p. 3).

The offering of this dissertation, the speculative invention of a model of a science for the art of teaching cannot *itself* make a difference for teachers and students but is a process through which difference might ongoingly be made – it is a way, I have said, to *go on*. Its invention, therefore, demands not only articulating desirable futures (Bayne & Gallagher, 2021), but ways toward them in the near places from which it is possible to act to make those futures, in the day-to-day moments where dreams too often dry up, where we wonder, *if* we can dream this, what must happen here now daily? In other words, how do we make dreamed-of different futures

actual? Thus, this research, insofar as it is possible, must exist between the fiction of imagined futures and the facts of visceral presents to make something different.

But not everything has to be different.

Although the efforts toward just, equitable and loving education have been, I have proposed, ongoingly limited, even stymied, by an idea of “knowing better” as the greatest good, an idea that I am seeking, here, to uproot, or at least to loosen its hold to make room for other flourishing, it is possible to understand its *purpose* as making a better future for our children. Thus, the idea of knowing better has become entwined with our love and dreams for our children; we dare not pull up one without risking the other. However, a simple test is offered by Dewey (1915): “What the best and wisest parent wants for [their] own child, that must the community want for all of its children. Any other ideal for our schools is narrow and unlovely” (p. 3). Like Socrates who claims his wisdom lay in his knowing that he did not know (Plato, 1985, 21d), the wisest parents, facing the perilous uncertainty of an unknown future for their children would acknowledge that they *know* nothing for certain, but hold firm two desires: the first, that their child is loved, which, as John Caputo (2018) says, is “is not explained or explicated in a proposition but testified to, enacted, performed” (p. 141). Education, in other words, as an expression of our love for our children, is a *practice* of love. The second is that, through education, their children move toward better living than they would without it. These two desires must form the concern not only of teachers who stand *in loco parentis*²⁹ but also a teachers’ science, which serves their concerns.

²⁹ To act “in the place of a parent” is a duty of teachers written into law in Canada by both provincial legislation and the federal Criminal Code.

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Holding these desires in mind, I dream that you continue with me, a partner, a companion, sitting at the kitchen table still, along with the many others I am grateful to think with, to imagine another science for different futures.

After all, nothing can be made without you. A science is a *community* (Kuhn, 1996). This model imagines a different community for a teachers' science based on a different story or, as economist Ariel Rubenstein (2006) puts it, fable. She says, "The word 'model' sounds more scientific than fable, although I do not see much difference between them" (p. 881). After all, she says, like fables, models are both unrealistic and simplistic, but this is their advantage. Although they are developed from actual experience, they don't represent facts or evidence but rather make an idea visible to us or imaginable to us by both clearing away the many restrictions of reality and, at the same time, making the idea concrete. With models/fables, we move in what Rubenstein calls an "unencumbered" state (p. 881) and from the new seeing thus enabled can return to our reality to make something with the idea in the actual world.

Between the possibility in a model and making it actual are thousands of considerations. But it is a beginning for what is not yet.

At the same time, to invent a model *for* making, it must be make-able, even if it is speculative, created with materials at hand in the actual world. Although invention, as Brian Massumi (2002a) says, is a plug-in to the impossible, it is only by plumbing that connection between what exists and what we dream of that the new can arise. Plumbing might seem plodding work for a speculation. And yet, without it, there exists only a void between dreams and actuality. All our dreaming can make no difference.

What follows, then, in imagining a model for a new science for education – a teachers' science – is a consideration, first, of what love demands of us as educators, this new premise, a

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working idea for developing the methods, structures and standards for the science. To do so, it is necessary to continue to think about conventional science, not to argue against it, but to unpick the threads of what now exists to weave with them otherwise. Whatever is imagined must be spacious enough to make with in the wild varieties and vagaries of actual living and yet solid enough, sufficiently whole and substantive, that it cannot be dismissed as mere dreaming.

The plug-in, itself, while otherwise, cannot be impossible.

In chapter five, however, we can test the plumbing to see what impossibilities – the revelatory, the miraculous – can arise from it.

But first a new model must be sketched out. Something so sweeping as a new model might seem at odds with dissertation research in distance education, which is a *specialty* with a particular focus. Yet I know no other way to meet the responsibilities of love and my obligation, as a teacher, to children. And I know no other way to ensure that the technologies that make distance education possible, abetting, at the present time, habits of replication, do not thwart the responsibilities and obligations of love but, instead, make loving education, wherever we are, possible.

Although I am telling this model, this fable, many others are working with me in other places and throughout history toward the same end – just futures for our children. They are with me as companions, as voices at the kitchen table where we are gathered. Some of their voices are heard here, threaded throughout this invention, to weave colour and counterpoint so that, even in the speculative between, something solid enough emerges to act as a wedge between what is and what we dream of, not to close the gap with its weight but to keep it open long enough so we can step through into otherwise. And although their names do not appear here, there are the testimonies from children, teachers, parents, Elders, chance-met strangers. Their stories have no

less weight than those whose names are widely known. I imagine them all with us, you and me, sitting at this roomy table. And all the new friends that you invite as well.

I wish that we could drink cups of hot tea and eat thick cut sandwiches while I show you this model. I wish I could set it on the table between us – overlays, photos, a model that leapt up off the page in all its dimensions. At the edges of my mind such images skitter and are lost. All I have are these words. I hope you can imagine them in colour. I hope you can see them dancing. I hope they sing.³⁰

And I hope most of all that what follows is spacious enough for all your revisions, additions, connections made from your rich knowledge and other perspectives. I dream that you are making something with these words in the worlds you live. In the worlds you love-

Constraints of love

What surprises me the most in my investigations, wonderings, wanderings, searching and re-searching, my efforts toward dreams of beautiful teaching and learning, is that in all that time I simply accepted that teachers need to understand what science tells them and that science, for its part, has no obligation to understand what teachers tell it. It need only explain to teaching and this (authorized) explanation is the source for change, that once we know better, we who have been told would do better. In other words, I have meekly accepted transmission from science to teaching, a method that Dewey aptly describes as “one of imposition from above and from outside” (1938, p.18), a method that current research *itself* argues is not conducive to, and is

³⁰ As mentioned, I have tried to capture an image, nonetheless. There are two versions. The first is an illustration of the entirety of this text and the new model is set within it (Appendix A): it is made with sticky notes and marker on cardboard. The second, Appendix B, focuses on the model only, a very simple overview that sets out its broad outlines. Neither is what I imagine when I imagine an illustration but may support your own imaginings.

indeed more often detrimental to learning, growing or development.³¹ Indeed, this is the very research I have repeatedly referenced in an attempt to overturn transmission methods in classrooms (by, in turn, telling it), not only because transmission is ineffective but because it is antithetical to theories (and dreams) of democratic, inclusive, and anticolonial policies that institutions in Canada espouse. Yet while transmission methods (from those who know better to those who know less) *continue* to sit at the head of education, nothing can change in actual practice. As Dewey (1929b) argues, teachers are “the channels through which the consequences of educational theory come into the lives of those at schools...If these teachers are mainly channels of reception and transmission, the conclusions of science will be badly deflected and distorted before they get into the minds of pupils” (p. 47). So the teachers, so the students. Our dreams are stopped at the logjam of the actual.

Yet simply removing the constraint of imposition does not ensure that education, either in its science or practice, is loving; love imposes its own constraints that must be heeded to enable new possibilities. After all, love – and therefore a science built upon its foundation – does not mean that “anything goes.” Indeed, if one considers scientific thinking as Isabelle Stengers (2018) does, “as minimizing thought caprice and maximizing thought constraint” (p. 90), it is important to attend to those constraints. We have become accustomed to the constraints derived

³¹ Research across a range of fields supports this, including the learning sciences which attempts to draw from multiple fields to understand optimal learning (the scope of its foraging for learning makes it a useful source – but not authority - for a teachers' science). In a synthesis of research on optimal learning, Keith Sawyer (2008) identified four key findings: the importance of deep rather than superficial learning, the importance of coherent, connected learning, rather than discreet and decontextualized exercises, the importance of collaboration rather than isolation - confirming the ideas James, Dewey and Whitehead (and *many* others) have long argued for. Deep, connected, coherent, collaborative learning cannot be “delivered.” Not only do these findings suggest that an obstacle to the implementation of scientific findings is the delivery of its findings, but affirm that teaching is a complex, subtle, and delicate art - and that “optimization” is only the *beginning* of our work, a beginning, amongst many possibilities, that may or may not be helpful. There are other places to begin.

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from an idea of science as knowing better; for example, those identified by Feuer, Towne and Shavelson (2002) as foundational “norms of behaviour” (p. 7) for all scientific endeavors:

- Pose significant questions that can be investigated empirically,
- Link research to relevant theory,
- Use methods that permit direct investigation of the questions,
- Provide a coherent and explicit chain of reasoning,
- Yield findings that replicate and generalize across studies, and
- Disclose research data and methods to enable and encourage professional scrutiny and critique. (p. 7)

Yet these fundamentals are insufficient, and in some cases, obstructive for working in symbiosis with teachings' art. It is taken for granted that these norms are “scientific” rather than habits of practice, constraints based on a particular idea of science. It is singularly unimaginative to say that science cannot be understood or practiced otherwise or to assume that how it is practiced now (or within a given community of scientists) is as it should be. As Isabelle Stengers (2018) says, another science *is* possible.

Because love is often regarded as both whimsical and capricious, it is important to consider its constraints for a new science that is no longer above and outside the practice of teaching but acts in correspondence with it:

- Investigate questions posed by teachers and *with* teaching,
- Link its research to living *wholeness*,
- Yield findings that offer provisional possibilities for *revision* rather than replication, and

- Disclose its data and methods to encourage wider considerations from living practice, within which, it is always an *amateur*.

To begin to imagine another science, these new “norms of behaviour” must be imagined.

Otherwise, we can only, at best, do better at what has always been done (Stengers, 2018).

With-ness

Although in his speculations on an educational science, Dewey never uses the word love or even democracy, the process he describes makes room for both. Indeed, his ideal of democracy – and for Dewey (2003) “democracy is itself an educational principal” (LW.13.295) – is loving. He argues for democracy over authoritarian forms of social life *because* it is loving and therefore leads to better living: “the principle of regard for individual freedom and for decency and kindness of human relations come back in the end to the conviction that these things are tributary to a higher quality of experience on the part of a greater number than are methods of repression and coercion or force” (p. 34). For Dewey (1916), a democracy is more than a form of government:

It is primarily a mode of associated living, of conjoint communicated experience. The extension in space of the number of individuals who participate in an interest so that each has to refer his own action to that of others, and to consider the action of others to give point and direction to his own. (p. 101)

Yet as long as authoritarian methods of transmission run behind the institutions that are our *channel* to a better future, the promise is an empty one.

A teachers’ science, therefore, if it begins with love, must eschew authoritarian methods and work, instead, within a mode of associated living; it must take an interest in the concerns of those for whom it researches, and take its direction from them; it must accept *their constraints*

and obligations as its own, and also walk beside teachers at the site of actual teaching and learning to both set the problems it researches and to evaluate the solutions it offers. As such, our science must move *with* teaching rather than at a distance from it. It is neither above nor outside but alongside. This demands a *significant adjustment in approach* that redefines or, at least, refines, the way science might work that is in alignment not only with teaching but in synchrony with what its living researchers in a living world *can* do (Kauffman, 2016). As Dewey (1929a) remarks, a human is “within nature, not a little god outside, and is within as a mode of energy inseparably connected with other modes, interaction is the one unescapable trait of every human concern” (p. 434). Indeed, the more effort is made to *remove* that interaction through exacting methodological procedures, tightly controlled parameters, precise and formal, formularized, rigorous extraction of data, the more one attempts to be *reasoned* in analysis, the poorer the possibilities generated: *one cannot generalize from the special cases so derived* (Rosen, 2000). Even the anomalies become special cases of the method as Dewey (1929a) notes:

Mechanical uniformity of studies and methods creates a kind of uniform immobility and this reacts to perpetuate uniformity of studies and of recitations, while behind this enforced uniformity individual tendencies operate in irregular and more or less forbidden ways. (p. 62)

In other words, the individual overflows, always.

The idea that science, variously expressed, has kept at its heart, “that the infinite ascertainment of fact and correction of false belief are the supreme goods” (James, 1912, p. 66), the notion that science is *distinguished* by its effort, through its methods, to control “extraneous sources of influences when trying to explain an occurrence” (Cohen, et al., 2011, p. 3) so that it can reveal what is *really* or *most likely* true, in a teachers’ science, in order to move *with* the

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living, must be *within* the constraints of a practice of loving. That does not mean that ascertainment of fact and correction of false belief are no longer important to a teachers' science, only that the work toward them becomes a source for rather than an authority over a practice of love; science works *within* a larger idea – love – that gives it its point and direction and provides, therefore, the greater constraint.

Wholeness

The constraints of love, however, are not mechanical (in other words, inflexible, limiting, reductive) but living (porous, enabling, generative). Science built from it understands that problems overspilling its solutions are not indicative of a need for greater rigor in its methods or tighter control, but a need for greater *expansiveness*. In mathematics, noncomputability is an indication, Robert Rosen (2000) argues, that “we are trying to solve problems in too limited a universe of discourse” (p. 2). So, too, the incompatible, the incommensurate, the incomprehensible. These difficulties arise in science, he says, by standards *external to the problem* like “objectivity” and “context independence” which, he says, “is a mind-set of reductionism, of looking only downward toward subsystems, and never upward and outward” (p. 2).

To look up and out is an attempt to see, at least as far as our meager human imagination can stretch, in wholeness. Consider two related and (so far) insoluble problems. St. Augustine (426/1972), in his reflection on the nature of sin – how is it that evil exists if the world is good? – concludes, “A picture may be beautiful when it has touches of black in appropriate places; in the same way the whole universe is beautiful, if one could see it as a whole, even with its sinners, though their ugliness is disgusting when they are viewed in themselves” (pp. 456-7). W. E. B. Du Bois (1920), in thinking about racism, realized that neither the “pert and easy

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encouragement” (p. 225) of his “pale and positive” (p. 221) friend, nor his own dark despair, “can lay hold of the roots of these things. And first and before all, we cannot forget that this world is beautiful. Grant all its ugliness and sin – the petty, horrible snarl of its putrid threads, which few have seen more near or more often than I – notwithstanding all this, the beauty of this world is not to be denied” (p. 225). A focus on parts (murderers, the unkindness of strangers, inequity in schools) engenders despair (and so a shrug – what can *I* do?) or easy assurance (ready-made solutions or pert and picturesque Utopias), obfuscating the path toward harmony (many parts moving – even if momentarily – as one) – which is beauty.

What is living is always *whole*. Our students, Whitehead (1929a) points out, “are alive, and cannot be chopped into separate bits, like pieces of a jig-saw puzzle” (p. 38).³² So, too, what is loving, in the sense that Derrida (2007) describes, as the love of *who* not *what*, who the person is in their wholeness, not parts (qualities) that we extract from them and then are inevitably disappointed because the part we once appreciated no longer exists in the form we loved, if such is love. Thomas Merton (1979) describes love itself as “a completeness, a fullness, a wholeness of life” (p. 27).

Wholeness is necessary for beautiful (loving, living) teaching and is therefore a constraint for our science. To work *within* wholeness and toward wholeness, it makes little sense to focus on *making certain*, gathering up facts into a reasoned argument with a step-by-step progression, looking down to make things *fit* there, rather than attending to the whole it is part of, the

³² This can seem too obvious to state but the proliferation, for example, of learning analytics, the extraction of data from students as a means to solve how to “optimize” their learning continues to dominate discourses in education and indeed is accelerating with the ready adoption of generative AI within education research and practice. The very idea that our children might be so understood is contrary to love entirely. Of additional concern, too, is that EdTech is dominated by industry in a very lucrative and rapidly growing market (valued at USD 144.64 billion in 2023) whose primary concern is profit not love (Forecasts, 2024-2032, 2024).

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profusion, the wildness of living, where what we know is *only ever partial*. For wholeness, we must look up and out, moving tentatively (our every action, after all, is consequential) toward what is not yet (the futures our dreams can make), hesitantly, not rushing in a beeline to a given destination (we cannot *know* the way). Or rather, we must make a *living* beeline, since bees (and other foragers, even speculative ones) move efficiently and swiftly to return to the beginning, to home, touching back over and over as, in their explorations, they spiral outward from it in their widening paths. For a teachers' science, home is where *actual* teaching and learning takes place in the vital contact between teacher and student (Dewey, LW.15.182). Its explorations, however, are guided by our dreams, perhaps most poignantly described by Janusz Korczak (1919) in his address to the children who graduated from his Orphans' Home in Poland (later he would walk hand in hand with his students onto the train to Treblinka and to their certain death): "We give you only one thing to take with you. A longing for a better life, a life that does not exist today, but which will someday come into being: A life of justice and truth" (in Efron, 2008, p. 43). All our explorations are to find ways to this sweetness and to bring it home to our children's futures.

A teachers' science, therefore, cannot mistake its own reductiveness as whole. Jean-Marc Levy-Leblond (1994) points out that "science is reductionist in its very essence. It would be as absurd to reproach it for this as it would be to criticize a fish for not knowing how to fly. It is because of that very drive towards reduction, simplification and impoverishment of reality that the processes of science have been successful" (p. 214); however, he adds that the only error of that reduction is to consider the methods of science "exemplary and universal, and to try to model on it any other approaches to reality or ways of understanding the world" (p. 214).³³ After all, science is not alone in reductionism. There is no way of human thinking that is not an

³³ It is possible to view the attempt to make one way of understanding exemplary and therefore an authority over other ways as a *colonial* mindset applied to and through science.

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impoverishment of reality. We cannot step back far enough, our vision is not sufficiently panoramic, our attention is too limited, our capacity to assimilate vastness, even with our latest gadgets, is too meager. The only path away from reduction is *with* others.

However, science, presently, exceeds its authority (or it is *used* as an authority to give individuals or organizations authority).

A teachers' science, in knowing that its knowing is partial, that it is only a fish, after all, is open to – eager for – interaction with other knowledges, listening intently, for example, to the bird who sees from a perspective it is incapable of to expand its own knowledge to better serve teaching's art. Its researchers have no need to make themselves two sizes bigger than others by belittling or dismissing other knowledges, or to imagine that they have discovered the yardstick by which to measure the whole. They remember, as Dewey (1929a) says, not only their “own littleness and impotencies” (p. 420), their *transiency* in the vastness of the universe, but hold firm to the potency of a dream (what else is education but a dream for our children?), and the belief that “the effort of thought and struggle which it inspires are also the doing of the universe, and they in some way, however slight, carry the universe forward” (p. 420). And more - “that such thought and effort is one condition of the coming into existence of the better” (p. 420).

Otherwise, how would they (how can we) go on?

A teachers' science, this science we are imagining into being, I with these words, you with me, writing more possibilities in the margins, if it is loving, if it is living, is constrained by wholeness; it is not that it cannot value its own contributions and (so far) partial conclusions, but that it is aware, always, of the need to look up and out, as well as with the many others who share its concerns and obligations. Indeed, its concern is not to *close* the gap between its theories and

the practice of teaching; neither can be understood in isolation from the other. Theory is derived from experience and experience leaps into the gap theory makes.

With any new knowledge that a teachers' science discovers, however, we (all of us concerned, in one way or another, with the education of children) are not more *certain* of our way but more aware of the widening circle of our ignorance (Firestein, 2012) and therefore more willing, not to correct *others* but *to revise our own thinking* as we look up and out from the little knoll of what we now (so far) know before stepping forward again, remembering always that it is to bring our learning home (where the children are) that we adventure.

Revision Not Correction

When the best and wisest parent sends a child to school, it is not because that child, an absolute (whole) singularity, although already worthy, is “finished” and only needs to be kept safe until a certain age but because the child is still growing and becoming into an unknown world (as, surely, we all are, always, until death). The parent hopes to *extend and enlarge* the child's possibilities for better living through education. Nor do parents send children to school to be *made* into something, “adjusted” or “improved” to become more useful/successful, some predetermined “best” person, given their capacities and current projections of the future. Indeed, because education is a source for their *continued* development, children cannot simply be “known” via testing, for example, which even at its best cannot test the whole of a child, never mind the dynamism of their living growth and development via learning.

Yet interventions and instruction for improvement (so familiar in schools that they seem to define what schooling is) *depend* on a known child and a known end for their determinations of success. If, however, both the child and the future are unknown or known only through inferences, our beliefs about both must remain open to revision not only with new information

and within new contexts but as we and the child grow through learning – and with that growing, our understanding of *desirable* – which is different from predicted – futures. A teacher must always experiment in methods, moving with the growing child within a variety of interactions in any unfolding experiences, revising along the way. There is no method, procedure, or strategy that can be deemed “correct” from outside unfolding experiences, one that can be “applied” in a given situation (in learning multi-step addition problems, for example) with children in general categories (all seven-year-olds or all novice learners) or even a more precise categorization, for example, children with severe autism. However, knowledge derived from such categorizations (reductions) *can* widen the range of possibilities or offer useful starting places for teaching and therefore learning.

Unlike correction which must *already know* the right answer and therefore fixes to improve toward a given standard or value, revision accepts contingency, variety, variations, multiplicity, possibility. Correction sets the value *outside* of who we are and what we are making and tells us how we or our work can become of value if we “meet expectations” by “doing as we are told.” Corrections, as a judgement imposed from outside and above, assumes a predetermined end. The scope of becoming is thereby reduced to that thin and meager strip between (the known) here and (a known) there.³⁴ Revision, which cannot be handed down from *outside* the experience itself, is *vital*, is *expansive*: it is an affirmation of other and otherwise, an

³⁴ Correction is a necessary part of living in community and of growing up. The constraint described is not *against* correction, only to say it is not, in itself, educative. Correction can be used in training that is *prerequisite* to becoming educated in much the same way that priming a canvas might be a prerequisite to painting or tuning a piano to playing it (although what is prerequisite, too, is ongoingly revised as new materials, methods, or values become in our becoming). In other words, it is preparation for, rather than engagement in, what matters. The danger is when schools become “correctional institutions” designed to prepare students for living outside its walls. A second and growing concern with correction as a central value in education (in both research and practice) is the role of generative AI which can correct with great accuracy and speed accelerating its foothold (and that of the for-profit enterprises who fund it) in schools.

acknowledgment of both the impossible-to-know and the yet-to-know, a gesture toward something better, all the potentiality and promise moving out and up from the already-known.

For teaching as a practice to love – and therefore, within that practice, its science – correction is not at the heart of its concern; it offers possibilities for revision, the accompaniment of growth, and is open, always, to its own ongoing revision.

Amateurism

Another constraint for a teachers' science that derives from the previous ones is a stance of amateurism rather than professionalism or expertise. Whitehead (1925) argued a century ago that the preoccupation of modern science with training professionals who “specialize in particular regions of thought and thereby progressively add to the sum of knowledge within their respective limitations of subject” (p. 196), while in the past when a fixed person kept to a fixed duty, was useful, “in the future will be a public danger” (p. 196). The danger, he argues, is that professionalism “produces minds in a groove. Each profession makes progress, but it is progress in its own groove...But there is no groove of abstractions which is adequate for the comprehension of human life” (p. 197). Fixed by its own groove, professionalism is an acquisition, a gold nugget, credentials – proof that you can confidently offer your opinion. To become a professional, Edward Said (1977) argues, you not only gain knowledge of all that has already been ascertained within your specialized area but are certified by the “proper authorities [who] instruct you in speaking the right language, citing the right authorities, holding down the right territory” (p.6). It means, Marshall McLuhan (1967) points out, “to accept uncritically the ground rules of the environment. The ground rules provided by the mass response of [their] colleagues serve as a pervasive environment of which [they are] contentedly and unaware. The ‘expert’ is the [one] who stays put” (p. 93). Once one is a professional (and gaining a doctorate

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might be seen as the pinnacle of such professionalization), one is entitled to offer corrections based on expertise. Thus, as Dewey (1929a) notes, the *expert* has become an *authority* for the living art of teaching from *outside* of its practice. Schools today have experts for every aspect of teaching (literacy, numeracy, social-emotional learning, technology, inclusion, innovation, an ever-growing list of specialties) ready to tell teachers how to improve as though teaching can be improved from outside its experiences and via one part in isolation from the whole of it. Yet the very expertise of teaching, if it might be so called, is in unknowing sufficiently to walk *with* those who do not yet know or who know differently than we do. And the very purpose of education, if its purpose is toward better futures, is to look up and out from what is, not to stay put within it.

Those who gather at the table of a teachers' science (and we here, too, sitting at a table that is yet only fabulated and where what we make is so far only imagined) even if they are professionals must act *with* teachers. They are not entitled, whatever their expertise, to speak *for* teaching. Indeed, Said (1977) argues that anyone seeking any kind of transformation toward freedom and justice – and this, surely, is the better living we dream of for our children – must be an *amateur* which he defines as “the desire to be moved not by profit or reward but by *love* for and unquenchable interest in the larger picture, in making connections across lines and barriers, in refusing to be tied down to a speciality, in caring for ideas and values despite the restrictions of a profession” (p. 5). Teaching, both its art and its science, to be – or to be within – a practice of love and for love, is, therefore, necessarily amateur, looking up and out from its expertise to see *with* the child who is always entirely new, and for whom, the world, too, is new. It is a place

beginning to lead everywhere (Whyte, 1993).³⁵

Amateurism, that is, to be moved by love, does not preclude specialism which Whitehead (1925) defines as “people who devote their lives to definite regions of thought” (p. 97). Devotion fuels the amateur. Indeed, specialism does not disavow expertise but returns it to its exhilaration at the growing edge of its own knowing, and to situate it beside and within actual experience, rather than above and outside: one becomes “expert without loss of the essential virtues of the amateur” (Whitehead, 1929a, p. 13). There, on the edge of things, specialism retains a deep awareness of “the sense of vast alternatives, magnificent or hateful, lurking in the background, and awaiting to overwhelm our safe little traditions” (Whitehead, 1939, p. 62-63). It is, after all, why we walk *with* others, despite whatever expertise we have garnered, and too, why we send our children to school so they may learn more widely than is possible within the limits of our own meager knowledges.

Previously, when those with expertise could not easily meet with those who had a problem of practice, remote delivery was the best service, the more efficient the delivery, the more precise and accurate its already-verified transmission, the better. Yet now, in the always shifting contexts of postdigital living where whatever can be delivered is already stale, and when twenty experts are able to gather together in a room in an instant to assess, think, consider in living time, the very idea of one teacher alone with thirty children seems, surely, as obsolete as floppy disks and buggy whips, and a continued focus on optimized delivery of pre-packaged information, archaic. We now have the capacity to apply loving, living, and local solutions that

³⁵ In the beginner's mind, says Zen master Shunryu Suzuki (1970), “there are many possibilities, but in the expert's there are few” (p. 21). It is possible, too, to imagine this as a mindset – even a norm of behaviour - *necessary* to science. Richard Feynman (1998), in describing the purpose of science argues that science “is not done for the sake of an application. It is done fore the excitement of what is found out” (p. 9) – this unquenchable interest in what is not yet known.

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are monitored not by abstract and external standards but by people in community thinking, revising, inventing toward better living together. Yet we can make anew with new technologies only if we have a new idea for which to put them to work. At present, they extend the reach of science's authority *over* education.

But it could be different.

In a teachers' science built upon an idea of love and within its constraints, expertise is not called upon to correct, fix or authorize, but as *a source* for ongoing invention, which is, as I have argued, necessarily the method of teaching and therefore its science, even within its roomy varieties of expertise and knowledges. In their work for a teachers' science, individuals step out of any professional groove and into an open space where there are what William James (1909a) calls "possibilities that take our breath away" (p. 305).

We are all, after all, amateurs of loving, living, and the future.

Love as a Working Idea

I have dwelled first on the dispositions or habits or norms of behaviour that are constraints of love for a teachers' science, since its loving *involvement* with teaching seems counterintuitive to our understanding of science and even, as under its authority, of education. Indeed, to change what we do in education, we must change our *idea* of education, and that idea must provide not only new dispositions but also new directions. To repeat, Thomas Kuhn (1996), in his description of the development of science, argues that to make a *new* science, the question of whether it *is* a science is not of first significance; what matters is that "the groups that now doubt their own status achieve consensus about their past and present accomplishments" (p. 161). Indeed, it is a commitment to agreed-to ideas, when they become *given*, when they, therefore, provide *the direction and directions* for going on that scientists can acquiesce to the

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same rules and standards that determine “the legitimacy both of problems and of proposed solutions” (p.109). Without such consensus, all facts, Kuhn says, are “*mere* facts unrelated and unrelatable to the continuing progress” (p. 35) of a science.

The question for this invention, therefore, is not – is a science developed from love a “real” science? – but *what is the science that love makes*.

Since a teachers’ science is yet a speculative model only, Dewey (1929b) suggests its making must start with “*working* ideas” (p. 55). Working ideas are not imperatives, nor principles, but possibilities to start from, open, still, to other imaginings, and therefore more illustrative than explicative. After all, to the extent that something is new (or not yet), it cannot “fall back” on the already known and therefore needs “large and fruitful hypotheses” (p. 55) that are necessarily philosophic rather than scientific, not as *separate* from concrete educational experiences, which are the source of its science, but to look up and out from preoccupations of the immediate and urgent that too often beset practice. Dewey points out that he does not mean philosophic in the professional sense but as the effort of anyone who makes the attempt to see “life steadily and see it whole” (p. 57) – that is, philosophic in an amateur sense and in the mother tongue. However, the work of an educational science, he argues, cannot “be reduced to the task of refining and perfecting the existing mechanism of school operations” (p. 60), in other words, “improved use of means already given” (p. 60) or “new ways of accomplishing more efficiently ends already current, but means that will yield consequences, ends, that are qualitatively different” (p. 60). Indeed, he argues that “we can assign means to science and ends to philosophy only under the condition that there be persistent and unremitting interaction between the two” (p. 60).

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Given the intimacy of its art (existing in the vital contact between teacher and student) and therefore of its science that thinks with it, it is necessary for the agreed-to ideas to remain “working” – that is, they must be consented to in each community, drawing from the dreams and live possibilities of each place and through persistent and unremitting interaction between the many knowledges and perspectives available. The very idea of love, after all, has to be ongoingly remade as our understanding of love grows. However, if, as a starting place, both our art and our science (and all those concerned in the concerns of our work) are constrained by love (a philosophic idea), then each becomes a makeweight for the other preventing on one hand, mere whim or fancy and on the other, stultification, making room for growth in the fertile space between. Love, because it is always both intimate – and therefore infinitely varied – and growing – therefore always evolving – cannot prescribe principles. However, it is possible to describe the *responsibilities* of love, which, although *ongoingly defined in living*, can become working ideas representing obligations that provide point and direction for a teachers’ science and, with it, the development of teachings’ art.

Responsibilities of Love

Wise parents send their children to school rather than keep them at home because they hope, in so doing, by extending and enlarging their experiences, to strengthen and grow both their capacities *and* their community. Living better is not accomplished by living better *than* others – in other words, education as competition – but by creating a wider, more loving, and harmonious communities to live *with*. No one, as John Donne (1614/1974) so beautifully reminds us, is an island, “entire of itself; every [one] is a piece of the continent, a part of the main” (p. 1215). Death or harm to another diminishes us because we are *involved* with them. The

wider the circles of shared participation and the denser the webs of relations our children dwell in, the stronger the bet for better futures.

Yet intolerance, hatred, and cruelty still cast long shadows on the living, and lurk not only in distant lands and dark alleys but in schools and grocery stores and in the parks where our children play. Dewey (2003) argues that a more generative and generous future is only possible if in our daily lives, we are *moved* by each other, by a belief in others:

A generous belief in their possibilities as human beings, a belief which brings with it the need for providing conditions which will enable these capacities to reach fulfilment. The democratic faith in human equality is belief that every human being, independent of the quantity or range of [their] personal endowment, has the right to equal opportunity with every other person for development of whatever gifts [they] have. (LW.14.226)

Education, as so imagined, is responsible for providing conditions for the development of the gifts of our children as an enactment of our faith in them. That faith engenders a *practice* of love, which, after all, “is a bet, a wild one, placed on freedom” (Paz, 1995, p. 67), not our own, but the freedom for those we love which is, surely, our best promise for their futures of better living.

I offer, here, a description of the responsibilities of educational love for growth and grownupness as enabled by experiences of desirable difficulties.

Educational Growth To be moved by love and faith in our daily work demands, first, that the idea of education as preparation for a remote and *predicted* future be replaced by one that imagines education as a process of living *now* toward *desired* futures. Or rather than replacement – which suggests the destruction of the traces of our paths and past – a reconsideration or reimagining of what it means to prepare.

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Educational growth – that is the development of individual capabilities and gifts – cannot be preparation, if what we mean by preparation is the *acquisition* of knowledge, skills and attitudes that are prescribed as prerequisites for success in the future. Not only is there no knowing what will become important for the future, but as Dewey (1938) says: “It is a mistake to suppose that acquisition of skills...will automatically constitute preparation for their right and effective use under conditions very unlike those in which they were acquired” (p. 47)³⁶ – in other words, for living. What is more, even if students will need the skill of reading, still, in the future, what will constitute reading may well be something entirely other than what we know now – or even what we can imagine. Finally, growth is not an acquisition, a new car, a pretty blouse, but like strength and love, made in making: it is organic rather than manufactured, ongoing, rather than “done.” Growth is internal to organisms and dependent on the gifts they have as well as nourishment from the environment; their growing into them is a gift to our community.

That is not to say that the study of prescribed competencies and content is of little use, or that careful consideration of what children study is pointless, only that we mistake its usefulness. An education, in essence, makes visible an ever-broadening array of things to care about and for. What matters, however, beyond this expanding horizon of caring, is the attitude formed by study, which, as Dewey says, is “that of desire to go on learning” (p.48), since it is this going on of learning that is the best “preparation” for the unknown future. Certainly, Mrs. Swaffield, trying (with little success) to teach my brother to read, could not imagine a future where a device in his

³⁶ The problem of learning transfer has been extensively studied. In a synopsis of the research, Will Thalheimer (2020) notes some common factors that find agreement across studies: that improved transfer occurs when students develop skills and concepts by *doing* in the present rather than rehearsing for a suppositional future. As Dewey (1938) argues, since we only live at the time we live, it is only by “extracting at each present time the full meaning of each present experience are we prepared for doing the same thing in the future” (p. 49). In addition, current research finds that transfer is more likely if students are learning what they desire to learn (and therefore are more engaged in their study) and are supported and encouraged to do so, ideas of significance in, and coherent with a practice of love.

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pocket could read to him, write for him, and carry a world of literature to offer him at a click.

What is important to care for necessarily changes as the world changes,³⁷ not only the more obvious technological changes, but also a collective growing up through education itself which is a “wick of desire” (Rich, 1993, p. 241). It is therefore imperative, Dewey (1916) says, that “every energy should be bent to making the present experience as rich and significant as possible. Then as the present merges insensibly into the future, the future is taken care of” (p. 65). As such, a focus on improvement, ranking, and success (which can only be defined against what already is) are distractions and very often an impediment to desire. Simone Weil (1977) argues that the significance of study for students is that “in making an effort of attention with the sole idea of increasing [their] grasp of truth, [they] acquire a greater aptitude for grasping it, even if [their] effort produces no visible fruit” (p. 46). This effort to increase, grow, widen which is an end in itself, Weil adds, “can only be led by desire. For there to be desire, there must be pleasure and joy in the work. The intelligence only grows and bears fruit in joy” (p. 48). Thus, as Dewey (1938) argues, the art of teaching is “to select the kind of present experiences that live fruitfully and creatively in subsequent experiences” (p. 27-28).

Information about acquisition, therefore, for example, from researchers about phonics acquisition in reading, even as applied in “personalized” programs informed by data analytics to measure individual clicks, is to reduce the whole continent of experiences to a clod. To measure results only by “visible fruits” (Weil, 1977, p. 46) is to turn away from joy in making, learning, growing, working, instead, toward producing a person with a given set of skills to serve another’s ends (whoever determines success). The collateral consequence is unlovely and

³⁷ Emberson’s 1883 manual on how to teach argues that girls ought to be initiated into the “delightful and profitable occupations of a housewife” (p. 17), while boys should study Greek and Latin classics to strengthen their memory. It is highly likely that future students will be astonished by, and even ridicule, today’s curriculum.

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unloving, and indeed, miseducative, in that, all too often, it “has the effect of arresting or distorting the growth of further experience” (Dewey, 1929a, p. 25). What is learned all too often (when a student fails to “measure up” within the narrow confines of what is measured) reduces rather than expands the horizons of children: the desire to go on learning is diminished and there is a contraction in their sense of themselves, their capacities, in learning, in potential, in possibilities into the future. As Dewey (1938) writes:

What avail is it to win prescribed amounts of information about geography and history, to win ability to read and write, if in the process the individual loses [their] own soul: loses [their] appreciation of things worth while, of the values to which these things are relative; if [they] lose desire to apply what [they have] learned and, above all, lose the ability to extract meaning from [their] future experiences as they occur? (p. 49)

Thus, as a responsibility of love, a working idea for a teachers' science that intersects with our art, the efforts of its research are toward educational growth: they are not aimed at improved performance of prescribed outcomes but to increase, inspire, widen, and fuel the desire of a student to go on learning.

Grownupness At the same time, the direction of that desire is a concern – and key responsibility – for a loving education. As education philosopher Gert Biesta (2017) argues, the goal of education is not merely growing but *grownupness*: to desire what is desirable, “not only for our own lives, but also for the lives we try to live with others on a planet that has limited capacity for fulfilling all the desires projected onto it” (p. 4). Thus, a teacher, in selecting experiences, Dewey (1938) says, “has a long look ahead, and views every present experience as *a moving force* [emphasis added] in influencing what future experiences will be” (p. 87). Yet desirable education, Sian Bayne (2023) argues, is not valued merely “for its ability to ‘deliver’

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differently-desiring subjects, but for its fundamental opening-up of space for desiring differently” (p. 13), so that the children can also steer otherwise if we have steered wrongly. It is insufficient, therefore, to influence students to *acquire* competencies, how to get along with others, for example, but to *desire* to do so, which can only be developed in community. In other words, grownupness, too, is made in the making. Instruction alone will not suffice (McLuhan, 1967). What is more, not only do children grow into grownupness, but even as grownups, we are always revising what it means to be grown up and thus, the long look we take, taken with new perspectives toward enlarged horizons, is ongoingly reviewed, adjusted, revised in community, drawing from the past to reconsider the present for the futures we dream of for our children. The question for education, philosopher Susan Neiman (2014) notes, is “how can we possibly help to fashion capacities that are better than those we possess ourselves, even if we want to?” (p. 32). It is for this reason, she says, that Kant argues that to educate is “the greatest and most difficult problem that the human being can be given” (in Neiman, 2004, p. 32). It demands a refusal to rest in the groove of professionalism. Growing up is continuous and also courageous, Neiman argues:

Courage is required to live with the rift that will run through our lives, however good things may be: ideals of reason tell us how the world should be; experience tells us that it rarely is. Growing up requires confronting the gap between the two – without giving up on either one (p. 7).

Indeed, growing up is *harder* as we get older. Not only have we confronted experience after experience that disappoint our dreams, but as Howard Thurman, explains,

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The first part of your life everything is in front of you, all your potential and promise. But over the years, you make decisions; you carve yourself into a given shape. Then the challenge is to keep discovering the green growing edge (in Keen, 1999, p. 239).

A belief in the promise of education must inspire our ongoing action on the growing edge as educators. It is in the gap grownupness holds open that growth toward better living becomes possible but only insofar as it enables action in the present which is the only way we can become “prepared for doing the same thing in the future,” (Dewey, 1938a, p.49). Grownupness is *made* through living in the stream of events that pour through our lives, as Whitehead (1929) more forcefully puts it, since “the present contains all there is. It is holy ground; for it is the past, and it is the future” (p.3).

Thus, a second responsibility of love in education, for its science as well as its art, is that the direction of experiences must be toward grownupness, which is to desire what is desirable within an ever-present awareness that the growth of others grows us, the harm of others harms us; and, too, the capacity to revise direction in “an ever-present process” (Dewey, 1938, p. 50) with new information, new perspectives, and new situations in living (ever-changing) worlds.

Desirable Difficulties Psychologist Robert Bjork (1994) coined the felicitous phrase “desirable difficulties” to describe the condition necessary for learning growth which he distinguishes from student performance (what can be observed and measured); indeed, he notes that the conditions that make performance improve rapidly are often miseducative – that is, arrest or thwart learning growth – and misdirect efforts from growing (and grownupness) to compliance or competition, that is, away from learning. Dewey (1938), too, expresses the link between desire – “the ultimate moving springs of action” (p. 70) – and difficulty, arguing that

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“the intensity of the desire measures the strength of the efforts that will be put forth. But the wishes are empty castles in the air unless they are translated into the means by which they may be realized” (p. 70). Although the fruits of effort may yet be invisible, the learner must have a sense of consummation from that effort, a feeling of joy or pleasure that fuels continued learning.³⁸ To attempt what is too difficult extinguishes desire; yet what is too easy, flattens it. When we are at ease, we coast; we are, John Caputo (2007) says, “cruising along on automatic pilot, nothing special is demanded of us, the oars are up, and we are going with the flow, hardly making any decisions at all” (p. 66-67). It is when we are troubled that we must think, which is the work of learning, and indeed, William James (1899) argues, what makes life significant *are* desirable difficulties – that in the face of “the element of precipitousness, ... of strength and strenuousness, intensity and danger” (p. 271), we, by our own striving can overcome or make or move. James distinguishes these desirable difficulties from the experiences of those for whom “by mere accidents of birth and opportunity, should have a life of nothing else but toil and pain and hardness and inferiority imposed upon them” (James, 1982, p. 171). An education should bring to our notice the suffering of others and arouse our indignation. Difficulties that are outside of our control to overcome are not desirable; to *impose* difficulty on others must be abhorrent to us.

³⁸ The idea of desirable difficulties coincides with aspects of Mihaly Csikszentmihalyi's (1990) research on the experience of flow - moments of being fully immersed in a feeling of energized focus, full involvement, and enjoyment in the process of the activity - and through which we grow. For flow there must be a balance between opportunity and capacity, such that the experience is neither so easy as to induce boredom or even apathy, nor so difficult as to cause anxiety. Any given flow experience, however, means that our next experience must be more difficult: in other words, flow is the “channel” of learning. What's more, when we are in flow, all our efforts feel effortless despite the intensity of our effort, and time stands still. Yet significantly, we are not simply going “with the flow”: we are in control of the direction.

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Yet so long as education is imposed from outside and above, its difficulties are undesirable.³⁹

When education is an acquisition (a degree, expertise, good marks), its direction is decided and therefore unquestioned and unquestionable; it is “done” upon arrival at its end. To arrive and acquire with ease and speed is to be successful⁴⁰ – superior. Difficulties, then, are not deemed desirable and those who cause difficulties (by questioning) or with difficulties (in acquiring the required learning) are excluded, shamed, or stigmatized as “a problem” or “slow” and their opportunities are further narrowed either by expulsion or through programming to “ease” or “fix” their difficulties. They are, in effect, *made* inferior by education. Yet if, rather than valuing education as a means to a predetermined (imposed) end, education is an end in itself, then “every experience is a moving force. Its value can be judged only on the ground of what it moves toward and into” (Dewey, 1938, p. 37): a widening horizon for better living.

A third responsibility of love posits that the difficulties of educational experiences are *desirable* when they move toward and into growth and grownupness – and that desirability is determined in the experience itself rather than by those who are external to it. When undesirable difficulties arise, the conditions must be revised, not the student – and not the teacher.⁴¹

³⁹ Ironically, one of the greatest dangers of digital technology, and this danger has accelerated with generative AI, is that it makes ease seem the goal of living; the focus invisibilizes and trivializes the everyday difficulties of living, learning, loving. It also makes the imposition invisible, piping it in seamlessly with every click.

⁴⁰ That generative AI can now take our most difficult tests for us with ease and speed (at a click) has raised new concerns that 150 years ago Kierkegaard (2009/1866), in the heady days of steamships, railways and the telegraph, raised: “When all join together in making everything easier in every way, there remains only one possible danger, namely, that the ease becomes so great that it becomes altogether too easy; then there will be only one lack remaining, if not yet felt, when people come to miss the difficulty” (p. 157). Almost every school assignment can be done by AI for our students today. *Lack* of difficulty is undesirable and demands our urgent attention as one of the greatest impediments to growth and grownupness.

⁴¹ An argument is often made that some people should not be teachers, an argument once also made (and that continues to be made) about some students in schools. Herbert Kohl (1994) makes an observation about children that I think can equally be applied to teachers: “I have never known a child, no

So the teacher, so the students

The art of teaching, as a practice of love, creates experiences that abide by the responsibilities of love, too – and each experience is made anew with new materials at hand for and with particular students or communities of students in a given moment. Teachers must involve their students in an experience in which while undergoing difficulties (desirable ones), the students, through their attentive participation, feel pleasure, joy, delight and develop a desire to go on learning what is desirable to learn. If schools are going to *in actuality* fulfill the desires of wise parents for their children, the art of teaching is necessarily, as Dewey (2003) argues, “complex, intricate and subtle” (LW.3.255) and its ongoing development of first consideration since teachers are the channel through which those desires become possible. So the teacher, so the students.

Indeed, given such complex work, teachers cannot be merely, as Dewey (2003) puts it, “a servile rubber stamp” (LW.2.123) or “clerks filling out recipes that are prescribed by others” (LW.15.187). However, faced with overwhelming difficulties themselves, alone in a room with many children, mandated to somehow “get them” to achieve a wide range of prescribed outcomes in a prescribed timeline, the very idea of an art of teaching is an empty castle in the air. Many teachers simply accept recipes as prescribed (and these are instantly available now at a click) and stamp grades according to pre-approved standards. Some take up new ideas for inclusive education (those told at universities, at conferences and in the latest education publications) but more often than not, given the unchanged conditions of teaching, they revert to

matter how superficially unmotivated she or he might see, whose indifference, hopelessness, or rage did not mask a lively imagination and dreams of challenging work, lasting love, and a fullness of being” (p. 72-73). Such a “generous belief in the possibilities as human beings” (Dewey, 2003, LW.14.226) shifts our attention to faith in their potential rather than, as superior beings, fixing them – and prescribing what is desirable *for* them.

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those passed down from their own teachers or convert to click and play teaching, recipes that “work” in the conditions of classrooms, passing out to their students textbooks, worksheets, corrections, and gold stars – practices easily encoded in digital programs – thus both keeping order in their classroom and, too, keeping the long familiar order of things in place.

In response to the seeming reluctance of teachers to change to evidence-based practices they are told about (for more engaging, inclusive, and equitable practices), educational research and policies often attempts to make teaching easier through more professional development in effective strategies and more leadership to support their implementation (Hattie, 2023; Fullan & Edwards, 2022) rather than to ease the conditions within which its difficult art is practiced, thus stunting the growth of teaching – and so learning. In addition, the efforts of research (even those meant to make easy) *add* to the already complex, even impossible work of teaching by relentless demands to know more or know better what science knows, forgetting, as William James (1899) says, that science is not of first significance for teaching's art, except as interest, inspiration, and refreshment: “Our teachers are overworked already. Everyone who adds a jot or tittle of unnecessary weight to their burden is a foe of education” (pp. 12-13).

A teachers' science understands its role in supporting the *difficulty* of teaching such that it becomes joyful and pleasurable: so the teacher, so the student. It does not aim to make teaching so easy that teachers can cruise on autopilot (an urgent concern as advanced technologies promise ease, efficiency, and efficacy to overworked teachers);⁴² nor does it add difficulty so that giving up is the only option. In neither case is growth possible. “The art of education” Whitehead (1929a) says, “is never easy. To surmount the difficulties, especially those of

⁴² In the UK, [a new government project](#) was announced to enhance AI generative tools to help teachers with their marking, ease their administrative burdens and provide access to creative and inspiring lessons.

elementary education, is a task worthy of the highest genius” (p. 51). Genius, however, is rarely granted. Together is our best hope in our work for better living in the futures of our children. Just as the role of teaching is not to make learning itself easy but to create experiences by which learning can flourish for each child, so, too, the role of a teachers’ science is not to ease the difficulties of teachers, but to ensure that conditions exist by which their difficult, complex (beautiful) art can develop. In its loving concern for teachers, it makes possible the loving concern of teachers for their students.

Methods as Living Processes

Inventing a teachers’ science with the idea of love at its heart is revolutionary – or at least, since this invention is speculative, a model only, it is what Kuhn (1996) calls “extraordinary research” (p. 86) – research outside of what is “normal” to the profession – that seeks to open ways for “a new set of commitments, a new basis for the practice of science” (p. 6). Then the revolution.

If science is “a special method of finding things out” (Feynman, 1998, p. 4), then it is of first significance to reconsider methods. Because love demands methods that minimize suffering and maximize flourishing, conventional methods of finding that focus on what can be replicated and generalized – are insufficient: both suffering and flourishing are intimate – inimitable – and diverse. To imagine otherwise other methods must be imagined.

Indeed, to fulfill the responsibilities of love, this new science cannot fall into the trap Whitehead (1929a) describes as commonplace in revolutions:

Every intellectual revolution which has ever stirred humanity into greatness has been a passionate protest against inert ideas. Then, alas...it has proceeded by some educational scheme to bind humanity afresh with inert ideas of its own fashioning. (p. 2)

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This educational scheme includes a method for *replication* of those ideas, such that the ideas themselves become subservient to it. It *arrests* growth. In effect, in breaking from stultifying traditions of the past, it installs new traditions that, too, stultify. However, there is no *necessity* for method to be used as a process of replication. It is, rather, a habit of conventional science based on its current premise.

After all, the gift of science is not in its methods of replication but in its methods for *finding things out* and the knowledge that arises from things found out (Feynman, 1998). For art, as Dewey points out (1916), these things found out provide “a cumulative body of fairly stable methods for reaching results, a body authorized by past experience and by intellectual analysis, which an individual ignores at [their] peril” (p. 200). Yet these “general methods,” he says, “are in no way opposed to individual initiative and originality – to personal ways of doing things. On the contrary they are reinforcements of them” (p. 201).

It must be possible to organize “fairly stable methods” that a teachers’ science finds out – recipes for the doing of our art – not to continue in the same way with them, but to continue *otherwise* from and with them, so that each making enriches our art and extends the patterns of possibility. What follows, then, are possibilities for methods that develop with and from the experience of teaching as a practice of love rather as an imposition external to it.

Loving recipes

Recipes, the accumulated knowledge of fairly stable methods, *are* necessary. Although our art is inventive and ever new, moving with the living and in loving, it is too arduous (undesirably difficult) to maintain day in and day out if we always start from scratch – and, too, irresponsible, since much is already known upon which to build next. Indeed, the very purpose of this dissertation is to invent a science to organize the current stock of ideas from a wider range of

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knowledges to allow for the *expansion* of recipes that provide starting places for invention.

Without such organization, our art will continue to stagnate, doing and doing over except in intermittent flourishing through the exceptional strength (genius) of the few rather than through *continuous* growth. Indeed, education itself, to a large extent, can be understood as the passing on of recipes in a wide variety of forms, the best ones we know so far, and the revision of and expansion of those available to us. If the purpose of education is not merely to acquire recipes, or even to acquire the “right” set (this narrowing to “proven” or “correct” knowledge), then recipes, how we organize information, materials and methods of our doing, cannot *prescribe* the actual doing. Because the future is unknown and the present rich with, wild with, diversity, *the significance of recipes is not in replication but in what can be made from them.*

When the focus of education turns to *replicating* recipes (that education researchers, with careful methods, extract or develop and then implant in schools through teacher development, policies or programs and then teachers apply to effectively implant knowledge, skills and attitudes in students), we lose sight of the thing itself: the obligation of teaching to offer students a loving enlargement of experiences from which they can make better living in the future. Instead of looking up and out, we look down to count, to tally, to measure and begin to think that our purpose for gathering more and better recipes is to follow them (or get others to follow them) with greater and greater accuracy and toward perfect execution. We come to think of recipes as steps for the manufacture of progressively perfected products, such that education becomes merely a means for that manufacture, even the manufacture of the students themselves, according to external criteria. Yet, as Dewey (1938) observes a century ago:

The applications of science which have produced in large measure the social conditions which now exist do not exhaust the possible field of their application. For so far science

has been applied more or less casually and under the influence of ends, such as private advantage and power, which are a heritage from the institutions of a prescientific age. (p. 81)

Arguably, in today's era of increased datification, marketization, and platformization of education (Jandric, 2020; Selwyn, et al., 2020; Bayne & Gallagher, 2021; Macgilchrist, 2021), such applications of science continue to an even greater degree.

Yet we can also bring to mind another kind of recipe: recipes as gifts of love offered to us from the long past or from a loving other. We take up those offered recipes to pass that love through the recipes and into our own lives and living, making with them something better than what we could make without them.

Think of your favourite recipe.

My mother makes heavenly pies. We are always debating which one we love best – apple or blackberry usually win, although some argue for pumpkin or lemon (oh, the golden meringue!) and on some nostalgic evenings, I long for a slice of raisin pie. The key, though, is the buttery crust.

Or perhaps not. I remember hiking up dusty trails, the hot smell of blackberries carried on the song of crickets, my fingers purpled, picking for pies. Then sitting in the kitchen watching my mother roll the dough into a circle, lifting it gently into the pie plate, and my favourite part, cleanly cutting the edges, for the scraps were mine to shape into my own little pie. Then more rolling and the top layer gently folded over the sugared berries, the patterned slits, the crimped edges and into the oven until golden, the butter and berry fragrance mingled.

Loved recipes hold space for – and open space into – a multitude of experiences.

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My mother gave me the recipe and I gift it to you. A cup of shortening. A quarter cup of butter at least. Three cups of flour or so. Enough water so that it feels right.

This “feeling right” is difficult to put in the hands of another but knowing that it is there shifts our understanding of making. We are *involved*.

When I asked her to give me more accurate measures, she said it depended on the temperature of the day, of the materials, your hands, the ingredients. But too much flour or handling and the dough is tough, too little and it sticks to the rolling pin. It is possible, of course, to ensure that there is complete consistency in all measures, temperature, handling by using machines to reproduce pies. We can *buy* a pie.

Over time we forget that making is not merely for consumption and perfect execution is not the purpose.

We begin to think that it is better to follow more accurate recipes than to risk making. There are two greater risks, however: as our efforts become mechanical, we miss the ineffable that makes the recipe beautiful and we eliminate growth from the making, that is, the possibility to make something new (and to remake ourselves in making): we reproduce only. After a time, we forget why we are making and simply follow the recipe as if accuracy of execution and ease of use are what we desire. Or we stop making entirely and accept the manufactured as better than what we can make ourselves.

When we think of education as production and consumption, we begin to believe, for example, that an efficient and effective computer program for phonics acquisition, now capable of personalizing for each student's targeted needs, produces lessons better than a human who inevitably makes errors, whose making is often flawed, and even, on some days, fails entirely.

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But what is made in the making together cannot be reproduced and to lose it is to lose everything that makes education.

Methods, that is, the procedures for production of knowledge in a teachers' science must be re-imagined as living processes, so that knowledge made is made for making with rather than "ready-made" to acquire and use. Indeed, a living (loving) method for generation rather than replication, John Caputo (1987) argues, is "the suppleness by which thinking is able to pursue the matter at hand...a way of keeping underway, in motion, even when it seems there is no way to go" (p. 213).

The methods of a teachers' science, developed out of and in alignment with the agreed-to ideas (at present working ideas) drawn from the responsibilities of love are living processes, patterns rather than prescriptions for exploration and experimentation in "the potentialities inherent in experience" (Dewey, 1938, P 86). Again, the thing itself is not the method, nor is it the knowledge produced; both are instrumental only in loving growth toward grownupness. In such methods that develop in making rather than to make precisely and efficiently as prescribed, there is risk of failure and a need to revise ongoingly in process, that is, for further inventiveness, but, indeed, this is the very cycle of growth. The greater risk exists in atrophy, not only lack of growth, but diminishment of present potential and future possibilities.

When we consider what the "wisest and best parent" (Dewey, 1915, p. 3) wants for their child, it can feel of first significance that children are entirely safe and always happy,⁴³ yet growth is thus thwarted, and the responsibilities of love are not fulfilled. Growth demands that children fail, fall, tumble, right themselves, try again, stretch, try new things, find things they excel at, do hard things, and achieve them, so they will try even harder things, to find joy and

⁴³ Although how their safety and happiness is made possible is different for different parents, the intention, because it demands imposition or enclosure, remains at odds with their learning growth.

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pleasure in the effort that leads to growth. Nonetheless, guardrails are necessary to protect children *from* school – from the caprice of any one teacher or persuasion from those focused on their own interests rather than on the education of the child. We all (wise or not) want to ensure that those in charge of our children are both competent and caring and above all, accountable to the interests of our children – and are *interested* in our children. As Simone Weil (1977) says, “‘You do not interest me.’ No [one] can say these words to another without committing a cruelty and offending against justice” (p. 313). There can be no love, certainly, without interest. What is necessary to imagine, however, is not more regulation and prescribed recipes, which leach out what matters, but to imagine ways for more participation, and methods that allow fruitful interaction with children and teachers in their communities to co-create loving living experiences.

Schools have not been designed for such interaction, however, but for imposition. The inception of public education in Canada – in BC, only a century and a half in making, was conceived as a tool to instill the values, in the west, at least, of British overseers, to *prepare* (working class) settler children to become a ready human resource for future economic growth (Carleton, 2022) and “to solve a wide variety of problems ranging from crime to poverty, and from idleness to vagrancy” (Gaffield, 2013, sec. 5, para. 7). This is the case, too, for the inception of Indian Schools, which, Egerton Ryerson (1847) argued, would “make the Indian a sober and industrious man” (p. 73). The direction of education was from the superior (who exemplified and defined the gold standard) to the inferior (who are unlikely to achieve superiority but could, nonetheless, be *improved*). From the future, the “obnoxious consequences” (Dewey, 1929a, p.34) are legion and seem only overwhelmingly unloving. Nonetheless, a collective growing up of education was made possible through the inception of public schools.

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Books, blackboards, worksheets, common curriculum, bureaucratic oversight and organization, credentialing of teachers in pedagogical methods allowed a growing access to education, however faulty, limited or even, in far too many cases, egregious, opened a space for the growing of its own growing and the widening circle of those who “know better” and therefore have a say to call into question what was never questioned before. Indeed, rather than attempting to distance ourselves from our past, we need to attend more carefully to the losses, Jane Palmer (2014) argues, to find ways to “identify the ragged pieces that emerge from difficult histories” (p. 3) and to connect them to our imagining of other futures. In the lives told, those of my father, my brother, all the women in my family before me, the students I have taught, the teachers I have worked with, the countless stories of opportunities once here and now lost, it is possible to find “shards of beauty” in poet Lorna Crozier’s (2018, personal communication) beautiful phrase, that hurt or heal (one is impossible without the other) and with which we might “put things back together in a different way” (Carter, 2004, as quoted in Palmer, 2014, p. 7) for other futures. As James Baldwin (1963) points out, “To accept one’s past – one’s history – is not the same thing as drowning in it; it is learning how to use it” (pp. 89-90).

The very act of growing up is to see up and out beyond the narrow confines of what seems the way it is toward what is desirable not only in our own lives, but for those, too, living with us. If we imagine our past, not as something to “correct” but what we must make anew with, then our educational institutions, which are a *source* for our growing up, to afford grownupness must ongoingly grow up, too. It is not necessary to continue in the direction begun by our past; we can “inherit from it in another way” (Stengers, 2011, p. 14). It is possible for education to grow up and out of a narrow sense that it knows best into more open, more enriching, widening forms of loving experience for all children. Education, after all, Dewey

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(1929b) argues, “is by its nature an endless circle or spiral” (p. 77): “In its very process it sets more problems to be further studied, which then react into the educative process to change it still further, and thus demand more thought, more science, and so on, in everlasting sequence” (p. 77). The methods, bureaucracy and technologies that have developed public education can be revised with today’s wider understandings and new technologies, not least digital spaces and instant global communication, to make a more beautiful education for every child if we agree that is our intention. Anything less, however, is not only “narrow and unlovely,” but, as Dewey (1915) adds, “destructive of democracy” (p. 3).

Methods used to ensure reproduction toward pre-approved ends thwart the growth and growing up of our schools. So the schools, so the teachers. So the teachers, so the children. Yet it is possible to imagine ways to guide without imposition. The guardrail for a teachers’ science, over and above whatever internal methods already used by the range of sciences it draws from, is two-fold: the responsibilities of love and ongoing revision in conversation at its vital source. Its methods, therefore, remain open to improvisation with teachers, students, experience, materials at hand, other knowledges – a wider participation and multiplication of voices that provide the checks and balances that ensure attention to the interests of children.⁴⁴

What is more, in any method chosen, the end and evaluation of both our art and our science are educational: the experiences engender a desire to go on learning. In other words, the value of any method, let us say, for learning the multiplication table, cannot be judged by the test results conducted after the experience. If, from that experience or series of experiences, the

⁴⁴ All living systems, Neil Theise (2023) notes, are homeostatic, but because “life is ceaseless movement, stability is found in balance, not rigidity” (p. 31). Indeed, what is required for homeostasis is randomness – unpredictability – which he notes, is “the source of all the extraordinary capacities for unbridled creativity in complex systems” (p. 34) while “a robustness of communication networks sufficient to produce balance even as the complex systems move to explore new, unpredictable possibilities” (p. 36). When we strive to eliminate what is unpredictable and to control communication, we make rigid (mechanical) rather than balanced (living) systems.

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student learns the multiplication tables through a given method but at the same time learns to hate math and turns away from numbers at every opportunity, the “success” encoded by test results is empty. This is not to say that learning multiplication tables is not, in general, helpful for future ease and enjoyment of math but that the learning of them is not of first consequence. *The value is only evidenced by the desire of the child to continue learning and the methods used are only successful if this is the case.* Methods are ongoingly revised as the child grows and as the world around them alters. In other words, the methods do not confine the living but move with the living, acting as a guardrail beside and with to enable *wider* living rather than as an enclosure to limit it.

Indeed, as Celia Lury and Nina Wakeford (2012) argue in their inventory of inventive methods, “inventiveness is not intrinsic to methods; it is rather something that emerges in relation to the purposes to which they are put” (p. 2). To be living and loving, to engender in every child the desire to go on learning, the methods of teaching (both of its art and its science) are necessarily inventive – or, perhaps, more accurately, can be invented with. Whatever laws or facts science discovers do not, Dewey (1929b) says, yield rules of practice – and all education, he argues, is a mode of practice: “No conclusion of scientific research can be converted into an immediate rule of educational art. For there is no educational practice whatever which is not highly complex; that is to say, which does not contain many other conditions and factors than are included in the scientific finding” (p. 19). Instead, Dewey (1938) argues, science can provide “a *working pattern* of the way in which and the conditions under which experiences are used to lead ever onward and outward” (p. 88).

Thus, the kinds of recipes a teacher's science could offer must be both “fairly stable” (Dewey, 1916, p. 200) and “a way of keeping underway, in motion, even when it seems there is no

way to go” (Caputo, 1987, p. 213). What follows is a consideration of working patterns, devices as method, and communication for the vital and reciprocal relationship between a teachers’ science and teaching’s art that makes new making from what is (so far) known possible.

Methods as Working Patterns For the invention of a new science, the intention is not to reinvent science itself. Science, like poetry and teaching, is an ancient practice. *The intention is to reimagine the idea by which its purpose is fulfilled in education.* The purpose of science is to find things out by noticing patterns (different knowledges notice different patterns), constants or consistencies (so far) in the chaos of the living world that are as “scaffolding stretched across the flux” (Caputo, 1987, p. 257). Again, these patterns allow the accumulation of knowledges by building and inventing from and with them rather than always beginning from scratch. Thomas Kuhn (1996), for example, noticed a pattern that I am thinking with here: that “the successive transition from one paradigm to another via revolution is the usual developmental pattern of mature science” (p. 12). A paradigm, he adds, “is an accepted model or pattern” (p. 23). Before Newton a different pattern for science existed, he points out, freer, without set methods, a “pattern [that] is not unfamiliar in a number of creative fields today, nor is it incompatible with significant discovery and invention” (p. 13). Because that pattern is no longer accepted does not mean, Kuhn argues, that those who used it were not scientists but, he argued, “being able to take no common body of belief for granted, each writer...felt forced to build anew from its foundations” (p. 13). The paradigm of contemporary Western science⁴⁵ seeks to notice, extract, and then replicate patterns to solve problems; the more problems it can

⁴⁵ Kuhn’s analysis focused on Western science and my emphasis on his work is not meant to dismiss the many sciences of other cultures. Quite otherwise. Nor is my intention to prove that his analysis is correct. It is to make visible aspects of a dominant framework that impacts and, I think, undermines, beautiful teaching – and from which to imagine otherwise.

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solve, the more successful the pattern and, indeed, with each solution, the more fully articulated that pattern or paradigm becomes. However, the pattern is extracted from and understood and articulated outside of the flux of living. The challenge for the invention of a teachers' science is to develop a means to attend to living patterns to solve problems that prevent the flourishing of teaching's art, and to do so, not one problem at a time, but to organize patterns that better solve ongoing problems in order to allow for "steady and cumulative growth of intelligent, communicable insight and power of direction" (Dewey, 1929b, p.10). However, solutions offered, and problems solved by sciences (for example, psychology or sociology) are not educational, that is, they are not generated by and tested at its vital living source: a living test is always ongoing, not "done" after a certain number of trials; so, too, living problems. Indeed, "normal" science as described by Kuhn attempts to solve the problems of living by reducing its complexity – it is, as Jean-Marc Levy-Leblond (1994) argues, "reductionist in its very essence" (p. 214). Yet a new problem is produced by it, William James (1909) argues: "When you have broken the reality into concepts you never can reconstruct it in its wholeness" (p. 59). In other words, its methods can only understand what is no longer living, and its solutions, if applied, because they are inert, produce inertia. It is possible, of course, for sciences to draw conclusions from what is thus fixed in place, making calculations based on a supposition of unchanging or predicted changes and then extrapolate from that "what works" for teaching and learning. However, James says, "We cannot learn from them how life made itself go, or how it will make *itself go*" (p. 56). To make *oneself go* is the essence of grownupness and therefore of education.

Because the purpose of this dissertation is to invent *a model* for a teachers' science, but not to prescribe its production – after all, to be living a teachers' science can only be made in the making – examples are helpful, not as exemplars to take up but as possibilities to dream from.

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One such example of living patterns is from architect Christopher Alexander. He argues that things built that do not grow out of the living conditions and with the living are dead, dropped into place from plans made elsewhere. We can draw an analogy to the “dead, specialized work” (Dewey, 2003, LW.3.10) of researchers from elsewhere that are dropped into classrooms.

Alexander argues that such a built world does not nurture the living and indeed is damaging to it. Yet it is possible, he says, to generate nurturing structures by putting the decisions in the hands of those who will live in them. This, too, aligns with Dewey's reorientation for an educational science. Alexander proposes that there must be an emphasis on wholeness, which begins at the center – the vital source – and grows out from it, that is, in livingness, rather than dissected parts. The purpose of such living structures, he says, is to make human life better (and better living, he adds, cannot be achieved without the better living of all that lives). He and his colleagues developed a pattern language, patterns for making good buildings that remain living: “Each pattern describes a problem which occurs over and over again in our environment, and then describes the core of the solution to that problem, in such a way that you can use this solution a million times over, without ever doing it the same way twice” (Alexander, Ishikawa & Silverstein, 1977, p. x). This noticing of patterns is echoed in mathematics and expressed in the form of an equation, which Whitehead (1929a) notes “will serve for a hundred other problems” (p.53). To maintain the capacity for inventiveness (livingness), unlike the pattern of science described by Kuhn (1996), with its “preformed and relatively inflexible box” (p. 24), a living pattern, Alexander (1979) says, “must remain open enough to become empirically vulnerable” (p. 268) rather than invincible. It is, after all, he says, an *attempt* in a world of flux “to define an invariant but only ever an attempt” (p. 269), and the purpose is not to close the pattern but to ensure that it can become of use for better living and helpful as a starting point for action in a

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world of flux where possibilities are vast. “Pattern,” as researcher Paul Stenner (2012) puts it, “is a unification of multiplicities” (p.137) that is understood through contrast by its dispersal - like flocks of birds and schools of fish – or patterns of foraging and return to home.

In the case of education, the pattern is not spatial and therefore more difficult to discern. A social pattern can be understood as a habit, which Dewey (1922) describes as “an acquired predisposition to ways or modes of response” (p. 42). Indeed, I began with dispositions or habits of response necessary for this invention, as constraints that love makes. Without shifting the way we respond *first*, new patterns cannot become visible to us. We can only repeat old patterns. The habit of conventional science to view reason as “a coherent and explicit chain” (Feuer, Towne & Shavelson, 2002, p. 7), for example, this “voice of reason” that Ursula Le Guin (1986) argued should be “spanked and stood in the corner” (para. 5), must be reconsidered. To be in synchrony with a practice of love, science must develop a habit of reasoning in the John Caputo (1987) describes it: “to respond to things, to keep up a correspondence with them” (p. 228).⁴⁶

A useful pattern for teaching that a teachers’ science would seek is a mode of responding that leads to more fruitful and creative experiences for students. That the pattern remains vulnerable to variation (invention) prevents the deadening effect of repetition through “specialization which if unchecked ends in thoughtless action” (p. Dewey, 1922, 153). Nonetheless, the more numerous, flexible, refined and “delicate” (Dewey, 1922, p.175) our acquired patterns/habits, the wider our capacity for attention, speculation, and imagining otherwise. Thus, a teachers’ science to fulfill its responsibilities to love, and drawing from

⁴⁶ When we imagine reasoning as a coherent and explicit chain, a step-by-step process that leads to a solution, it is plausible to believe that rapidly advancing generative AI can reason and even do much of the work of conventional research (Mollick, 2025). However, if reasoning is wider (and therefore, too, our research), if it is a living response, then AI is of limited (although valuable) assistance.

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experiences of teaching as well as a range of other knowledges, would develop an inventory of patterns – delicate, vulnerable, open – that generate possibilities, ways of responding, for more beautiful teaching.

As Dewey (1929b) points out, however, “Science does not emerge until these various findings are linked up together to form a relatively coherent system, that is, until they reciprocally confirm and illuminate one another, or until each gives the others added meaning” (p. 22). Wholeness, in other words. The idea that each finding illuminates and adds is one of living order: “order is not imposed from without but is made out of the relations of harmonious interactions that energies bear to one another. Because it is active...order itself develops” (Dewey, 1934, p.14). That order is made within “a labyrinth of linkages,”⁴⁷ and from, Alexander (1974/2023) says, “literally millions of almost infinitesimal acts” (p. 249).⁴⁸

Patterns of practice, the very patterns that distinguish it from other practices and discerned by its particular attention, are always becoming. They are not stamps that replicate. Yet unless we attend to the patterns made, they are made for us, and our actions in following them are complicit in the movement away from the direction of dreams. In education, our loving attention seeks always better living in the future through actions (including reparations and revisions) in the present. Better living is expansive, not only in what might become possible, but also for whom.

⁴⁷ Tolstoy uses this phrase in a letter about *Anna Karenina* in which, he was led by a “a need to combine ideas linked together by their expression. But each idea expressed separately loses its meaning and becomes terribly degraded if apart from that linkage to which it belongs.” Critics, he argues, to be useful, cannot tell the meaning, which cannot be understood through explanation, but only through leading readers “through the endless labyrinth of linkages” (quoted in Browning, 2010, p. 18). Facts, deprived of living linkages, quickly degrade, too, I think.

⁴⁸ Attention to the order our *acts* make is essential. It is also through such “millions of infinitesimal acts,” after all, that racism, for example, is sustained.

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While one child is not served (lovingly, beautifully) by education, none of our children are served now and into the future. It is *intolerable* to us: we *act*.

The patterns that we accumulate make a loving direction – which is the way of justice – visible to us. Can you imagine if all our ingenuity, our resourcefulness, and our imaginative capacity were bent on this accumulation?

Devices as Method The weight of methods in conventional educational research cannot be underestimated. I have spent years trying to reconcile the requirement for an accepted research method with finding ways to make beautiful teaching possible and have come to see them as incompatible, hence this speculative invention. Yet if science itself can be described, as Richard Feynman (1998) says, as “a special method of finding things out,” then method must be carefully reimagined rather than ignored. Method, perhaps, needs to be understood in two ways. Feynman description might be better understood as the paradigm, itself, what Kuhn (1996) describes as “the entire constellation of beliefs, values, techniques, and so on shared by the member of a given community” (p. 175). However, Kuhn also distinguishes a second way of understanding a paradigm, that is, not the thing itself, but the *nature* of it in a developed or “normal” science which is “the consequence of the acquisition of a paradigm that identifies challenging puzzles, supplies clues to their solution, and guarantees that the truly clever practitioner will succeed” (p. 179). To imagine different *consequences*, it is necessary not only to imagine a different constellation (in my case, one that love makes) but also the different puzzles (what is puzzling when a focus is on minimizing suffering and maximizing options), different clues, and therefore the different solutions that are made possible. If one continues to solve problems as identified by the old paradigm, new things found out are subsumed within it. So, in the case of the “know better” model that I am trying to unlearn – now that we know new things,

they can be bundled for transmission and application. But it is possible to imagine doing things differently with new things found out.

In thinking about education, Dewey argues (1929b) that the value of the laws and facts proffered by science “consists in provision of *intellectual* instrumentalities to be used by the educator” (p.28). These instrumentalities or “intellectual tools” or *devices* are significant in that they “direct [teachers’] attention, in both observation and reflection, to conditions and relationships which would otherwise escape [them]” (p. 30). This is very different from an understanding of method – both as used by education researchers and as developed by them for use in practice – as a recipe to be followed with fidelity (Doll, 2012; St. Pierre, 2019; Weaver & Snaza, 2017). In inventive fields – and education, as I have argued, is inventive – Estalella and Sánchez Criado (2023) argue that conventional methods demand “a framework that suffocates and invisibilizes any trace of creativity” (p. 2). Instead, they suggest envisioning methods as devices that are “modes of patterning the social, devised to gather data, produce knowledge, and articulate questions” (p. 5). Devices, however, are not prescribed methods but “provisional arrangements that result not from polished design but from tinkering practices” (p. 5).

In other words, a teachers’ science, in offering its new things found out, would not provide set procedures or programs to follow but devices that bring attention to patterns – or themselves are a mode of patterning – for educational growth and grownupness. Devices can be material and social (Law & Rupert, 2013) and although they are – or can be – reusable and repeatable, a device, unlike standard techniques and methodologies are improvised *from* the field (in and with teaching practice) and therefore “unstable, provisional and situated” (Estalella & Sanchez Criado, 2023, p. 9). In other words, like (or for) the patterns Christopher Alexander describes, they are vulnerable and delicate rather than impregnable and invincible. Significantly,

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unlike an accepted research or teaching method, a device is always made or adapted for a *particular purpose*. In the case of teaching, for both its science and its art, the devices devise, through direction of attention, movement toward the dispositions and conditions of loving practice. With them we become aware of and attentive to questions we did not have and patterns we might not otherwise see. Because devices develop from and work within practice, they start in the midst of what is already underway. “Starting in the middle,” researcher Debbie Lisle (2021) notes, “means a more careful, speculative and provisional mode of questioning that inhabits entanglement” (p.437). Devices, emerging from – and entangled with – the experiences of teaching, are organized by a teachers’ science and tested, revised, and refined – tinkered with – in practice.

A helpful example can be taken from art (and teaching, of course, is an art). Literary theorist Viktor Shklovsky (2016/1917) describes how the devices of art (or as art) serve the goal of art:

The goal of art is to create the sensation of seeing, and not merely recognizing, things; the device of art is the “estrangement” of things and the complication of the form, which increases the duration and complexity of perception, as the process of perception is, in art, an end in itself and must be prolonged. Art is the means to live through the making of a thing; what has been made does not matter in art. (p. 162)

In other words, because art depends on our *involvement*, our *perceiving*, any device that is or becomes calculative it is no longer of use: when we “take things in by counting and spatializing them, we do not see them...A thing passes as if packaged,” (p. 161). Although in so automatizing a thing, we “save the greatest amount of perceptual effort” (p. 162), since the thing is known by a single feature (children by an intelligence quotient, for example), it is contrary to

the *goal* of art. Thus, just as specialization and replication deadens the inventive capacity of patterns, to the extent that a device automatizes, it has reached the limit of its use. In thinking about the possibility of a theory for the device of rhythm, which distorts the prosaic in a way that provokes and prolongs attention, Shklovsky (1917/2016) observes: “It seems probable that such systematization will not succeed, for we are talking not of complicating but of disrupting the rhythm, of disrupting it unpredictably; if such a disruption is canonized, it will lose its power as a device of deceleration” (p. 173).

Education is a work of art, the difficult “art of the utilization of knowledge” (Whitehead, 1929a, p. 4). It cannot be made efficient. As soon as its methods are efficient, neither the teacher nor the learner is involved: they are automata. Love, longing, difficulty, striving evaporate. What remains is a hurry to get done, to take up a nugget or pepper-corn of truth, a certificate, a gold star and to go on as before – untouched. When we simply follow a well-worn or well-lit or well-mapped path, when we take directions from our *devices*, we are as automata; we do not think. To think, Dewey (1910) says, “involves a jump, a leap, a going beyond what is surely known to something else” (p.26). It is an adventure, a risk, a leap from the known. In this sense, a thought ... is creative—an incursion into the novel. It involves some inventiveness” (Dewey, 1916, p. 77). Knowledge, on the other hand, is dead, inert, as Whitehead (1929a) argues, and has limited use for learning: “Knowledge does not keep any better than fish...somehow it must come to the students, as it were, just drawn out of the sea and with the freshness of its immediate importance” (p. 98). Indeed, he argues, we gather in schools and universities not merely to “pass on” knowledge (the best recipes so far), but to preserve

the connection between knowledge and a zest of life, by uniting the young and the old in the imaginative consideration of learning...This atmosphere of excitement, arising from

imaginative consideration, transforms knowledge. A fact is no longer a bare fact: it is invested with all its possibilities. It is no longer a burden on the memory: it is energizing as the poet of our dreams, and as the architect of our purposes” (p. 93).

Imagination, Whitehead argues, which is, he says, is “a way of living, and is not an article of commerce” (p. 97) is a “dangerous gift, which has started many a conflagration” (p. 101).

The devices devised or organized by a teacher's science do not optimize or automatize – and might not be used as expected by their inventors; they are dangerous, awakening a desire to go on learning, that is, to go on learning *beyond* what already is, even to disobey. Indeed, thinking “puts some portion of an apparently stable world in peril and no one can wholly predict what will emerge in its place” (Dewey, 1929a, p. 222). The devices of teaching, in their very instability and provisionality can provoke, interrupt, disrupt. If they can only be used according to directions, they are inert and of little use in/as living methods – or for creating other futures.

Communication for Loving Methods In the “father tongue” (Le Guin, 1986) communication goes one way. The one communicating is “master explicator,” as Jacques Rancière (1991) puts it, and therefore knows more and better; the concern of the explicator is to package this knowledge in palatable ways for consumption so that those who are told can come to know and do what they are told. There is no partnership. This form of communication assumes a *passive* listener who can absorb information as transmitted and then apply it as prescribed or a recalcitrant listener who must be *persuaded* to accept the information in order to take up what is “good for them.”⁴⁹

⁴⁹ Arguably, if they are persuaded, they are persuaded to do, not what is in their own interest, but in the interest of those who are communicating. In today's communicative capitalism, Jodi Dean (2014) argues, “democratic rhetorics of access, transparency, voice, discussion, reflection, and participation strengthen the hold of capitalism in networked societies” (p. 148): we are persuaded to think we are “participating” as we consume. The *interest* of such communication is not in the interest of better living for our children in the future.

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Dewey (1929a) defines communication differently, not as an expression of the already thought, but “the establishment of cooperation in an activity in which there are partners, and in which the activity of each is modified and regulated by the partnership” (p.179). In other words, ideas come *from* communication rather than existing prior to communication. Such communication is not a device of transmission but of creation, reconsideration, revision; its fruits, Dewey says, are “most wonderful” (p. 166): participation and sharing. It is what I have described as “kitchen table” conversation – beside and with, leaning in, listening, trustful, and in the mother tongue, which is not understood only in the exchange of the words themselves but by its intention which is to turn together, to bind, to connect, and in the case of educational communication, to think together (inquire, learn, study, speculate) in our common concern for the children whom we love.

In conventional science, however, each specialized group develops its own specialized vocabulary for its framework of methods, standards, and evaluations; the framework begins with agreement and a seat at the table of its conversation is only available to those who *already agree* to its main assumptions and accept its methods, standards and evaluation. For living processes, however, coherence depends on both wholeness – “no element there cuts itself off from any other element, as concepts cut themselves from concepts” (James, 1909, p. 54) – and direction – the movement of many elements in relationship.⁵⁰ As Dewey (1929b) remarks,

There is no subject-matter intrinsically marked off, earmarked so to say, as the content of educational science. Any methods and any facts and principles from any subject

⁵⁰ Science, itself, is increasingly making evident the processes of our connections to the whole. At the cellular and molecular level, “each of us is in perpetual, direct continuity with the entire biomass of the planet” (Theise, 2023, p. 67).

whatsoever that enable the problems of administration and instruction to be dealt with in a bettered way are pertinent. (p. 48)

Thus, for a teachers' science, communication cannot be limited to speaking within the shortcuts available within a given constellation of agreed-to prior knowledge and beliefs. Yet the difficulty raised by multiple perspectives, each "constrained by diverging attachments" (Stengers, 2005, p. 193), is not a problem to be solved by making easy (and exclusion is easiest – a solution of specialization in conventional science); the difficulty, like the difficulties of teaching and learning, in fact, is desirable. The multiplicity of perspectives and standpoints is what makes revision toward bettered ways and therefore growth possible. The purpose of our partnerships is not that we all speak the same (specialized) language, but that we seek (often fleeting, always reshaping) patterns of (loving) possibility that move in the direction of growth and grownupness. It demands that each of us is aware of our limitations in seeing the whole. We are not in partnership to *explain* to one another so we can come to an agreement. Indeed, a demand for agreement keeps us (imprisons us) in the same framework of thought, either adding links to chains of proof or seeking to prove our points *against* the other rather than considering what we can make otherwise together. What is necessary for acting from our thinking together, Debaise and Stengers (2022) argue, is consent, which "is not passive agreement but a both willful and transformative acceptance" (p. 408) and only possible if each set aside their claim to be the right one. They add, "If an agreement is obtained, it will be an event that belongs to no one but may be received with gratitude, because it will have been generated with others, because of others, and at the risk of other" (p. 410).

In our everyday living, incommensurability between various perspectives, frameworks, and languages is commonplace, not only with spouses, neighbours, colleagues, and beyond, our

global living together today, but, too, since time immemorial, even when movement between communities was arduous or even impossible, because many cultures routinely invite the other-than-human to join their conversations. Researcher Marisol de la Cadena (2015), in telling about her relationship with Nazario Turpo and his father, “both Andean peasants and much more” (xv), who invite the community’s highest mountain and its relatives to participate in their conversations, writes:

Our worlds were not necessarily commensurable, *but* this did not mean we could not communicate. Indeed, we could, insofar as I accepted that I was going to leave something behind, as with any translation – or even better, that our mutual understanding was also going to be full of gaps that would be different for each of us, and would constantly show up, interrupting but not preventing our communication. (p. xxv)

These gaps both keep us alive to and participating in the conversation. They provoke and prolong our attention to each other. They are also gaps through which the otherwise might appear to us, however fleetingly, and from which, as Heidegger (1998) puts it, we might be able to “say the world anew ... to bring what is not-yet-seen into appearance” (p. 142).

Schools, at least the schools I have been in all these many years, do not routinely engage in communication for partnerships, and yet, love, which nurtures growth (hooks, 2001) cannot thrive otherwise: it is a *practice* of partnership. And the education of our children cannot do without love. At least, not beautifully.

There is nothing new about methods or processes for thinking together about a common concern through communication. In an interview, researcher Fred Moten responds to what the word “study” means in his work with Stefano Harney:

When I think about the way we were using the term ‘study,’ I think we were committed to the idea that study is what you do with other people. It’s talking and walking around with other people, working, dancing, suffering, some irreducible convergence of all three, held under the name of speculative practice. The notion of a rehearsal – being in a kind of workshop, playing in a band, in a jam session, or old men sitting on a porch, or people working together in a factory – there are these various modes of activity. The point of calling it ‘study’ is to mark that the incessant and irreversible intellectuality of these activities was already there. These activities aren’t ennobled by the fact that we now say, ‘oh, if you did these things in a certain way, you could be said to have been studying.’ To do these things is to be involved in a kind of common intellectual practice. What’s important is to recognize that that has been the case – because that recognition allows you to access a whole, varied, alternative history of thought. (Harney, Moten & Shukaitis, 2012, para. 3)

The communication necessary for what I have imagined as kitchen table methods (where we can take up – study – questions that are of common concern) is not something that needs to be explicated or something for which we do not already have tools.

What is important to communication for partnerships is that our methods do not *prevent* participation and, indeed, that it provides a check against what Tyson Yunkaporta (2020) from the Apalech clan in Queensland, Australia, calls the source of all human misery and “the most destructive idea in existence: I am greater than you; you are less than me” (p. 26).

Constraints of living methods

Methods, however, even living methods for loving purposes, impose constraints: they are a way of ordering, and that ordering is a constraint. Indeed, methods, because they install

habitual ways of doing things, are as dangerous as they are necessary. We risk doing and doing over and over again (Dewey, 2003, LW.3.10) rather than growing with and into changing worlds. Yet a living order, made in making, ongoingly revised by those who use it, grows from, with, and out of the constraints, which act as a springboard rather than an enclosure. As such, over and above the constraints of love, for the invention of a teachers' science, it is necessary to understand the constraints of *living* methods.

Negative Capability As soon as a method (order) is fixed, it is no longer living. For living order, negative capability, defined by the poet John Keats (1817) as when one is “capable of being in uncertainties, Mysteries, doubts, without any irritable reaching after fact & reason” (n.p.) is necessary. It is, as Margaret Wheatley (2002) puts it, a “willingness to be disturbed” (p. 34). To accept order as provisional, as open always to revision, to order in order to communicate *with* rather than *to* others, demands “a learned unknowing, a suspension of judgments” (Serres, 1995, p. 90) so one may listen for what is not yet known or even yet perceived. When an answer derived from a method is deemed correct – and therefore no longer open to revision – all other answers are excluded and all questions for which the answer cannot respond are ignored. Such order, disconnected from those who are ordered, becomes, as Gadamer (1965/1992) argues, an end in itself and its aspiration, smooth functioning.

If we imagine a different end for our ordering – the desire to go on learning what is desirable to learn – then our methods are only ordered in so far as we can make *with* them. We who are free to think, rather than captives of orders are subject to “doubting, inquiring, suspense, creating and cultivating of tentative hypotheses, trials or experimentings that are unguaranteed and that involve risks of waste, loss, and error” (Dewey, 1929a, 222). This is not *disorder*, however, nor is it what Isabelle Stengers (2018) calls the “organized doubt” (p. 22), for example,

of climate change deniers. It is, rather, probing, pulsing, inventing, moving, living, *making* that keeps the methods alive.⁵¹ It is to hold a deep awareness that, as Whitehead (1938) says, “we can know anything in some of its perspectives. But the totality of perspectives involves an infinitude beyond finite knowledge” (p. 59). In other words, the constraint of wholeness (a *condition* of living) demands the capacity, which is a constraint to living methods, to each accept our own limitations as a *springboard* for growth together.

Slow & Sudden To imagine organization otherwise, that answers are only provisional, Stengers (2018) argues in her consideration of another science, the essential thing is to “put what are instead often difficult choices on the table, necessitating a process of hesitation, concentration and attentive scrutiny” (p. 3-4). Yet this necessity conflicts with an idea of order as the smooth functioning of a well-oiled machine where everything is streamlined for ease and speed, such that it becomes acceptable, even preferable, “to extract the thing to be studied and transplant it into a milieu defined by the scientist’s questions” (Stengers, 2018, p. 62). Such questions must be *answerable*: “clear, limited, bounded and narrow” (Cohen et al., 2017, p. 113) and sufficiently manageable to efficiently produce “deliverables.” For efficiency’s sake, too, Stengers adds, there is also “a radical reduction in the number of protagonists allowed to assess the ‘value’ of scientific propositions” (p. 74). Specialized language develops as a shortcut for the few trained to transmit information so mined for questions so framed.

Exclusions proliferate.

Possibilities narrow.

⁵¹ In complexity theory this is often referred to as *quenched disorder*. The just-right amount of randomness – which is the source of the creativity – and “a robustness of communication networks sufficient to produce balance even as the complex systems move to explore new, unpredictable possibilities” (Theise, 2023, p. 36).

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What “slow” advocate Carl Honore (2004) calls *tangled* questions are ignored: they either impede speedy progress or cannot be speedily resolved, or, indeed, resolved at all. Our questions of *living* practices, always tangled, are thus swept under carpets as if they are not important.

Stengers (2018) describes slow science as “the demanding operation that would reclaim the art of dealing with, and learning from, what scientists too often consider messy” (p. 120). This messiness, however, “is nothing other than the irreducible and always embedded interplay of processes, practices, experiences, and ways of knowing and valuing that make up our common world” (P. 120) – in other words, livingness. Her words echo Dewey’s (1929b) description of an educational science. Like Dewey, Stengers, too, argues for “the capacity of those concerned to formulate what matters to them, what an evaluation should take into account, and what would constitute an acceptable ‘convention’” (p. 76) such that knowledge “would not be an authority but a resource” (p. 76). What Stengers calls “fast science” is able to “progress” rapidly, as Kuhn’s (1996) analysis, too, describes, only by isolating itself from the messiness of living and by asking, answering and evaluating its own questions. But in ignoring the messiness, Stengers argues, “we discover that we have messed up our world” (p. 120).

A teachers’ science that thinks *with* teachers must be constrained by slowness and difficulty rather than speed and ease. Again, the difficulties are not to be eradicated, overcome, smoothed over. Instead, Stengers (2018) argues, “the capacity of each protagonist to present what matters for them is important, and where each will know that what they may learn from the others will always be understood as a response to a question that matters for them” (p. 79). This is a democratic process – and a teachers’ science is necessarily democratic if it is loving – which demands, as Dewey (2003) argues, that “every individual must be consulted in such a way,

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actively not passively, that [they themselves] becomes a part of the process of authority” (LW.13.295). Difficulties, rather than something to be fixed, point to *significance*, what we must pay attention to. They create “an opening which demands a response yet never determines what that response shall be” (Savransky, 2021, p. 6).

In other words, our teachers’ science, too, understands the desirability of difficulties, of slowing to consider them together not to *oppose* one another or even to find (manufacture) agreement together but with an awareness of resistance that “calls out thought” and thereby “generates curiosity and solicitous care” (Dewey, 1934, p. 60).

Slow time is living rather than mechanical. It does not tick with uniform beats in tidy progression, in other words, our *measurement* of time. Such a narrow perspective misses time marked by bird flight, salmon runs, leaves, soil, births, deaths, the taste of a madeleine dipped in tea spiraling into the past, or the suddenness of slow: long periods of dormancy and then – the moment after interminable waiting when nothing happens – movement. What seemed impossible, even unimaginable, is suddenly possible (Buck-Morss, 2010).

Mechanical time, on the other hand, is separate from experience, and we must keep pace with it. Time, as the saying goes, is money and to waste time is iniquitous. Living time (which can stretch across centuries, leap into the future, become light) exists only *in* the interactions of a living world. In Virginia Woolf’s (1931) novel, *The Waves*, a character protests the tyranny of time that is “the little compartments of one’s engagement book with dinner at eight; luncheon at one-thirty” (p.181):

It is a mistake, this extreme precision, this orderly and military progress; a convenience, a lie. There is always deep below it, even when we arrive punctually at the appointed time with our white waistcoats and polite formalities, a rushing stream of broken dreams,

nursery rhymes, street cries, half-finished sentences and sight – elm trees, willow trees, gardeners sweeping, women writing – that rise and sink. (p. 181)

In living methods, *time exists in the experience itself* and its movement, rising and sinking, moves with what is mattering. A teachers' science, gathering with all those with a living concern, must accept – even introduce – the complications and interruptions that slow things down – a different process entirely than reduction for extraction. Yet the way to “light, justice and dignity,” (para. 27) poet Pablo Neruda (1971) says, and surely this is the bettered way we dream of for our children, despite our sense of urgency to get things right, demands from us not efficiency which leads us astray, but a “burning patience” (para. 25).

Intimacy & Vulnerability Perhaps the constraint of loving (living) methods most difficult to imagine for science is the need for intimacy.⁵² Intimacy is reciprocal; it cannot exist otherwise. In one of the many apocryphal stories (or readings of stories) about Socrates, he says, “I cannot teach him; he does not love me.” Love demands mutual vulnerability that “care,” a word frequently used in teaching, often does not require.⁵³ Indeed, very often care is offered to those who are “less than” or do not “know better.” The “caring” professions care by “improving”

⁵² Through complexity theory, the idea of intimacy is becoming more easily coupled with science. Theise (2023) reminds us that in living, “We are not walking through the world: we are interwoven in it” (p. 24). It can “awaken us to our true, deep intimacy with the larger whole” (p. 6). We are, as William James (1907/1981) argues, both one and many, an idea confirmed by quantum theory where light is both a wave *and* a particle and you and I are both individual and, at the cellular and molecular level, “intimately connected to everyone and everything” (Theise, 2023, p. 28).

⁵³ I am using the word care in its everyday use in schools rather than of feminist care research, which thinks care as “inseparably a vital affective state, an ethical obligation and a practical labour” (Puig de la Bellacasa, 2012, p. 197). This is love, I think, but Puig de la Bellacasa (2012) objects that “appealing to love is particularly tricky: romantic idealizations of love are not rare, just as the nastiness accomplished in love’s name is plentiful” (p. 204). Yet as Krista Tippet (2008) points out in an interview with poet John O’Donahue, “Important words get watered down and almost ruined, and yet we still need them. And ‘love’ is one of those words” (18:45). We cannot, therefore, abandon them. In this case, in thinking about love first as the love of a parent for their child and teaching as *in loco parentis*, care, I think, is insufficient, particularly in a “caring profession” where notions of care are deeply interwoven with an effort to fix, improve and solve *for* others. This is not to argue against care research - or indeed any research. It is a privilege to think *with* many others without the necessity of thinking within their frameworks.

the lives of those who are “less fortunate” in one way or another. Relationships are made to expedite or ease the path to improvement for “their own good.” Those who “care” do not need the care of those they care for. Carers can stand back, out, separate from and pass down their caring in the same way they pass down their knowledge.

Love, on the other hand, is risky. We are involved. We cannot set ourselves outside the experience – on the high ground above the fray – as an observer, a manipulator of results, a bystander innocent of whatever troubles we are solving, or in “the secure position of an enlightened outsider who knows better” (Puig de la Bellacasa, 2012, p. 197). Love, Thomas Merton (1979) says, “is not just something that happens to you: *it is a certain special way of being alive*” (p. 27), a way of living in wholeness where you can no longer compartmentalize your thoughts, desires and acts. Loving children is not a “strategy” for “improving” test scores, compliance, engagement. It is a way of being alive with them for better living now and in the future. We are involved not only *with* them but *in* what is troubling. What is troubling troubles us, too. Involvement (and love is always involved) requires a “we.” “We” is *made*, Stengers (2018) notes: “Relation-making does not consist simply in the recognition that we are related; it is an achievement. It implies the risk of failure, the hesitation between peace and war” (p. 146). Intimacy, which is necessary for love, to love, is slow, requiring reciprocal relations and participation together in matters of concern.

Yet the reciprocity of love does not demand that we each “get something” through a series of compromises and compensations about which we agree. As John Caputo (2000) notes, “Love is not an economic exchange in which I invest my love into someone with the expectation of gain or profit, of being compensated later on, at the point when my love will be rewarded” (p. 184). Education is not an “investment” in the future; education is our gift to our children, whom

we love. A teachers' science does not gather those with a concern for children to *agree* together. Instead, as Isabelle Stengers (2018) describes, "it is a matter of collective learning through the test of an encounter with dissenting voices around issues of common interest" (p. 100). What matters, she says, is "the possibility of creating relevant modes of togetherness between practices, both scientific and non-scientific; finding relevant ways of thinking together" (p. 145). This togetherness demands intimacy. We cannot stand back, step out, pass down, look down, but must step into the problem that is ours, too; we are none of us "an island entire of itself" (Donne, 1614/1974, p. 1215) but involved with each other "in an inescapable network of mutuality" (King, 1963/1977, p. 468). We are diminished by whatever diminishes another. Rather than reciprocity which has come to suggest an exchange of equal value, Debraise and Stengers (2022) suggest that between us are "mutualist bonds... binding heterogeneous beings who need each other but each for its own reasons" (p. 409).

Yet the difficulty of love (which demands intimacy) is desirable. Indeed, the very effort to make love easy diminishes the necessity for attention, for effort, for ongoingly making and renewing love and, in essence, becomes a kind of violence, since ease is always in the hands of those with the power to make ease or to be at ease. Tolstoy (1910), just months before his death, wrote a letter to Gandhi, who greatly admired him, about love which he describes as "the striving of [human] souls towards unity" (para. 2). He writes, "if the law of love cannot exist, therein remains no other law except that of violence, that is, the right of the mighty" (para.2). In love we make ourselves vulnerable to each other rather than building up our defenses to protect ourselves or as a wall behind which we can launch attacks. However, this is not the vulnerability created by monocultures that thins, impoverishes, makes fragile and susceptible to epidemics (Debaise & Stengers, 2022) but rather, as Debbie Lisle (2021) describes, "connotes porosity rather than

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smooth edges, openness rather than closure, permeable thresholds rather than hard borders” (p. 457). So understood, vulnerability, is not a “flaw to be divested, displaced and eradicated” (p. 458), but rather the weakness (the gap, the hesitation, the risk) that makes love possible.

I have emphasized the difficulty of love, not only because it is often considered “soft” next to the hard edges of calculations but because it is too often imagined as something that “happens” to us – or does not – or something instinctual like breathing, or a feeling, like anger. To *choose* love is a way of being alive that does not thrive in ease, speed, or safety – if by safety we mean guarantees against all risk. Indeed, as Tyson Yunkaporta (2020) argues, safety *relinquishes* choice: “There is no agency in safety, which places a person in a passive role, at the mercy of authorities who may or may not intervene when needed” (p. 209). Yet to choose the intimacy of love does not mean that we cannot look up and out from the experiences we are involved in to think together – which demands distance but not indifference. As Dewey (1929a) notes:

Actual experience is such a jumble that a degree of distance and detachment are a pre-requisite of vision in perspective. Thinkers often withdraw too far. But a withdrawal is necessary, unless they are to be deafened by the immediate clamor and blinded by the immediate glare of the scene. (p. 409)

Indeed, our very love demands that we can take a long look to make better choices for better living. In the current organization of teaching and its research, teaching is too close and research too far. However, if, by our common work together, each moving with the other to step, in so far as possible, into a different perspective, as William James (1899) suggests, we view “at two

different angles, - to get a stereoscopic view”⁵⁴ (p. 11), not only to move toward wholeness but so that each of us, from wherever we stand, can contribute to the possibilities we dream of and act otherwise for better living in futures for our children whom we love.

In the language of his ancestors, Richard Atleo (2011) says,

Yaa?akmis is the Nuu-chah-nulth word for “love,” and it is also the word for “pain.” It is the perfect word to reflect the polarity of existence and its potential unity – love on one side and pain on the other, with both merged into one experience.... Undeveloped, unmanaged, ungoverned, or unexamined love and pain remain separate and incomplete. (pp. 150-160)⁵⁵

We must grow up together into difficult love – which demands both intimacy and vulnerability – with each other and for our children as a necessary constraint on our living methods.

Organizing for Living Processes

Science, Richard Feynman (1995) says, also makes possible the actual doing of new things – which, he says, is its field of technology. Technology, thus understood, is between teaching's science, which finds things out, and its practice, which does things. It can be, for example, a funnel, an excavator and implanter, a bridge. The idea for the doing of new things

⁵⁴ This idea - going both forward to the 21st century and back to time immemorial - is echoed by Mi'kmaw Elder Albert Marshall (2005) in what he calls Two-Eyed Seeing or, in the Mi'kmaw language, *Etuaptmumk*. He argues, “Only when we see with two eyes, will Western science be something more than blind and Aboriginal thought something more than lost” (p. 3).

⁵⁵ Writer Freya India (2024) argues that risk aversion, that is, against potential pain in relationships, is a constant concern for Gen Z, fed by risk analysis, red flags, trigger warnings, safe spaces through multiple social media channels. They will not risk love which always merges with the risk of pain. And yet, risk is necessary for a full life, India argues, “Otherwise what's the alternative? Some soulless life of safety and consumption? Purging your own life of meaning because things might possibly go wrong? Sitting safely inside staring at screens, watching simulations of strangers live their lives? And staying anxious and alone and never seeing that as the ultimate risk? Never seeing that maybe the most dangerous life is one that demands nothing of you?” (para. 11).

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impacts what can be done. My concern is that the *imposition* of new things science finds out, with technology as an efficient way for their delivery, impedes beautiful (loving) teaching.

I am imagining, with this model, that technology makes, instead, a table for convening. At the center of concern is the teacher and student and everyone with a concern for them gathers to consent together on bettered ways to support the living (loving) work of teaching. This gathering is, in effect, the method of a teacher's science and it is *made actual* by technology that can cross time and space to make room for everyone who is concerned. And too, technology can make actual living organization of bettered ways that allow the development of teaching's art.

In thinking about the stagnation of teaching, Dewey (2003) was concerned not only that "much experience goes unrecorded and unutilized that might be rendered available for others" (MW.15.189) but that, because teachers are not given responsibility in the development of theories, those theories "do not get translated over into vital results because the teacher has not had share enough in building them up and contributing to them" (MW.15.189). Both practice and theory are thus impoverished. To bring them into "active union with each other" (p. 87), Dewey (1938) argues, an educational science must find a means of keeping track and recording "the significant features of a developing experience" (p. 87) and to "look back over what has been done so as to extract the net meanings, which are the capital stock for intelligent dealing with further experiences" (p. 87). Invention without stocktaking is neither fruitful nor sustainable.

In conventional science, textbooks and peer-reviewed research provide the starting ground for a researcher, that is, everything already known that has been verified by experts can be taken for granted – unless there is a revolution in which case, new textbooks must be written. In the arts, however, Kuhn (1996) points out, textbooks, "except compendia of or handbooks to original creations, have only a secondary role" (p. 165). Art, he says, is developed by exposure to

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art. This is attempted in teachings' art (through the practica of teacher education, for example) but as long as theory and practice remain at distance from each other and therefore each stuck in sterile do overs, Dewey's (2003) description of the shock of a teacher candidate who went into schools from teachers' college will continue into the future. She arrived, expecting to find it "run on the basis of these advanced theories of which she had learned. It was the discrepancy between the teaching she had and the actual practice and teaching in the schools that gave her this shock" (MW.15. 184). Even after all these years in schools and despite decades of disappointed effort to effect change, I continue to feel such shocks.

If education takes place in the vital (living) contact between teacher and student, then, as Dewey (2003) argues, "all the rest of the system, organization and administration, is really so much superstructure for enabling the classroom teacher to do his or her work more effectively" (MW.15.182). If teaching is a practice of love, and education a dream of better living for our children that demands ongoing inventiveness, intimacy, slowness, wholeness, with-ness, revision, openness, a desire for what is desirable, a willingness to do difficult things to move toward them, and to find pleasure and sweetness in that effort, then it is necessary to rethink the idea of a superstructure based on efficient and expeditious achievement of prescribed success.

A superstructure – the organization built from and for its foundation of love – must enable growth, not attempt to hurry it, which, however well-meaning, is destructive. In a building, the superstructure creates the *space* for living – doors, windows, roof, walls, stairs, ramps, heating, trims, cupboards – that are built upon the substructure or foundation without which the entire superstructure would collapse. Love (its foundation) is not *dependent* on the space itself (whether physical or online) but on what those spaces make possible.

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Yet unless we not only find ways to gather in spaces (wherever they are) in loving ways to learn with each other, but also to *organize* our learning for continuation of loving education (which is different from replication) growth is stymied and the stalemate of do overs will remain. Even if we move away from arguing for our own position in competition with others to have our policy, program, concept, committee, question, invention, method, or device judged as best (rather than bettering our common work), whatever newness emerges from our conversations is limited in its possibility for growth or even for immediate use beyond the particularities of its application. Unless living methods and spaces are *organized*, even if we are willing to listen and learn together, even if we have opportunities to do so, when we must start from scratch over and over, we are too *tired* to begin again. Moreover, all too often, acts of love that allow flourishing are converted into expectations (if you want to get a job, get promoted, get ahead). The trend of “quiet quitting” that has long existed in schools (to close one’s door and do what is minimally required by contract) is now so prevalent it is named and studied (Gallup, 2023).⁵⁶ Or we allow the strong to prevail, following along, or we let bureaucracy lead, lulled by its promise of ease and efficiency into believing that incommensurables can be weighed and so measured against each other, as though numbers themselves – rather than love – are what is common between us. In this way, without different ways of organizing, whatever is organized continues to be means for improvement or as repositories of best practice – and we do over.

So it is in the face of undesirable difficulties, that even our best intentions are subsumed beneath imposition or in the machinery of a superstructure that organizes by measures outside of the experience itself. What is more, whoever and whatever does not measure up or exists outside of the measures is not included and intolerable injustice continue into the future, such as

⁵⁶ So the teachers, so the students. Quiet quitting in students sounds like, “What do I have to do to get done?” or “Is this for marks?”

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described by Tito Mukhopadhyay (2010), a non-verbal autistic man, for whom school, he writes, is “the doubt in your eyes” (para. 1). His study of the neuro-typical, however, can widen our collective capacity to see from a perspective that has long been missing in schools and for schools. In contemplating the “puzzle” of autism, Mukhopadhyay (2015) asks, “But what is lost by always thinking of wholes. Isn’t the world itself comprised of little pieces? Don’t we always have the choice of focusing on the piece and not the puzzle?” (p. 34). Neurotypicals, he says, “move too fast to notice anything - the shadow of a falling leaf or the smell of wet grass or a ripple on a lake” (p. 34). Living wholeness can only be understood as each of us focus on our little pieces, where we might glimpse a greater wholeness, “a World in a Grain of Sand / And a Heaven in a Wild Flower” (Blake, 1863, lines 1-2). A living whole, unlike a whole puzzle where everything is already fitted and there can be only one solution, can be reconfigured suddenly so that we understand anew: the living *moves*. It is ongoingly (gloriously) puzzling, rather than a puzzle with clear boundaries into which our pieces fit.

Yet conventional science, and education as shaped by it, as Thomas Kuhn (1996) argues, can be understood as solving puzzles *already framed*. As he notes, “Though intrinsic value is no criterion for a puzzle, the assured existence of a solution is” (p. 37). What cannot be reduced to a puzzle form (that is, answerable) is not of interest to conventional science. This will not do for a teachers’ science since its concerns are rarely answerable, or if answered, are answered only provisionally. In this instance. For now. So far. To puzzle over our own small pieces is not a problem; problems proliferate when we use the piece to define and prescribe for the whole, and as a means to validate what is “best.” Tito Mukhopadhyay (2015) reminds us,

There is the typical domain of typical beings who aren’t doubted or tested repeatedly, and who have a real place in education, work, and decision making. And then there is the

“special” domain of “special” beings, where all is shadow, formless and wobbling, and hope itself lies sodden and submerged. (p. 83).

The importance of *living* organization (the superstructure of loving space) is not to make a new *whole* – and therefore different exclusions – but finding ways from *within* the wholeness of living to gather more pieces from which to make anew more expansively, more beautifully, ongoingly.

A few possibilities to begin from: inventories to organize for making with, cabinets of curiosities (anomalies) to attend to rather than ignore, and understanding people, themselves, as a complex, ever-shifting, and most significant infrastructure of loving organization.

Inventories

The great challenge for a teachers' science, therefore, is not only to engage with and make possible living processes (by noticing fruitful patterns and identifying or inventing devices/methods for their propagation) but also to organize them for future use in a way that systematizes “their recollection and enables their circulation” yet does “not seek to provide roadmaps on how something ‘should’ be done” (Sánchez Criado & Estalella, p. 226). Indeed, education as a living and ongoing process, “itself a process of discovering what values are worth while” (Dewey, 1929b, p. 74), cannot merely prepare students and therefore its science cannot supply objectives or ready-made rules. As Dewey (1929a) argues: “Education is a mode of life, of action. As an act it is wider than science” (p. 75). Science does not authorize that action but enables and supports it to “render those who engage in the act more intelligent, more thoughtful, more aware of what they are about, and thus rectify and enrich in the future what they have been doing in the past” (p. 74-76). It provides a record of the significant features of experiences of teachers and students in interaction with other knowledges to provide a stereoscopic view: from

inside – at the vital source of education – and from outside – what Martin Savransky (2023) calls the “experience of opening to a radical exteriority with which all inventive practices communicate” (p. 17). Selection for the inventory, however, is based on significance as evidenced *in practice* by the development of experiences that inspire the desire to go on learning what is desirable.

These records of possibilities (recipes, devices, lessons, materials, strategies, programs) act as planks across the flux of living, not to walk the same path they set or in the same way others have walked it but to inspire or provoke other making, to bring *attention* to possibilities for otherwise.

An inventory is by nature a list of resources *so far*. It expects to be added to, revised or re-sorted. It is not finished nor is it an attempt at completion. It is fully aware of its “piece-ness” while seeking connections that ensure it is not merely piecemeal. Although each item of an inventory does not fill in the contours of a preconceived puzzle, it is an element of significance for developing experience so far from which (it might be possible) to make toward more expansive becoming. The items are not ordered by the container (inventory) but with other items as they are added. Nor is each item “complete” in itself in the sense of being “ready-made” for use. Indeed, it is an inventory of useless things, not the kind of uselessness endemic in education – that is, the offering of what is deemed useful for which we can have no use (the equivalent of warm blankets and heavy coats sent to aid those who live in the tropics) – but rather it is useless in the sense that no use is pre-assigned. They are available resources to be made *with*. As such, “the practice of inventorying is not as an act of preserving the past but stepping into the future” (Sánchez Criado & Estalella, 2023, p. 228). It is *speculative* organization for use in *actual* practice.

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The ordering of the items in the inventory must be ongoingly revised as new knowledges become available and new uses are invented. Provisional organization might collect items that are a part of a (so far) fruitful pattern or as similar devices. The (possible) unity is not in the collection but in what might be made with what is offered. In other words, they are *sources* for the ongoing invention of teachers' art gathered by its science. However, rather than a set of solutions handed down for application (bound in its textbooks and packaged in programs, methods, strategies), it is "a perpetual inventory ... testimony to the irreducibly unstable relations between elements and parts, inclusion and belonging, sensing, knowing and doing" (Lury & Wakeford, 2012, p. 2). The digital affords the unbinding of our organization, the capacities to add rich details through various iterations of a pattern or use of a device and ongoing revisions as new inventing extends possibilities. It makes possible local, intimate, loving experiences to pollinate potential and for foraging from afar, through close contact, to fecundate and bear fruit.

An inventory invites otherwise; it is filled, not with what belongs based on criteria set from outside of the experiences of teaching but with what is selected for inclusion so far. *We can* select otherwise – or move, revise, add, alter. The rules for selection are provisional except that whatever is selected, is selected for its *potential* for development of loving experiences toward better living in actuality. The selections do not represent "best practice" for others to follow or toward which their practices can be improved. An inventory offers no judgment. It doesn't accuse you of not using this or that. It does not put one or another practice on a pinnacle. It does not tell you that this is what you ought to do. An inventory says: Here is an inventory of possibilities that are in our cupboard at the present time. I hope something here helps. If not, let us know. We will see if we can find something else or we will invent something else together.

An inventory contains possibilities, provocations, invitations, inspiration, gifts for those engaged in consequential, complex, intricate, subtle, delicate art of teaching and its practice of love.

Cabinets of Curiosities

One of the great challenges of organization, even one such as inventorying which allows “caring for the singular” (Sánchez Criado & Estalella, 2023, p. 228) is its tendency to become set: the walls, the roof, the boundary edges are gradually cemented in and become an enclosure. A key purpose of the invention of a teachers’ science is not merely to make note of the singular but to organize many knowledges by seeking mutual consistencies so that one might more confidently act in in the future. After all, as Richard Feynman (1998) notes, “Knowledge is of no real value if all you can tell me is what happened yesterday” (p. 25). Yet at the same time, he adds, “To solve any problem that has never been solved before,” – and all living problems are new – “you have to leave the door to the unknown ajar” (p. 27). Without the open door, the gate in the corner pasture of our enclosures left unlatched, we risk becoming so certain that we exclude whatever is not already within our carefully tended patch. Indeed, Feynman adds, “if we did not have a doubt or recognize ignorance, we would not get any new ideas” (p. 27). The space that love makes extends, grows, adds; the boundaries of love make *possible* other boundaries that, in turn, open new spaces for our living work.

Thus, our science must also organize *openings*. Maggie MacLure (2013) suggests cabinets of curiosities, once assembled by aristocrats, merchants and early practitioners of science:

Striving toward taxonomic rigor and completion, in the carefully labeled boxes, drawers, and arrays of natural history specimens, yet always pulled toward the contrary pole of

singularity, wonders and marvels that lie on the boundaries of knowledge: the dragon's horn, the misshapen fetus, the stuffed crocodile hanging from the ceiling. (p. 229)

The things collected are not captured by us but captivate us; they provoke wonder and engage interest, that spark of desire by which we accumulate wisdom. This is a familiar strategy for early educators. Teachers gather together objects in their classrooms as “invitations to enliven curiosity” (British Columbia Ministry of Education, 2019, p. 90). In this way, for old or young, experienced or novice, the objects of wonder, as Tito Mukhopadhyay puts it, “become more than a thing to ignore” (Mukhopadhyay & Savarese, 2010, para. 15), even as a piece, a fragment, or many fragments not yet connected, as are all our stories before they become stories.

Moreover, this kind of collecting allows juxtaposition that slows to provoke what Anna Tsing (2005) calls “odd connections rather than seamless generalizations” (p. xi). This is very different from the intentions of conventional science which seeks to “evade anomalies” (Kuhn, 1996, p. 6). Indeed, a teacher's science is interested in offering and organizing the so far ascertained *and the as yet not quite understood* resources for fruitful invention through attention to the multiplicities from which it draws its patterns, rather than generalizing to authorize, certify or determine what is worthy of attention. *Teaching*, which exists only at the vital source between teacher and student, is its alpha and omega⁵⁷ (James, 1899). As Dewey (1929b) notes,

The sources of educational science are any portions of ascertained knowledge that enter into the heart, head and hands of educators, and which, by entering in, render the performance of the educational function more enlightened, more humane, more truly educational than it was before. (p. 76)

⁵⁷ That teaching is first and last in its own practice does not mean that it is over and above the complex web of relationships that sustain and support that practice.

Educational significance, what is “truly educational,” Dewey adds, is discovered in the “continuation of the educational act itself. The discovery is never made; it is always making” (p. 77).

People as Infrastructure

If love is the foundation upon which the superstructure of education is built, then people are its most significant infrastructure. “People as infrastructure” is a phrase coined by urbanist AbdouMaliq Simone (2004) to complicate and extend the way that the physical infrastructure of a city (highways, pipes, wires, cables) is determined by the efficient deployment of people. People, he argues, operate on the city in ways that are “radically open, flexible, and provisional” (p. 407) and their ability to “engage complex combinations of objects, spaces, persons, and practices” (p.408) becomes an infrastructure of the city. This is an invisible infrastructure that is only made in the making and remade ongoingly in concrete acts and contexts of collaborations of mutual dependence enabled by being together in a shared space “as a fabric of entangled attunements, maneuvers, and antagonisms among shape-shifting constellations of materials and bodies” (Simone, 2021, p. 1341). This is different from assigned roles (leader, for example) or policies (inclusion) which understand people as an aggregate of units, each with a set of “disembodied skills” (Costello et al., p. 462), interchangeable and passive to be slotted into a prefabricated whole rather than as part of a *living*, and therefore, dynamic whole.

Recently, in a growing city in British Columbia, the school district sent home a survey to parents with some ideas for optimizing limited space, including bussing to different communities, working in shifts, and hybrid learning, with assurances from the superintendent/CEO that in any of the suggested options, “we can effectively prepare students for future careers in align with the workplace landscape” (CBC Radio, 2023, 8:50).

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This viewpoint exposes two issues that thwart a superstructure for love. First, the idea of education as preparation, which is a tenacious one, continues to challenge the possibility of other futures. Whitehead (1929a) calls preparation “one of the most fatal, erroneous, and dangerous conceptions ever introduced into the theory of education. The mind is never passive; it is in a perpetual activity, delicate, receptive, responsive to stimuli. You cannot postpone life until you have sharpened it” (p. 6). If we ask, instead, not what spaces effectively *prepare* students, but what is the space *love* makes, a different picture emerges entirely. What has become familiar in schools will not do.

Indeed, and this is the second and connected issue, when we understand *people* as infrastructure, a question of overcrowding spaces in schools, for example, solved by bussing, shifts of time (scheduling) and space (to the virtual) without consideration of the impact on the infrastructure of people is the equivalent of smashing the physical school structures with a wrecking ball and then gathering up the pieces to erect it again in the lot across the street. Yet in schools, people are moved in and out of classrooms or back and forth between virtual and physical spaces with much less care and consideration than is taken to add a wall or paint it. Indeed, Whitehead (1929a) argues that external imposition on schools without consideration of the people within is productive of nothing but “educational waste” (p. 13). Yet, we are profligate in our waste of people. Given the significance of people for education, they must always be of first consideration.

Sir Ken Robinson (2011) suggests this thought experiment: Take away everything from our schools, classrooms, the desks, pencils, books, bulletin boards, computers, of course, walls and roof even, what is the irreducible minimum that must remain for teaching and learning to occur? He argues you can take everything away except the relationship between *people* – the

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teacher and the student – and says that we should add nothing, echoing Dewey and James, unless it *helps* this relationship in some way. Yet, Whitehead (1929a) notes, we impose curriculum on people as though *it* is more significant. Curriculum, he says, must be developed *with* the people involved, evolved from their individual specialisms and the constellations of their intersecting knowledges, so that together (as a living whole), they impart “an intimate sense for the power of ideas, the beauty of ideas” (p. 12) and “the art of the utilization of knowledge” (p. 4). To impose curriculum, as though the people are simply a passive conduit for it, privileges inert knowledge while living knowledge lies fallow.

Perhaps this is the most significant work of reimagining for a teachers’ science – to seek processes for the repair, renovation, restoration, and reworking of relationships (entanglements) that make a robust infrastructuring of people without which education will not run and within which the impossible work of teaching can flourish.

Love’s Living Measure

One final aspect for developing a model for a new science is necessary: its measurement of value. How will the desirable be *judged*? Who will decide? This is a key component of a mature scientific community, Kuhn notes:

One of the strongest, if still unwritten, rules of scientific life is the prohibition of appeals to heads of state or to the populace at large in matters scientific. Recognition of the existence of a uniquely competent professional group and acceptance of its role as the exclusive arbiter of professional achievement has further implications. The group’s members, as individuals and by virtue of their shared training and experience, must be seen as the sole possessors of the rules of the game or of some equivalent basis for unequivocal judgments. (p.168)

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Yet it is exactly this unwritten rule that this model upsets. First, whatever is found out by a teacher's science is tested not against its own criteria and *peer* scrutiny, the group's members, but in a wider community of concern toward mutual agreement and more, it is verified by teachers, themselves, in practice. Rather than reducing the community within which its findings are valued, it widens in connections around the center of concern: the children. At present, children are raised in homes that are separate from classrooms where they spend a large part of their day, which are to a large degree separate within schools which in turn are separate from laboratories and government offices that make decisions about what goes on within them.

However, if the focal point of value turns toward the children, to our love of them and our dreams for them, it seems more and more unimaginable that we allow calculations against measures external to their experiences determine what is valuable for them and what makes *them* valuable – that is, how they can become successful. Instead, surely, as Janusz Korczak argues, “children should be exposed to the beauty and the sublime which they carry within their heart” (quoted in Efron, 2008, p. 52). For our children to learn, through schooling, that their worth is defined *outside of their own power* is to hollow them out, to leave them empty of wonder, of curiosity, of any desire to move *themselves* in the direction of what is desirable. Instead, because, “acceptance is predicated on superiority” (Benjamin, 2024, p. 67), they must do as they are told to be made better according to external standards. Otherwise, they remain inferior. Any gifts outside the standards are irrelevant to their success. “The act of measurement,” Petar Jandrić (2021) says, “kills potentiality by selecting only one of many possible options” (p. 21).⁵⁸ If we understand education as *nourishing* the potential of our children, then it will not do.

⁵⁸ Often in education, we confuse feedback and measurement. Feedback, certainly, is essential to living, but feedback is context-dependent, self-determined, focused on adaptability and growth, and a process of co-adaptation with the environment. Measurement is imposed, external and predetermined; its focus is on

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Measurement, however, does work well for efficiency toward a preselected end. For example, if we want chickens to produce more eggs (keep in a small cage), or beef to be more tender (chain calves to prevent their movement and slaughter them young) or tomatoes all year long (grow under lights in greenhouses). Prior selection of value creates the boundaries that enable research to produce solutions that can be measured. In the case of education research, how to motivate children to read, write, compute; how to improve their attention, productivity, accuracy, or test scores; how to help them manage their emotions, thoughts, behaviours. Without first defining success, we have nothing to measure and no way to know “what works.” With measurement, however, education becomes a factory for producing “better” children rather than a space for developing their potential toward better living in better futures.

Yet how, then, do we reimagine ways for determining what is “better”? How can we say to parents who love their children that yes, their living is better for having become educated? Here is the stumbling ground of any attempt to disengage education from calculation. We have come to trust numbers more than we trust each other.

But we already know other measures. As Whitehead (1938) points out, “the feeling, widespread among mathematicians, that some proofs are more beautiful than others, should excite the attention of philosophers” (p. 84). Researcher Elaine Scarry, in a conversation with Michael Hauskeller (2022) suggests a reason:

This may be because the beautiful person or tree or mathematical theorem or sunrise brings about a higher level of attention that raises the bar for what counts as perceptual acuity, helping to establish in the perceiver a higher capacity for attention that can then in turn be given to other perceptual objects that previously seemed unremarkable. (p. 249).

stability and control and therefore adaptation is to the measurement itself (Wheatley & Kellner-Rogers, 1999). Feedback cannot exist outside of the experience itself.

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Beauty, she argues, not only provokes a greater acuity of perception, but also “provokes in us the care to extend the life of the beautiful thing” (p. 254).⁵⁹ In other words, beauty is an *educational* measure: beauty allows us to grow and to grow in a direction of what is desirable – that is, toward a wider range and denser web of loving care. The opposite of beauty, Scarry argues, is injury:

The alternative for a future humanity between catastrophe (whether brought about by nuclear peril, climate change or runaway artificial intelligence) or instead a transformed realm of greater aliveness and more just relations is surely a stark choice between injury on the one hand and beauty on the other. (in Hauskeller, 2022, p. 255)

We choose beauty for our children. Education that injures them is not only an injury to the child but extends into the future and out to the living world that injured humans injure. “Part of the work of beauty,” Scarry contends, “is to make us unequivocally opposed to injury – to make us not just rationally but irrationally and intuitively opposed” (in Hauskeller, 2022, p. 255).⁶⁰ An education that loves our children must be beautiful.

Injury, perhaps, is easier to define than beauty. It can be understood as a difficulty inflicted. Difficulties are the inevitable obstacles, even hardships, along the way of living; they are “desirable” in so far as they are within our agency to overcome. An injury is damage or harm that is *outside* of the agency of the one harmed. To *inflict* injury is not only unjust but intolerable. Beauty cannot be defined as “injury free”; what is injured can be beautiful. Instead, injury, Scarry argues, is a *constraint* on what constitutes the beautiful. What *injures* is not beautiful. It is

⁵⁹ As a child, I remember watching a beauty pageant on TV. The reason is lost in the mists of time, but I do remember wondering why my mother was not in the contest. I perceived beauty then with an acuity that was long lost to me as I accepted limited measures of it. Love, I realize now, is a lens for seeing the beautiful.

⁶⁰ “Reason without unreason,” John Caputo (2000) says, “is a smooth surface, a superficial transparency; reason with unreason speaks from the depth” (p. 21).

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also a constraint on what constitutes love. “There can be no love,” bell hooks (2001) argues, “without justice” (p.19). To inflict injury is always unjust.

What is beautiful, too, is intimate – we are *moved* by what is beautiful – and perhaps this is why injury is opposed by beauty. Simone Weil (1977) distinguishes between sacredness (that which is of inarguable and immeasurable value) and rights (what can be measured and, therefore, disputed) that she says are inadequate for just living:

What is it, exactly, that prevents me from putting that man's eyes out if I am allowed to do so and if it takes my fancy?

Although it is the whole of him that is sacred to me, he is not sacred in all respects and from every point of view. He is not sacred in as much as he happens to have long arms, blue eyes, or possibly commonplace thoughts. Nor as a duke, if he is one; nor as a dustman, if that is what he is. Nothing of all this would stay my hand.

What would stay it is the knowledge that if someone were to put out his eyes, his soul would be lacerated by the thought that harm was being done to him.

At the bottom of the heart of every human being...there is something that goes on indominantly expecting...that good and not evil will be done to [them]. (pp. 314-15)

It is only when we move *out* of intimacy, when the other is a representation only, a package, a part, that injury becomes possible.

The intimacy of beauty means that it cannot be imposed. I cannot tell you what is beautiful.

I began this long journey as a quest for understanding beautiful teaching, acknowledging that it could not be defined or measured (both are impositions) but that it can be felt. It is *experienced*.

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Once I was in a church in Russia, beautiful in itself, its soaring ceiling painted with icons, but when a group of monks stepped into the space and sang, I felt beauty to the point of pain, tears wrenched from me, and from the people who stood beside me and the large man behind me whose body clenched and released into great sobs as if the music had touched a deep wound. That without imposition we feel in common is the miracle of beauty. “Beauty,” poet Adrienne Rich (2001) says, “reminds us of kinship where all is represented as separation” (p. 111). Yet as John Caputo (1998) remarks “the possibility of this deep experience is constantly presenting itself to us in even the most simple and commonplace experiences of everyday life” (p. 272). Education, through “experiences that live fruitfully and creatively in subsequent experiences” (Dewey, 1938, p. 27-28) extends our capacity to *feel* the beautiful and, at the same time, to oppose, more irrevocably, even unreasonably, that which injures. “The experience of beauty,” poet John O’Donohue (2003) argues, “always resembles a beginning. A clearance opens in the heart for something new” (p. 20). That newness, he suggests, is “about more rounded, substantial becoming...an emerging fullness, a greater sense of grace and elegance, a deeper sense of depth, and also a kind of homecoming for the enriched memory of your unfolding life” (O’Donohue & Tippit, 2008, para. 1). Beauty is not meeting expectations, measuring up, an end, an achievement. It propels our development; it does not compel it.

We cannot protect our children from injury in the wider world of experience or, indeed, in the near places with those whom they love. We can, however, move toward growing their potential to make futures that are more just. That potential is enabled by expansion not closure, by beautiful experiences, not carefully calibrated improvements in the skills, knowledge and attitudes deemed necessary for future careers that continue the way things are.

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But how will our science use beauty as a metric for selecting patterns and devices for inventories or for the organization of infrastructures?

It cannot.

Once science shifts from above and outside education, it can select resources that have been measured by measures internal to a given area of study but understands that whatever it offers is only something to *make with*. For example, in contemplating the use of intelligence tests in education, Dewey (2003) argues that the danger is not in testing itself but in the belief that in measuring “you have a certain insight and measurement of [the child] as an individual” (MW.15.183). Indeed, he argues, because it is an understanding derived from averaging, “you do not know any more about the individual than you did before” (MW.15.183). However, it is a source for information that might help a teacher to find a desirable difficulty for the individual, guarding “against the mistake of trying to make an individual go at a faster pace than [they are] capable of moving” (MW.15.183). Yet. So far. After all, he points out, this can only be the *beginning* of a teacher’s work.

A teachers’ science does not prescribe the values of education, nor can it define its measures. It is *within* education.

Indeed, it must seek, from teaching itself, sources for its own growth. More often, research is seen as above and outside the practice of teaching and, as Dewey (2003) notes,

The further away one is from children and from the only place where education takes place, the direct contact of mind and mind, the greater is the probability that one will be an educational authority and looked up to with respect and envy. (LW.2.123)

He argues that “we can measure the dawn of a serious faith in education by the manifestation of willingness to pay the highest wages going to those who actively direct the education of the

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youngest” (LW.2.121). Such a dawn has not yet arrived. What is necessary, first, is a living connection between our science and our art such that it is possible for them to “reciprocally confirm and illuminate one another” (Dewey, 1929b, p. 22). To do so, a teachers’ science must be illuminated by our art as often as it stands as a “light to the eyes and a lamp to the feet” (Dewey, 1929b, p. 15) of our art. In particular, it should seek illumination from teachers of our youngest children.

Teachers in the ongoing presence of young children are more deeply aware of their potentiality and promise. Although there are children who have already been injured, they have not yet been injured by school and the “indomitable expectation that good and not evil will be done to them” (Weil, 1977, p. 315) shines in their eyes; their light inspires teachers. In the *British Columbia Early Learning Framework* (2019), for example, early educators have devised the use of pedagogical narration to

challenge educators to let go of predetermined outcomes and to remain curious, open, inventive, and respectful of children’s thinking. The intention is not to provide answers or a predictable goal for children’s learning but to connect with the living inquiries and keep the learning process “alive.” (p. 51)

Nor is its intention to judge children or their production but to “listen deeply, be curious, embrace wonder, share the story” (p. 51). The story of the child is not told “about” them, a closure, but from and with, an opening, a beginning for conversation that might make a difference in planning for the next (beautiful) experiences of the child. A story turns listeners into witnesses not judges and the protagonist (the child) becomes seen, becomes significant, not a number (a percentile calculated against widely held expectations) or defined by deficits or even strengths (as though either can be so neatly compartmentalized) but as a glimpse into the

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emerging fullness of their being now and yet to come. The *better* of better living is not imposed but grows; it is not a judgement but a longing.

What is recorded from the doings of children, data which is now so easy to capture *as* they are doing through digital devices, in the same way as the “capture” of intelligence quotient through testing, represents only a beginning for teachers, a helpful starting place, rather than starting from scratch. Yet like testing, the idea that whatever can be “datified” – made into data form – and therefore analyzed to provide “each learner with resources relevant to his or her profile, learning goals, and the knowledge domain the learner is attempting to master” (Siemens & Long, 2011, p. 38) is dangerous, reducing the living whole and its movement toward better futures to a set of goals (knowledge, skills, and attitudes) to achieve. Data, however (including but not limited to what can be digitized) can be gathered not merely to count and analyze, but to make (otherwise) with, not merely to report and graph, but as an opening into conversations that add multiple perspectives to deepen, extend, broaden. In other words, science, to become educational, must see itself as within teachings' wider horizon; it does not ask teaching to become less than whole to fit under its control.

Sometimes it feels safer to ensure, through numbers, that children are each getting the same experience, but of course we know that the same experience will not do for different children who are not automatons, nor are they taught by automatons, nor do they live in a clockwork world. Mechanical measures will not do. But with each other, in our very multiplicities, acting with more conscious collaboration to widen the opportunities for beautiful experiences for our children, the risk – the gap, the crack, the open gate – becomes the possibility from which we leap into better futures.

Consequences Revisited

To think, Dewey (1916) argues, “is the intentional endeavor to discover specific connections between something which we do and the consequences which result, so that the two become continuous” (p. 170). A new science, Kuhn says, not only begins from a different premise, but makes possible “a decisive difference in the modes of solution” (p. 85) – in other words, different ways of doing – that, therefore, yields qualitatively different consequences (Dewey, 1929b). This speculation is an intentional endeavor to imagine different consequences and invent a different model for doing differently that can make those consequences possible. A lingering question, however, is whether a new science is necessary. Currently, using *existing* modes of solution, science is making extraordinary advances that, arguably, will solve the problem of stagnation in education if we heed its findings – or, if humans cannot, will very soon create solutions through artificial means. As Alfred Bork (2001), pioneer in the field of educational technology, argues, we can now eliminate “the flaws inherent in teaching” (p. 144); by applying knowledge from research, he says, “we will be putting everyone on the educational moon. It is a glorious prospect, within our grasp” (p. 144). Now, only a quarter century later, what seems hyperbole sounds like mere fact. And yet, what is the promise of such a prospect?

E.F. Schumacher (1977) argues that the idea that ‘science will find a way out’ (out of environmental devastation, for example, and the ongoing injustices and inequity in education) “could be right only...if there is a conscious and fundamental change in the *direction* of scientific effort” (p. 27). It must shift from expansionist success which he argues is “propelled by a frenzy of greed and indulges an orgy of envy” (p. 28) to an expansiveness that allows us to see things in “their roundness and wholeness” (p. 29). Science, he says, must become wise: “Wisdom demands a new orientation of science and technology toward the organic, the gentle,

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the non-violent, the elegant and beautiful” (p. 31). Education, which he argues is our greatest resource, “can help us only if it produces more wisdom” (p. 75).

There is no easy path to wisdom, however. As Whitehead (1929a) notes:

You cannot be wise without some basis of knowledge, but you can easily acquire knowledge and remain bare of wisdom. Now wisdom is the way knowledge is held. It concerns the handling of knowledge, its selection for the determination of relevant issues, its employment *to add value to our immediate experience*. This mastery of knowledge, which is wisdom, is the most intimate freedom available. (p. 30)

The modes of solution of contemporary science to gain more and more knowledge through the “ascertainment of fact and correction of false belief” (James, 1912, p. 66), if wisdom is a desired consequence, is limited and limiting. Turning over the authority for education to science is, Dewey (1929b) argues, “an abdication” (p. 77) and arrests the growth of education and thereby the growth of science which is *within* education. However, the abdication is unsurprising. The difficulties in education (of living itself) have become increasingly complex and intractable. Thus, as Margaret Wheatley (2005) argues,

People are more polarized, more overwhelmed, more impatient, more easily disappointed in others, and more withdrawn than ever. We’re frustrated by the increasing number of problems that confront us and our impotence to resolve even the most simple ones. (p. viii).

At the same time, as we lose faith in our individual powers and each other, science has become more successful, *extravagantly* successful (Theise, 2023), in its endeavors and has gained confidence.

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The new wisdom necessary, Michel Serres (1995) argues, in a world of advanced science and technology is to this question: “How can we dominate our domination; how can we master our own mastery?” (p. 172). What is difficult, he says, is that our increased knowledge makes us responsible not only for our own lives (when we know that overeating causes ill health, we can no longer blame fate) but of others (by burning fossil fuels, for example, we cause millions of people to die prematurely) and for the future in concrete ways (MacAskill, 2022). The difficulties that seem so far out of our individual control, produce overwhelming despair.⁶¹ Yet the cure for despair, Margaret Wheatley (2002) says, is not an aimless hope: “It’s discovering what we want to do about something we care about” (p. 19). In other words, we must grow up and into handling our knowledge *wisely* (the art of the utilization of knowledge) so that we select from that knowledge in the way of grownups – desiring (valuing) what is desirable. The new direction for science, Serres argues, is neither the way of the hard sciences that attempt to go without humans, “thereby risking becoming inhumane” (p. 180), nor as the social sciences, that go without world or objects, “thereby exposing themselves to irresponsibility” (p. 180), since both, he says, forget the humanities: “that continuous cry of suffering, that multiple and universal expressing, in every language, of human misfortune” (p. 180). Like love and pain, knowledge and misfortune, he argues, “cannot be separated” (p. 181). Even if it were possible to know absolutely, he says, “we would know nothing without, at most, the experience of – or, at least, hearkening to – this suffering that is without remission and without end” (p. 181). The direction of wisdom is in the direction of love, which is beautiful and away from injury which, in its most egregious form, is suffering.

⁶¹ Charles Taylor (1991) describes this despair as the malaise of modernity. As each of us become more responsible individually, the idea of a collective, even magic, world disappears (a loss of meaning): we have nothing to die for, he says (or, indeed, to become grownup for). All that is left for measuring worth is the calculative (the eclipse of ends) against which we have no power (loss of freedom).

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Wisdom, Serres (1995) argues, “requires us to invent a third curriculum which will weave the warp of the rediscovered humanities to the woof of expert exactitude” (p. 184) – and at the intersection is beauty. There is, he says, no abstract wisdom, only *living* wisdom, which is the work of education. “What *difference* does it make if I am [wise],” he asks, “if my successors do not become wise?” (p. 184). Wisdom lives only in our children who create the futures we dream for them. The difference we make is in the difference we make *possible*.

This difference, however, is not the difference that separates us from each other, the difference between those who know better and those who do not, for example, or between our past knowledge and the better knowing achieved in the present through progress. This is a “temporalizing of difference” (Savransky, 2012, p. 1) that, as Serres (1995) points out, demands that we “conceive of time as an irreversible line, whether interrupted or continuous, of acquisitions and inventions. We go from generalizations to discoveries, leaving behind us a trail of errors finally corrected – like a cloud of ink from a squid. ‘Whew! We've finally arrived at the truth’ (p. 48). As Martin Savransky (2012) notes, “‘Been there; Done that. We used to believe; Now we know.’ This has been the basic leitmotif of modern knowledge to assert itself against and above other knowledge-practices” (p. 2). Indeed, one of the questions I have frequently fielded in my research is “How is this different from what has already been done?” But this is not the difference we concern ourselves with when we imagine otherwise for children.

The work of education is complex, subtle, delicate. Whitehead (1929a) writes, Education is the guidance of the individual toward a comprehension of the art of life; and by the art of life I mean the most complete achievement of varied activity expressing the potentialities of that living creature in the face of its actual environment. (p. 39)

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Until our science grows up into “the organic, the gentle, the non-violent, the elegant and beautiful” (Schumacher, 1977, p. 31) – in other words into love with love – then our art, which is presently authorized by it, cannot grow up either – nor our teachers, nor our children. Nor our living now. Nor our future.

But it could be different.

This invention of a model for another science, a teachers' science is developed from a different premise – love – and its ways of finding things out, as well as how it organizes and evaluates of what it found out turns away from being an authority over practice to become a helpmate, gathering, organizing, listening, opening, adding, inviting and selecting from diverse knowledges what is affirmed from within those knowledges and then *organizing* them for the better going on of what is educational, that which enters into “the heart, head and hands of educators” (Dewey, 1929b, p. 76) and toward what makes better living possible for our children and our children's children.

We already know about such loving help and organization – about what Ursula Le Guin (1986) calls “the art of making order where people live” (para. 25): housekeeping. This is nothing so limited as the sanitizing, sterilizing, methodical *business* of cleaners, but, she says, a “great, ancient, complex, and necessary art” (para. 25), and its devaluing is “evidence of the barbarity, the aesthetic and ethical bankruptcy, of our society” (para. 25). In the same way that study has been reduced to something done in a certain way in a certain place by certain people, so too the “right” to order things has been claimed by authorities and a rich legacy of living order has been “stigmatized as unfit for ‘higher’ pursuits” (Le Guin, 1986, para. 25). Science, along with those who wield its powers, has become too big for its britches, in my mother's phrase, “is playing God” (para. 5) as Le Guin puts it. Such overreaching has been warned against since time

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immemorial as the path to tragedy. In this invention of another science, of science otherwise, it is not a science that seeks order for the sake of ordering, but to make order with people where they live. It does not seek better knowing to merely extend knowledge nor for its own aggrandizement. It seeks knowing, rather, to become wise. Wisdom is not knowing that you know it all, but knowing that you do not, yet still moving, still contributing toward what might make better living, and because we live within the world with others, trusting those who are moving with us. It does not seek “what works”; it understands that living is always a working out. There are no guarantees. Indeed, the best guarantee in a world that is without guarantee, William James (1911) suggests, is “a certain wholeness in our faith”:

To calculate the probabilities and act fractionally...would be to make the worst possible mess of it. Inaction also often counts as action. In many issues the inertia of one member will impede the success of the whole as much as [their] opposition will. To refuse, e.g., to testify against villainy, is practically to help it to prevail” (p. 228).

For those of us who have seen the future, the atrocities of Nazi Germany, aided by the many who turned away or went along, who did not testify against evil, is one tragedy amongst many that illustrate the unspeakable consequences of sanctioned, even authorized, inaction.

The invention of a teachers' science is an attempt toward wholeness with faith in each other. We do not need to work in the same way or in “best” ways as defined by calculation and indeed, the stagnation in education might be understood as the inertia so produced. Together, in “a pluralism of independent powers” (James, 1911, p. 229), success depends not merely on finding what works, but that each of us work, such that, James (1911) argues:

It will succeed just in proportion as more of these work for its success. If none work, it will fail. If each does [their] best, it will not fail. Its destiny thus hangs on an *if*, or on a

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lot of *ifs* – which amounts to saying ... that, the world being as yet unfinished, its total character can be expressed only by hypothetical and not by categorical propositions. (p. 229)

This speculation, the (hypothetical) invention of a model of science for the art of teaching imagines a science (in a roomy, loose sense of science), an intimate science, whose interest is not in “new ways of accomplishing more efficiently ends already current, but means that will yield consequences, ends, that are qualitatively different” (Dewey, 1929b, p. 60). However, it hangs on a lot of ifs – if we love our children, and send them to school as a testimony to our love, as an enactment of it; if we dream of better living for them and have faith that we can act together to make dreams become true; if we have faith in the potential of our plurality to extend the horizons of possibilities; and if we can develop processes so each of us, fully alive, fully participating, *can* work for its success, then, even if we steer wrongly, the promise is in the hand, heads and heart from teachers to our children who will right the course.

Chapter 5: Revelations for Revolutions

Yes

It could happen any time, tornado,
earthquake, Armageddon. It could happen.
Or sunshine, love, salvation.

It could, you know. That's why we wake
and look out — no guarantees
in this life.

But some bonuses, like morning,
like right now, like noon,
like evening.

~ William Stafford

Chapter 5 Gloss

In this chapter, the narrator realizes that far from reaching the conclusion of her research, she must begin again: her model is insufficient for the revolution she dreams of. For the model to become actual (and thereby start a revolution), others must convert to its idea. Yet to do so, they must take up the model as a matter of faith, since the model, as speculative, cannot be proven. One way for others to become convinced of its worth (and therefore convert) is through thought experiments that reveal the new way of seeing the world that the model provides. The new seeing is a revelation and leads to the belief not only that the new model is better but that to continue to use the old one is impossible for them. Before sharing the thought experiments, the narrator considers some of the difficulties both to develop them and to receive the revelation they contain. After all, it is common to block a revelation since it demands a shift in one's entire constellation of beliefs and profound, irrevocable change. The thought experiments, therefore, are told as miracles, the path to instantaneous conversion. Then, imagining converted readers, the narrator gathers those at the kitchen table, as if they were living in a new world (which is this one seen anew). She outlines four possibilities of what is now moving for creating a teachers' science in the actual world. Finally, she reflects on how education technology can fecundate the loving possibilities of this model.

Beginning Yet Again

For Mrs. Swaffield, my long-ago teacher in that now deserted logging camp on the coast of British Columbia, even though she had nine students from six to 16, no additional support, and few resources, teaching would likely have been easier, or at least less complicated than for most teachers today. Her tasks were clear. We began the morning with the Lord's Prayer and the singing of both O Canada and God Save the Queen. We then got out workbooks, progressing through them at our own pace, an early version of today's technology assisted personalized learning. We obeyed the teacher – or else. Although television was causing ripples of change in the world, we did not yet feel it in our remote corner of it. As the land was bulldozed for roads and any good finds exposed from the razed middens sold to museums (McMillan, 2013), as the trees were clearcut, streams unprotected and salmon dying in the sudden sun, as children just like me, living in nearby communities, were scooped up from their homes and deposited in “better” ones, when few asked why we were learning the history of a remote country or reading its literature, or protested that they were not Christian and did not want their children inculcated in its tenets, or questioned the exclusion of Kenny from our little school – although much later I did ask my mother and she said he was “not right” – it was surely possible for Mrs. Swaffield to move with more confidence through her day than teachers today. My students now, learning to become teachers, feel like they are crossing a minefield as they navigate their teaching practicums. They question every move they make and expect their professors to convert those questions into answers so they, too, can move with confidence despite the vastly changed landscape of their work.

Certainly, we know better than when I was a girl, and our curriculum reflects it. Teachers in British Columbia are still expected to give students materials to read, problems to solve and

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corrections from which to improve, but in addition, they are required to get their students to understand that language and literature will help them find meaning and joy, to respond to multiple types of texts (including texts written of and from local communities and in the languages of the community) and to create texts (using the ever-growing media forms now available); to think critically *and* creatively; to use language with increasing artistry and precision (not merely correctness); to use multiple strategies to develop, construct, and apply mathematical understanding through problem solving (not simply use algorithms to compute correctly); to inductively and deductively reason and use logic to explore, make connections, predict, analyse, generalize, and draw conclusions (not only to memorize information and repeat it correctly); to assess and compare the significance of people, places, events, and developments over time and place and from different perspectives; to ask questions and corroborate inferences about the content and origins of multiple sources (not simply accept a given version from the official or majority perspective). That is just a fraction of the list for Socials Studies, Math, and English. Add Science, Physical and Health Education, French, Arts Education, Career Education, Applied Design, Skills, and Technologies (B.C. Ministry of Education, 2016). Add an expectation, entirely absent from Mrs. Swaffield's teaching manuals, to teach a rapidly evolving and urgently needed digital literacy to understand not only how to use technology but the risks and ethical implications of using it. And we know better, now, about inclusion. No child can be excluded (for example, for race, ethnicity, religion, gender, ability) and there is an expectation – one that was certainly absent when I was a child – that every child *can* learn and if they do not, the teacher must come to know better.

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What remains the same, however, is that the teacher is, by and large, alone all day with many children in one room.⁶²

I recently spent time in a remote community in Nuu-chah-nulth territory – a place near the ones where I grew up. Logging is almost entirely gone now and fishing dying, too, with the dying fish in depleted environments. Few people remain besides those for whom it is the ancestral home they returned to after residential schools and foster care.

The teachers in this remote community, like Mrs. Swaffield, must teach many children in multi-age classrooms as they are called now, and not *some* of the children in the community, the ones deemed “right” or “ready” for school, but all of them. The children – many carrying a world of distractions in their pockets or sleepy yet from a long night of video games, or from the interruptions and eruptions of living in a community so long severed from its histories, its language, and its ways of knowing and being hollowed out by absences that cannot be filled – are expected to be included in rich, positive, developmentally appropriate experiences. It is hardly surprising that these teachers want someone to tell them how this can be done. Yet the barrage of answers now available to them, an extraordinary abundance next to Mrs. Swaffield’s teaching manuals – experts flown in or Zoomed in, courses, books, and conferences online, always-available instant information from social media, podcasts and via search engines – do not work.

They feel abandoned there.

Teachers come one year and leave the next.

Students attend sporadically.

Wrongs proliferate.

⁶² Even as the word “room,” too, changes to include forests (in BC, there are a growing number of outdoor classrooms) and virtual spaces, the constant is one teacher to many students.

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Teaching has become impossible, not impossible in the way that love is, in the way our yearnings for something better always are, but impossible in the way Icarus' feather and wax wings were to sustain flight. Yet no one seems to be attending, much like in Breughel's painting of Icarus as seen through W.H. Auden's (1940) eyes,

how everything turns away

Quite leisurely from the disaster; the ploughman may

Have heard the splash, the forsaken cry,

But for him it was not an important failure; the sun shone

As it had to on the white legs disappearing into the green

Water; and the expensive delicate ship that must have seen

Something amazing, a boy falling out of the sky,

had somewhere to get to and sailed calmly on. (lines 14 - 21)

Or, if noticed, if anyone pauses in their busyness, they see a technical failure that can be solved through aerodynamic theory and lightweight, heat-resistant materials. The purpose of that flight is lost and so what is important in its failure: Icarus' attempt to escape from imprisonment in the maze of his father's making, a dream of freedom not flying.

And here, after a quarter century of attempting to escape education as imposition (a pernicious form of imprisonment since it is sold as "good for you"), of failing over and over, and now, with this apotheosis of my efforts, when I think I have at last invented something that might fly, I realize it is not enough. Indeed, to accept *acceptance* of a revolutionary idea – and a teachers' science is revolutionary, or it is nothing – is to collude in suppressing it. After all, it is one thing to have others say, "This is a well-reasoned idea," or "Although I don't quite agree with you, I can accept that you have organized your thoughts well and convincingly," and quite

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another for them to *believe* in the idea such that they are willing to *act* upon it and, indeed, to feel that to act otherwise is intolerable. Yet if they do not – if *you* do not – it will not fly, and I end where I began – making no difference.

There can be little doubt that we already have a surfeit of good or acceptable or interesting ideas to *add* to what we already know. Indeed, in education we have a long history of promising ideas, taken up for a short time and then left on the back shelf to clutter classroom cupboards as new ones gain ascendancy. Today, those good ideas are widely accessible, shared not only in academic journals, education conferences and at universities, but on teacher blogs, podcasts, Instagram feeds, TikTok. We do not need to add *more* ideas. Indeed, as David Jardine (1998) writes, “Our burgeoning edifices of knowledge...are threatening to collapse under their own weight, threatening to do nothing more than exhaust us in their nightmarish hurry to finally get things right” (p. 12).

What is needed is not an addition to what is, but a revolutionary idea that opens into a new beginning. Yet an *idea* is always inert: for a revolution to happen from it, in other words, for it to be *acted* upon, conversion *to* the idea is necessary.

Thus, just when I thought I could coast into a conclusion at last, I must return to home again, where actual teaching and learning takes place, its entanglements and ambiguities, its weight and even oppressiveness. I must leave the unsullied cloudlessness and delight of exploration in the not-yet, the imagined otherwise, an invention of a model for a teachers’ science, shiny, new, possible, to begin again here, first, to show, if I can, what it *means* to convert. And then, against steep odds, I must attempt conversion. And, indeed, conversion *is* the conclusion.

Conversion as Conclusion

Unlike more familiar terms in research for the conclusion of research, discussion, for example, or interpretation of findings, the word conversion conjures acquiescing in exactly the kind of unsubstantiated beliefs that science stands against. Yet for speculative research, there are no “findings” to interpret. One *imagines* otherwise. I have imagined, here, a different model for science in education. To make that science actual, however, and I draw upon Thomas Kuhn’s (1996) investigation of the history of change (revolutions) in science, conversion *is* necessary. A science is made in, with and as a community willing to act together upon shared values; a revolution is a “reconstruction of group commitments” (Kuhn, 1996, p. 181). The pattern he identifies for the conversion of a community to a different commitment, and one I will follow here, is first, the failures – problems that cannot be solved – must be seen as significant, as impossible to fix with the existing ways of seeing and doing things. Second, another model developed from a different premise must be created that can make sense of what did not make sense before. However, he says, in the beginning, *for* beginning otherwise, because a new model is speculative and cannot yet be proven, it must be *felt* as a revelation, so others come to have *faith* in the new idea. This, too, feels contrary to what we think of as the norms or established ways of thinking as scientists. Finally, thought experiments, although presenting nothing new, can provoke a revelation by revealing how the old model cannot solve what matters and show glimpses of ways that a new model offers possibilities to do so.

In conclusion – and for conversion – I will review the important failures of my story of education, revisit the new model that I have created, identify what is necessary in order to *feel* a revelation, and then present four thought experiments, what I have called miracles, to provoke conversion that leads to revolution.

Indeed, all revolutions, even educative revolutions that are “a wick of desire” (Rich, 1993, p. 241) *begin* in conversion. For a revolution of desire, conversion is what Leonard Cohen calls a “revelation in the heart rather than a confrontation or a call-to-arms or a defense” (in Zollo, 2021, para. 47). For such conversions, nothing changes and everything changes: “confronting the same constellation of objects as before and knowing that [the person] does so, [they] nevertheless find them transformed through and through in many of their details” (Kuhn, 1996, p. 121).

Important Failures

I keep circling back to stories of failures. These are not failures of education itself, which, as a work of art is an experience, one that is made and remade, a process of living, but of the *idea* of how to go on as educators. The stories are not a finger pointed at errors to be fixed or a reflection on past mistakes to make way for more improvements but a “struggle for other futures” (Suoranta, et al., 2022, p. 229). *If* our purpose in education is one of justice and equity for all children, the stories point to conflicts and anomalies that *cannot be resolved within a model of imposition* – that is, science as an authority and education as transmission. However, for fundamental change (revolutions) to become possible, what is not working in schools must be seen *as an important failure of purpose* (the *idea* that drives or guides us) rather than a technical puzzle to be solved. Until that happens, all new ideas (including mine if it is not, rather, discarded entirely as insufficiently proven or inadequately argued) are subsumed within the existing model as another solution to optimize, improve, or refine the way things are.

If we dream of *other* futures for children, we cannot simply do better at what we have always done (Stengers, 2018), for example, by directing the teacher to know and teach new things (antiracism, gender diversity, online safety, the pros and cons of AI tools) or to teach in

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new ways (inquiry, gamification, nanolearning) so that, with these improvements (if they are made correctly), all students can become successful (in the way success is defined for them).

Again, this is not to speak *against* conventional research but to bring attention to the impact of its imposition for teachers and, therefore, students. *If* we believe that teaching is a complex, subtle and *significant* art, we cannot authorize education researchers to authorize what teachers should do or to accept, as John Hattie who argues, the answer to the problems of teaching is *simple* – that “if your teaching practice is not having an effect on your students’ performance, you must change” (in Evans, 2012, para. 26). He has recently published a sequel to his highly regarded previous meta-analysis of what works in teaching (Hattie, 2009). His latest book is informed by more than 2,100 meta-analyses about achievement drawn from more than 130,000 studies and conducted with the participation of more than 400 million students aged three to 25 (Hattie, 2023). It offers more answers to what teachers need to change *to*: they should include in their practice, among other things, flipped learning, rehearsal strategies, cognitive task analysis, jigsaw methods, success criteria, direct instruction, spaced practice, improved parent relationships. The list is long and precise.

Hattie’s list is just a cornice, if you will, added to the burgeoning edifices of educational research. More often than not, however, the additions are inconsistent with one another. There are many, certainly, who disagree with Hattie’s conclusions, and despite what he argues is a preponderance of proof, they offer different calculations. The experiences of teaching in the vital contact between teacher and students and the *purpose* for our gathering together are lost in the noise generated.

Yet perhaps (and this has been the bet of this research) the very confusion and felt conflict between dreams and actuality might return attention to important failures. Copernicus,

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who saw the proliferation of calculations that did not explain what *mattered* in astronomy, observes, “it is as though an artist were to gather the hands, feet, head and other members for his images from diverse models, each part excellently drawn, but not related to a single body, and since they in no way match each other, the result would be monster rather than man” (quoted in Kuhn, 1995, p. 83). This sense, that nothing makes sense *together* is one, perhaps, that we shy away from because it is coupled with the feeling, too, that there is no way out of the maze. We can no longer imagine escape. Einstein, in observing the inconsistencies and failures of Newtonian physics, writes, “It was as if the ground had been pulled out from under one, with no firm foundation to be seen anywhere, upon which one could have built” (quoted in Kuhn, 1995, p. 83).

Conventional education research and its application in practice keeps building on the foundation as if it were firm, adding more and more evidence to “the constellation of facts, theories, and methods collected in current texts” (Kuhn, 1996, p. 102). Yet it is only when what is not working is seen as an important failure, rather than elements to alter, improve or fix *within* the constellation, that the need for what Kuhn (1996) calls “a reconstruction of the field from new fundamentals” (p. 85) becomes apparent. Such a reconstruction is *not* an addition to the cumulative process. In conventional research, cumulative addition – progress – is not only familiar but foundational. Research, and therefore education, is improvement through addition or correction to what is already known. The textbooks of the researcher’s education provide the basis to which additions can be made (Kuhn, 1996). New research provides addenda and new chapters, but the core of the textbook remains the same.

Thus, in training new teachers at my university in the past two decades, for example, new courses on Indigenous ways of knowing, inclusive practices, and technology have been added to

the existing program and revised texts provided. As long as the practice of teaching remains the same, additions are helpful; they are new tools for our toolbelt, and our capacity to do the job is increased. We can do what we have always done, but do it better, faster, more effectively. The challenge is when we have outgrown old ideas and they can no longer serve our purpose, or when what is added no longer fits and we have to grow up into new ideas. Certainly, Indigenous ways of knowing, inclusive practices, and today's far-reaching and wide-ranging technology cannot be *added* – they require a growing up and out of previous thinking.

Revolutionary research (and speculative research might be understood as foraging for what will revolutionize)⁶³ does not seek to add but to see otherwise, and from that seeing, Kuhn argues, will change the field entirely. However, that change, he says, is not begun by the discovery of new *proof* – which, after all, is an addition – but rather about premises and as such is “a prelude to the possibility of proof” (p. 199). It is, after all, only when we agree on those premises that data *becomes* visible: “Scientists do not see something *as* something else; instead, they simply see it” (p. 85). To see, Kuhn (1996) argues, necessitates a “conversion experience that cannot be forced” (p. 151). Just being *told* that our current way of thinking does not fit all the facts (as I keep telling it; old habits are hard to break) is not enough. After all, the facts *do* fit the idea we hold as long as we continue to recast failures as puzzles to solve rather than important failures (curmudgeonly teachers, recalcitrant students, the continued hold of colonial practices).

Kuhn notes that to think differently demands a “gestalt switch” (p. 204). Indeed, he points to the insufficiency of mere *intellectual* acceptance in which one uses a new idea, but only

⁶³ A revolution in educative terms is not fixing what is broken but growing up into more expansive, just and equitable ways. In that sense, education is ongoingly revolutionary and teachers, as I've said before, are revolutionaries.

in a “parasitic” way: the person “lacks the constellation of mental sets which future members of the community will acquire through education.... Neither good reasons nor translation constitute conversion” (p. 204). Knowing more is not enough or only good enough for acquiescence, for example, in the case of inclusion in education, putting up new posters or changing the format of report cards or using updated vocabulary (people first language and gender-neutral pronouns) without the change of heart (that is, conversion) necessary for action. As Chris Argyris’ (1991) research reveals, people, especially, he argues, highly trained professionals, routinely *espouse* a new theory and use it for “identifying and correcting errors in the external environment” (para. 3) but continue to *act* with the theory they have always used, that is, the theory with which they have become successful.

Indeed, it is very possible (even commonplace) to agree with ideas without converting to them, to pay lip-service to them or to assimilate them as a new element – an addition – the “the newest new” (Kuntz & St. Pierre, 2021, p. 478) within the *existing* constellation. The latter often seems like conversion, at least conversion in the evangelical sense. A new method, for example, for teaching reading has been found and its converts are zealous, calling down fire and brimstone on anyone who does not convert with them. On a Facebook group for advocates of the science of reading, for example, members post dire consequences for students from a continued “mishmash” approach of ineffective reading instruction, including depression, anxiety and lifelong difficulties with health and happiness (Science of Reading-British Columbia, n.d.).

These converts know *the* answer and therefore feel duty-bound to get others to follow them. Indeed, the existing framework of progress where, through education, some people come to know better than others (thanks to ongoing current research) and therefore tell those who do not yet know how to do better (those whose knowledge or practices are inadequate or not yet

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optimal) encourages zealotry. Now that access to information is a click away, zealotry proliferates, and because everyone has a podium, the noise is deafening. Even a century ago, Dewey (1929b) saw the danger and one of his reasons for developing a new science for education was to *counter* zealotry, to stand against the operations of people who inspire “slavish imitation partisanship” (p. 11) and their followers who repeat their thoughts rather than using the insights from them to attend to matters of concern. Instead of science as *certifying* claims, however, Dewey (1929c), in his dreams of otherwise, saw a possibility for science to make evident that we are all “subject to the uncertainties of an indeterminate future” (p. 308), so that the enmity between us would cease since “inevitable uncertainties of existence would be coeval with a sense of common effort and shared destiny” (p. 308). The ideas and hypotheses of science, then, would *not* provide answers:

They open new points of view ... liberate us from the bondage of habit which is always closing in on us, restricting our vision both of what is and of what the actual may become. They direct operations that reveal new truths and new possibilities. They enable us to escape from the pressure of immediate circumstance and provincial boundaries. (p. 310)

And every significant advance in science, he adds, issues from “a new audacity of imagination” that begins with “speculative hypotheses” (p. 310).

For the education we dream of for our children it is not enough to simply know more from within the same constellation of facts, theories, and methods but to step into new beginnings where new solutions are possible to other questions that, as poet David Whyte (1993) says, “have patiently / waited” for us (lines 28-29).

Conversion is not a matter of fact but a matter of faith in our common effort and shared destiny.

Another Model

In the new model I have imagined, education is understood as a work of art and teachers, its practitioners; a teachers' science is invented to develop and support that practice – which is a practice of love. But love is not a matter of fact; it is a matter of faith always.

"Faith," William James (1912) argues, "means belief in something concerning which doubt is still theoretically possible; and as the test of belief is *willingness to act* [emphasis added], one may say that faith is the readiness to act in a cause the prosperous issue of which is not certified to us in advance" (p. 524). Often science is seen as a process of certifying what works in advance of our action, as putting "a stamp of final approval upon this and that specific procedure" (Dewey, 1929b, p. 15) so that we may act with confidence. Yet the person who embraces the invention of a new science, a revolutionary science, Kuhn (1995) says, "must often do so in defiance of the evidence provided by problem-solving.... A decision of that kind can only be made on faith" (p. 158). Although a crisis caused by proliferating anomalies and discordance between solutions can succeed in a loosening of rules, and a willingness, for example, to accept new methods, "crisis alone is not enough" (p. 158), Kuhn argues. More significantly, he says, there must be a new model to think with and, in order to take up that model, he adds:

There must also be a basis, though it need be neither rational nor ultimately correct, for faith in the particular candidate chosen. Something must make at least a few scientists feel that the new proposal is on the right track, and sometimes it is only personal and inarticulate aesthetic considerations that can do that. (p. 158).

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I have first tried to make the anomalies and discordances felt (the important failures) by both telling my story and by inviting you to become the story with me. This first stage of any revolution is the sense that there is something wrong, and, as important, and even implicit in that noticing, that something better is possible, even if that better is yet confused or vague to us. Yet, after a long struggle, after pointing over and over to the wrongness, I have come to realize, that to *do* something, we must *concretely* imagine otherwise: we must have a *different* idea for how to go on. Thus, I invented a teachers' science, a model for it, something with which to think and make otherwise, built upon a different foundation than other sciences of education and thus an attempt to connect with a different constellation of facts, theories, and methods or rather, connected *differently* to prior constellations, a model that might address what continues to trouble us in education. Indeed, to become successful, a new paradigm, Kuhn (1995) observes, "must promise to preserve a relatively large part of the concrete problem-solving ability that has accrued to science through its predecessors" (p. 169). *In the model for a teachers' science, everything already known contributes still but its contributions are a source rather than authority.* All our prior work, yours, mine, our ancestors, even, or perhaps especially, our failures, too, become gifts with which other futures can be made possible.

A model, however, is not something we prove but is *a prelude to proof*. I make no claim that the model I created is complete or already correct or even rational, if rational means using "objective" thought. However, such a limit on reason is unreasonable, Ursula Le Guin (1986) argues. The true discourse of reason, she says, is "the marriage of the public discourse and the private experience, making a power, a beautiful thing" (para. 21). A teachers' science *marries* its art. I am not sure what will come of that marriage, but it must be a marriage between equals, a marriage of love which is, as Octavio Paz (1995) puts it, "a knot made of two intertwined

freedoms” (p. 152). Still, if we send our children to school because we love them and long for better living for them, I have faith that the model is on the right track. A model, even though it is not yet proven, even though it is simplistic yet, even incorrect in some respects, can give us a start for a new direction for action, this track that feels right to us, because, it is more beautiful, this aesthetic consideration, which, as physicist Murray Gell-Mann (2007) argues, is a better indicator than what we can prove so far. The beautiful, perhaps, is a manifestation of that in which we may place faith (Weil, 1977). Thus, even when it *contradicts* current experimental evidence, we believe it is worth acting on. However, without a model (map, theory, mindset, paradigm), we have nothing concrete with which to act otherwise.

Yet familiar ideas, because they are embedded within a constellation of connections that form the mindset or dispositions or habits through which we see, are hard, hard, hard to loosen. Ptolemy’s geocentric model of the movements of the planets lasted for 1500 years. It was developed from two tenacious ideas: that the motion of the universe within the immutable celestial sphere, because it is itself perfect (heavenly), would move in perfect circular motion, and that the earth, because it is where humans are, is the centre of the universe. Whenever new data revealed inconsistencies, the seeming retrograde motion of planets, for example, it was accounted for by epicycles, mathematical calculations of perfect smaller circular motions upon the perfect circular motion. In some cases, there were epicycles on epicycles. The model became more and more complicated, but it was made to *work*: it explained the data and people could use it to navigate their world even though, as we now know, it was completely wrong. This would have become evident to them if they were navigating space but since travel was as yet terrestrial only, despite the increasing complexity of the calculations and the necessary increase in expertise for those calculations, this was not yet an important failure. They continued to acquiesce in what

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was established, routine, and, despite its artificial complexity, because *habitual*, it was easier than thinking otherwise (Dewey, 1938).

Education today is still making corrections to improve the model Dewey (1938) describes as the traditional model:

The main purpose is to prepare the young for future responsibilities and for success in life, by means of acquisition of the organized bodies of information and prepared forms of skill.... Since the subject matter as well as standards of proper conduct are handed down from the past, the attitude of pupils must...be one of docility, receptivity and obedience. Books, especially textbooks, are the chief representatives of... wisdom of the past, while teachers ...are the agents through which knowledge and skills are communicated and rules of conduct enforced. (p. 18)

Although today the standards are “handed down” from “current” research rather than what is now considered “tradition,” they are nonetheless based on and built upon prior (past) research. Neither this “upgrade,” nor the addition of multimodal texts and their wider possibilities or even virtual classrooms nor the subsequent additional roles and expectations for teachers alters the model: some are authorized to “hand down,” others to receive. Indeed, the framework remains substantially unchanged despite decades of additions that fix, improve, enhance or correct aspects of it, and teaching becomes more and more complicated, as epicycles on epicycles are added to keep the model working in consonance with what is known about learning, about development, about environmental and genetic influences, as societal expectations change, as technology upends notions of time and space, as we move out of our earthly classrooms and into the ether. Yet teaching, because it is an *agent* of research only, cannot change until the model changes.

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Again, for a new idea, more information is unnecessary – only speculative audacity. When Copernicus presented his heliocentric model (he was not the first to do so; ideas percolate and must wait, often, for the complementary conditions to add themselves [James, 1981/1907]), it was not because it offered new data or even made more accurate sense of the current data. However, he speculated, he had a better *idea* to begin from. The sun was bigger and more significant than earth; it was the source of growth. But once in place, the idea made other thinking possible, including, some years later, Kepler's revisiting the other idea of Ptolemaic theory (that the heavenly sphere moved in a circular motion). It was not until Galileo's observations with his new telescope that data was revealed to begin to *prove* the model.⁶⁴ Yet by using his observations to make the heliocentric model actual, by acting on its ideas, Galileo was imprisoned for heresy.

We cling fast to the familiar and become, in effect, imprisoned by the ideas we make; that imprisonment, made actual in Galileo's case, continues day-to-day for those who no one even notices.

For fundamental change in education, change that makes visible the important failures that the current model cannot see, and its additions cannot solve, we need to set aside the idea that knowing more is its *sine qua non*. We need a new idea at the heart of our education research and that idea must be an educational one.

⁶⁴ "Can it conceivably be an accident," Kuhn (1996) asks, "that Western astronomers first saw change in the previously immutable heavens during the half-century after Copernicus' new paradigm was first proposed? The Chinese, whose cosmological beliefs did not preclude celestial change, had recorded the appearance of many new stars in the heavens at a much earlier date (p. 116). In other words, it is not the technology (the telescope) that allows us to see anew, but the idea. Without technology, some things cannot be seen, but without an idea that they *can* be seen, no matter how powerful our tools, they remain invisible to us.

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The answer I have proposed is as obvious as the sun: the source of growth for our children is love – which is not a matter of fact but of faith.⁶⁵ Yet without love our children will not thrive; they will not flourish; they will not grow. We do not send our children to school so they can know better but so they can live better. We do not send our children to school to be improved or to prepare them for the future but to allow them to continue to grow in the richest, most fruitful way so they can create a more beautiful future for themselves and others. We do not send children to school to learn to navigate a world that existed when we grew up or the one, even, that we live in today, but in new worlds, worlds we can only dream for them.

Yet for such possibility, I am proposing not only a revolution in science, that is, a conversion from one paradigm to another, but teachers' science *as* revolutionary. Education is, in itself, a process of opening so that grownupness (of children, of teachers, of knowledges, of institutions) is possible. Grownupness is *ongoing conversion*. It is insufficient to know about an expanded and expanding universe yet to continue to think and live as though we can know its whole, or to believe in the possibility of freedom and justice, yet support, maintain or even lead a system where some of us are deemed more capable and therefore control others. In other words, to know intellectually but without acting upon – using – what one now knows.

As Kuhn's investigation into the development of science concludes, conversion is not arrived at by mere accumulation. This is the case not only for scientific revolutions, which are, surely, simply learning writ large, but the way a child learns, a teacher, you, me. To learn something *significant* is always a conversion from one way of thinking to another. Education *is*

⁶⁵ This is not to say that there is no research that is finding facts that support the idea of love as necessary for growth but the facts about love are insufficient for acting on love. Indeed, if we wait for all the facts to come in or argue against other facts that prove other sources for growth, we remain in the frame that "knowing better" is more important than love, which, over and above any facts, is a matter of faith.

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the revolution – a path toward new and more fruitful beginnings – and a teachers' science an ongoing source for conversion, opening new points of view and new possibilities, so that we do not fall into bondage of old habits or imprison ourselves behind limited and limiting boundaries that thwart us in our common effort and shared destiny (Dewey, 1929c).

A science for the art of teaching, therefore, cannot settle into a new but different pattern, a different set of instructions to follow: it must remain open. To be of use, it must itself be revolutionary to ongoingly abet the revolution of education, not as an event of change toward a different stability but a process that supports the ongoing change of living in desirable (loving) directions. To live well in a changing world – and this is our dream for our children – it is necessary that they come to know the greatest number of possibilities rather than a prescribed and already known path, to learn how to choose better paths rather than accept how to go on as told, and to attend to the consequences of those choices in a widening expansiveness, not just for themselves, but for those with whom they live, not just those near, but for starfish, ancestors, children of the future, far-off planets, and kin deep below the sea's surface with whom we are all inextricably entangled. A revolutionary science steps out to the edge of knowing, open always for something else, so that the next choices may be better ones.

I am not offering a new idea for adding to and fitting within science as we now know it but shifting the constellation of science in education, this way of finding things out, to fit *within* the practice of teaching – this practice of love where our children are.

Yet a new model, too, as I have said, is insufficient for conversion, even if many people agree with it. Consider models of inclusion as practiced within the framework of knowing better and thereby absorbed into what it seeks to change. Or how technologies, once dreamed of as tools of transformation, have become “a bulwark of reaction” (Papert & Roszak, 1997, p. 7); or

how practices of inquiry or openness or care or Indigenization or decolonization are exploited for improving, monitoring, and measuring teaching, an application, an optimization, an addition to what is.

For a revolution, that is, *fundamental* change, a *revelation* is necessary first.

Revelation

To convert to another way – which is not just a way of thinking but *a way of being alive* (Merton, 1979) – for making the model (this speculative proposition) *actual*, it is necessary to bring that new way into interactions *in* the world, to find ways for others to *feel* it so that what is otherwise can become in our making together. As a Mowachaht/Muchalaht Elder said to me recently, we already have plenty of good words. Yet no fundamental change *becomes* of them.

When people listen to ideas (inventions, speculations) of otherwise, they most often listen (unsurprisingly) to understand how to fit (assimilate) what is said into what they already know, discarding what does not, and if they find points of agreement, extracting them to improve, alter or augment what they are already doing.⁶⁶ This way of listening is woven into procedure in the paradigm of modern science, that is, what Thomas Kuhn (1996) describes as “its constellation of beliefs, values, techniques, and so on shared by members of a given community” (Kuhn, 1996, p. 175), and this dissertation, I realize now, is, in essence, an application to become a member of the community of education researchers (scientists). A science, Kuhn says, to *be* a science, is not only the “sole arbiter of professional achievement” (p. 168), but also “the group’s members, as individuals and by virtue of their shared training and experience, must be seen as the sole

⁶⁶ In a letter to her parents, Simone Weil (1974) writes of the polite remarks about her work made by others, “after which, they listen to me or read me with the same hurried attention which they give to everything, making up their minds definitely about each separate little hint of an idea as soon as it appears: ‘I agree with this’, ‘I don’t agree with that’, ‘this is marvellous’, ‘that is completely idiotic’ ... In the end they say: ‘Very interesting’ and pass on to something else. They have avoided fatigue” (p. 196-197).

possessors of the rules of the game or of some equivalent basis for unequivocal judgments” (p. 168). Information from outside the game cannot change the game, nor are its members trained to change it. Indeed, they are trained to *maintain* it. As Kuhn notes, it is most likely someone with little prior practice who notices the rules “no longer define a playable game and to conceive another set that can replace them” (p. 90).

Moreover, those well trained in the game, the paradigm or set of paradigms, the “constituents of that disciplinary matrix” (Kuhn, 1996, p. 182) that forms the whole that functions together, are also the ones who benefit most from it; it works for them. The “conceptual fabric” used in the matrix has “not yet confronted them with difficulties” (Kuhn, 1978, p. 264). Indeed, this is the case, not only for education researchers, but for all of us who work within the educational system, even if we disagree intellectually with all or some of the current model. I have tried to imagine another model that does not demand the replacement of other ideas (an argument against) only their re-placing so that opening is possible. It does necessitate, however, the displacement of those who require that their theory of reading, writing, how to learn math, how to implement technology, how to teach students with autism – or even, how to conduct educational research – is the *authorized* theory; their theory can only be one theory amongst many that may be useful, and more, to become useful, it must be useful for teachers in their actual practice. None of us can be a sole arbiter but given the uncertainties of existence, only a partner in our “common effort and shared destiny” (Dewey, 1929c, p. 308). Thus, it is not a model that rejects or reduces choice but one that creates a denser web of possibilities for teaching such that a contribution from science is an enhancement and, too, itself gains new vitality: in the process of interaction with practice, it is made richer, stronger, thicker. The model is, perhaps, a continuation of the shift that Copernicus imagined, a growing up from

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the human who knows better as the seat of control of the universe to humans as part of a vast universe.

Yet it is little wonder that few risk otherwise when what-is works (at least for us) so far. It feels safer to go along, to cling to the benefits that to come to us from the way it is. Conversion – which is not taking up a new variant of the already-known but to step into an uncharted otherwise – is always risky. Of course, so, too, is what we deem safe. As James Baldwin (1963) writes: “Renewal becomes impossible if one supposes things to be constant that are not – safety, for example, or money, or power. One clings then to chimeras, by which one can only be betrayed, and the entire hope – the entire possibility – of freedom disappears” (p. 100). Prison becomes a sanctuary.

Before conversion, however, before a willingness to act on faith, as “a prelude to the possibility of proof” (Kuhn, 1996, p. 199) – because there *is* no proof – thought experiments can help us feel the contradictions of the model that still works for us or that we think we can continue to *make* work. Or that we cling to because otherwise seems impossible. The function of a thought experiment, Kuhn (1978) argues, “is to assist in the elimination of prior confusion by forcing the scientist to recognize contradictions that had been inherent in [their] way of thinking from the start” (p. 242). Again, these contradictions cannot merely be understood intellectually: they must be felt. Arguably, a lack of feeling the idea of inclusion in schools, of converting to it, of thinking with and through it, is why it remains, for the most part, in policy only in schools, and not in practice. Even though my students can speak of inclusion, it is similar to the way that many of Harvard professor Eric Mazur’s (2000) physics students answered exam questions about Galileo’s theory of falling bodies, that is, to correctly perform for the test. However, when asked outside of the context of the exam, more than half of Mazur’s students, he discovered, still

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understood the world with Aristotelian logic. Even when they were asked to imagine, first, that there was no air resistance, they answered that when two balls of equal size and smoothness hit the ground, the heavier one would land first. After all, this answer works in the day-to-day of their living here on earth.

In the day-to-day of classrooms, it works – if working means that students are successful at complying with and completing our demands – to reward students for good behaviour, to give them tasks that keep them busy, to sort students into levelled groups, to follow scripted programs in teaching, to get students to complete workbooks or their online variations. and to use testing as a means to incentivize compliance. “What do you think about this (levelled and scripted) literacy program?” one of our newly graduated and newly hired students asked us. It is as if, entering the closed atmosphere of schools, she could no longer imagine the weightlessness of other theories that she had nodded along to at the university, and even now, espouses. Yet as long as accepted educational research smooths over or ignores or calculates out the anomalous, the unpredictable, and the incalculable, as long as the very thrust of evidence based research generates what works from an analysis of what is already known to suggest that teaching can (and even ought to) become generic enough to scale up for mass distribution, shelf-ready, its various aspects interchangeable such that a simple upgrade or addition of programs, strategies, technologies can improve its overall working (and ongoing advancements are now accelerated with generative AI), then teachers will continue to accept authorization from what is “certified” to work to minimize difficulties and maximize success. Inclusion, which demands a deep awareness of, even reverence for, diversity, remains an idea only.

A thought experiment, Kuhn (1978) explains, does not discover new information nor does it demand additional data for its development, and indeed must “present a normal situation,

that is, a situation which the [person] who analyzes the experiment feels well equipped by prior experience to handle” (p. 242). Thus, he says, “because it embodies no new information about the world, a thought experiment can teach nothing that was not known before. Or, rather, it can teach nothing about the world. Instead, it teaches the scientist about [their] mental apparatus” (p. 242). This feels contrary to the role of scientific research which is more often understood as producing new knowledge or correcting or adding to what is already known. Yet as Dewey (1931) argues, our “prevailing mentality” (p. 55) is the ideology (or paradigm) through which we see the world. To see otherwise, a new idea is necessary that is outside of that mentality. Almost a century ago, Dewey argued that our prevailing mentality is “the ‘business mind’ which has become deplorably pervasive” (p. 55). There is little to suggest that this mentality has changed.

However, at the same time, a new idea (ideal, in the case of education, since any idea for it must, surely, be desirable), Dewey (1931) argues, must be capable of existing in the world we already know; it must feel *do-able* to us:

Ideals express possibilities; but they are genuine ideals only in so far as they are possibilities of what is now moving. Imagination can set them free from their encumbrances and project them as a guide in attention to what now exists. But, save as they are related to actualities, they are pictures in a dream. (p. 138)

A thought experiment, therefore, although speculative and therefore necessarily fiction, is not imagining another world but another way to see *this* world. Although I have tried to expose unresolved anomalies of current educational sciences and sketched out a different model for another science, it is important to make both the contradictions of current sciences, and the possibilities of a teachers’ science acutely *felt*. Reasons are insufficient. Without a felt sense that

acting upon it is not only do-able, but that it is *inconceivable* to continue to act otherwise, conversion is impossible, and Dewey's beautiful idea will sink once more into obscurity.

The surprise of my research, however, has been the growing awareness that my long efforts to change education were aimed at the wrong audience – teachers. The conversion necessary is further upstream. Unless those who arbitrate the rules of the game convert, then change, or rather *fundamental* change, is blocked.⁶⁷ Yet how can researchers *feel* that not only does research perpetuate the idea of knowledge as transmission through its mode of solution, even when it argues against it, but that whatever knowledge is generated cannot be taken up by teachers – and therefore students – since it exists outside the flow of living where the experiences of teaching move? Teachers sit through presentations, for example, that explain trauma but wonder how they are going to teach with or through the information, what exactly they will do differently now, how they will go on. The information developed elsewhere, well-ordered, well-argued, well-supported seems unrelated, or at least unrelatable to their actual and always turbulent experiences. The mindset of research, however, is that it has only to produce information, or a program developed from it, and teachers can apply or implement it to improve their practice as though teaching, like engineering, is an application of knowledge to build better humans. If it does not work, teachers must try harder or check to ensure they have not missed steps or know even more or *change*. After all, the information provided by research is *proven*,

⁶⁷ In *A Room of One's Own*, which is not only a speculative intervention, but a kind of thought experiment, Virginia Woolf both reveals the errors and contradictions of the way it is and points to another way entirely, not one that was already true, but one that could be made true by living women. Her audience, however, is women, not the men who are comfortable as they are and with the way it is. Thus, despite Woolf's explicit warnings not to go to university where that way prevailed, women added themselves. As Isabelle Stengers and Vinciane Despret (2014) argue, they enclosed themselves within the "stifling impotence created by the 'no possibility to do otherwise, whether we want it or not,' which now reigns everywhere" (p. 162). But there *are* other ways.

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albeit from the high dry ground above the flux of things where, in Bruno Latour's (2000) expression, "things strike back."

Latour points out that in the physical sciences, "microbes, electrons, rock seams...are utterly uninterested in what human scientists have to say about them.... They will have no scruples whatsoever in objecting to the scientist's claim by behaving in the most undisciplined ways, blocking the experiment, disappearing from view, dying, refusing to replicate, or exploding the laboratory to pieces" (p. 116). In the case of social science research, however, uninterest on the part of its subjects is unlikely. In many cases, what has been proved to be effective has been proven outside of living places where things strike back – variations on surveys and interviews where respondents very often simply "go along" with researchers (there are many reasons to do so: to get "done," for example, or to please, or to get ahead) or they might even agree to whatever is proposed, but the agreement is disconnected from their actions. They agree intellectually only: they do not or cannot act upon the idea. Or if the research is proven by observations in living places, the tangle of variables is impossible to recreate elsewhere and lifting any one variable as more important to "implant" can only "take" insofar as it is abetted by all the others. Thus extracted, it does not work. In other words, no matter how much information teachers get or how it is proved elsewhere, the knowledge only rarely enters their "heart, head and hands" (Dewey, 1929b, p. 76). Thus, their practice does not change. They remain unconverted and will continue to be until research *itself* converts.

The purpose of the thought experiments here is to provoke a revelation – a shock to thought – through exposing the contradictions in research between ideals of inclusion and modes of imposition; the confusion between notions of teaching to diversity and teaching as generic, and between a practice of love and a practice that produces useful citizens who will "become the

powerful learners, skilled workers and engaged citizens we want them to be” (OECD, 2012, p. 2).

However, it is remarkably easy to block a revelation. Whatever we currently believe, if we believe it wholeheartedly, is the most significant block, especially since revelations, like love (as love), require an attentiveness from us that is far different from expeditious extraction of key idea. Before engaging with the thought experiments, therefore, it is important to consider what might prevent seeing otherwise – the revelation - without which the thought experiments will make little sense and can be easily disregarded. To convert, we must be disposed to do so. We must be willing to believe otherwise, to surrender control, and to shift out of a business – or business as usual – mindset. None of these dispositions are expected for understanding research – quite otherwise. It is important, therefore, to slow down to think about each of these dispositions, without which, a revelation, and therefore conversion, is blocked.

Will to believe To convert, or at least to become open to the possibility of conversion, it is necessary not only to feel that what-is is inadequate or insufficient or *wrong*, but to also believe that an otherwise, *through our own actions*, is possible. The will to believe, William James (1912) argues, is not simply “our faith in some one else’s faith” (p. 9) nor is it even a faith that we *can* arrive at certitude, but faith, rather, that our opinions (beliefs) *can* grow more true, and that, although “to hold any one of them ... as if it never could be reinterpretable or corrigible” (p. 14) will lead us astray, “the quest or hope of truth itself” (p. 17) is not only worthwhile but *paramount* for better living.

One must be willing to believe that *different orders of truth* are possible (James, 1902).

For conversion to a teachers’ science, it is necessary to let go, or at least suspend, a belief that we *already know* what is necessary (and true) for effective education and that any problems

that arise can be solved through methods already known or through the (more precise) application of (the latest) knowledge already available. Even more difficult, for conversion to become possible, education researchers must let go of the belief that knowing is the *end* of education and begin to imagine it as intermediate in the process: we know in order to make use of that knowledge for better living. The knowledge itself is only as useful as it is useful and, too, what we know now is only ever a pebble on the beach of the vast ocean beyond it. More, for a teachers' science, it is necessary to believe that each of us – not just those who are authorized as experts – contributes toward the quest for better living and, therefore, what is rational is not limited to the best *proven* reasons (Le Guin, 1986), which is a particular kind of reasoning, what John Caputo (2000) calls the institutionalization of reason, but can also be understood, as Dewey (1922) suggests, as “the attainment of a working harmony among diverse desires” (p. 196).

Yet the idea that knowing more is the highest good and, indeed, that it is possible to know best via improved (approved) methods, as I have said, is so deeply planted in every aspect of education that it is taken for granted – and from that foundational belief, the assumption that those who come to know more can – and even, ought to – dictate to those who know less. The teachers in the remote community I visited, for example, all agreed that they must know more about trauma and nodded along when the well-known trauma researcher flown in at great expense (who, as an expert, knows more than they do about trauma) delivered her polished presentation. They were anxious to find something that would fix the problems caused by the impact of intergenerational trauma, although based on the muttering around the coffee urn, they were not very hopeful and there was a row of curmudgeons, arms crossed, at the back of the room. For these teachers, every day is another explosion, and they are exhausted. Children who

struggle with school or who are suffering strike back with great frequency.⁶⁸ They have become utterly uninterested in what teachers have to say to them – or about them. Research concludes that the problems can be resolved if the teachers just know more. In a recent (approved) dissertation, the researcher argues:

The more a person understands, the stronger and more knowledgeable they become. By educating the teachers in terms of trauma, we can replace preconceived biases about behaviours and learning and replace them with facts about the impact of trauma and how it affects the students they serve. Professional development for teachers is imperative in changing practice and in informing educators to best serve their students (LeBlanc, 2023, p. 115-116).

Yet it does not work. We cannot simply “remove” biases, like worn out parts of a machine, and “replace” them with updated parts, and then, once “fixed” with this better knowing, teaching will run smoothly.

To be knowledgeable about trauma – I have been knowledgeable about trauma, knowledgeable enough to lead professional development and give lectures – does not equip me to teach someone who has experienced trauma. Knowing is only a *beginning*. Although without knowing, our beginning places might be less fruitful or more limited, the greater danger is that I think what is known, what can be or has been explained, is the end. That I *now* know. If someone is suffering, I know nothing. What is more, their suffering has no words, except the cry, “Why am I being hurt?” (Weil, 1977). Their suffering cannot be *explained*. What I have heard from

⁶⁸ Poignantly, Janusz Korczak (1967) writes, “There are some rare children whose age is not just their own ten years. They carry the load of many generations . . . Under the action of a slight stimulus is released the latent potential of pain, grievance, anger, and rebellion. The disproportion between the small stimulus and their violent reaction is amazing. It is not a child but the centuries weeping” (p. 261). In Indigenous communities in Canada, it is a rare child who does not carry such a load.

those who have been hurt can only be represented here as a gash, a tear, as tears: to say the suffering for them, to give words to their suffering, to use it as an argument, is to trivialize it and to betray those who suffer. To offer to fix what is irreparable is not only arrogant but disdainful – as though *I* know what is needed to solve whatever is wrong. What is needed, what is *imperative*, Simone Weil (1977) argues, is not *already knowing*, but “attentive silence in which this faint and inept cry can make itself heard; and ... institutions are needed of a sort which will, in so far as possible, put power into the hands of [those] who are able and anxious to hear and understand it” (p. 316). The trouble is, she says, “They are far removed from it by the circumstances of their life; but even if they are in close contact with it or have recently experienced it themselves, they are still remote from it because they put it at a distance at the first possible moment” (p. 327) – as though in so doing they can, themselves, escape affliction.

Yet in our entangled living, if some of us are suffering, all of us are suffering. When we grow up into the idea of our common destiny, we no longer think of problems – refusals, forsaken cries, explosions – as something to fix, improve, smooth over, order, organize with packaged solutions if possible, or exclude and ignore if not, but as pregnant with possibilities that might open into more fruitful paths for other futures.

The concern of this research, therefore, is not to convert teachers to come to know better what can be understood with uncluttered clarity from the high ground of research's precise explanations derived from within its carefully constructed boundaries but to bring research into the flux and flow of living. We do not need teachers who know better but researchers who listen better, not in an academic sense of taking notes, analysing, organizing, writing up, but attentively, unlearning, or at least suspending for a time, their own limited knowing, so that what they hear moves out of the intellectual only and into their hearts and hands. To do so they must

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leap *with* teachers from the high banks where they feel safe. To leap, they must have faith that in so doing, they are moving in the direction of a more just, more loving, more beautiful living into the future.

But first, to make that leap, they (you) must be *willing* to believe an otherwise is not only desirable but *possible*.

Will to surrender What is made from knowing is not a function of science itself but of art, the art of the utilization of knowledge (Whitehead, 1929a), where, poet Jean Lescure observes, knowledge and skill are *expressed*, not applied; art (and teaching is an art) demands “a difficult transcendence of knowledge” (Lescure quoted in Bachelard, 1964, p 16), that is, to surpass or overflow limits, limits that are often so familiar to us that, like air, we dismiss the role they play in the restriction of our movement. Science gathers its knowledge in the still places, in the eddies that form in the flow of living or gentle pools of temporary shelter built by dams where we can accumulate nourishment for next adventures. Stillness, however, cannot be sustained in living: we must move or die.

No matter how much evidence is gathered or how careful our explanations, it is insufficient for conversion – or learning or growing – which *moves* us. Argument, like acquiescence (which is its pole, a lack of argument) is a pattern of stillness. As Michel Serres (1995) points out:

Debate brings pressure to bear, which always tends to confirm accepted ideas. It exacerbates them, vitrifies them, constructs and closes off lobbying groups. At the very most it sometimes chisels out clarifications, but it never makes discoveries.... Discussion conserves. (Serres, 1995, p. 37)

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It dams what might flow beyond it. Discussion is critique, a judgement. It already knows. At best, as Erin Manning (2016) says, it “asks *what if* from the solid stance of the *it is*. It does not risk the *what else*” (p. 202). When we argue we stay in a pattern of stillness.

I cannot argue for conversion.

Conversion begins in surrender.

To convert we must surrender to not-knowing to know otherwise.

Yet this surrender is very different from accepting the knowing of another (a doctor, a teacher, a parent, an advisor, a zealous colleague) which keeps one within the already known. Faith, William James (1912) notes, is not “submitted to as an imposition of necessity” (p. 5) but rather is both voluntary and *felicitous*, a submission “to an unseen order, and that our supreme good lies in harmoniously adjusting ourselves thereto” (p. 53). Such a surrender echoes the description by painter and writer Henry Miller (1946):

When you surrender, the problem ceases to exist. Try to solve it, or conquer it, and you only set up more resistance. I am very certain now that... if I truly become what I wish to be, the burden will fall away. The most difficult thing to admit, and to realize with one's whole being, is that you alone control nothing. To be able to put yourself in tune or rhythm with the forces beyond, which are the truly operative ones, that is the task — and the solution, if we can speak of “solutions.” (p. 375)

When we surrender, Leonard Cohen says, although we know only that we cannot solve or reconcile our problems, in the very affirmation that we cannot, we transcend (in McKenna, 1988).

Surrender to the not-known, like consent to what we know so far so we can act *together*, “is not passive agreement but a both wilful and transformative acceptance” (Debaise & Stengers,

2022, p. 408). It is affirmation, Erin Manning (2016) says, which “does not position: it experiments” (p. 201). Its movement is not conflict resolution or problem solving but “one of mutual inclusion” (p. 202).

Yet although conversion is not based on proven facts, it is not fanciful: whatever needs to be known is already there to be known. Again, as poet Audre Lorde (1984) reminds us, “There are no new ideas still waiting in the wings to save us... There are only old and forgotten ones, new combinations, extrapolations and recognitions from within ourselves, along with the renewed courage to try them out” (p. 38).

The courage to let go – and leap.

Will to shift mindset The abiding challenge of this research, however, is that although it is not teachers who must convert, but research itself, to do so, researchers must feel the contradictions of their research from within teaching itself. Yet, as Kuhn (1978) points out, unless they have significant experience, they are “not yet prepared to learn from thought experiments alone” (p. 265). Thought experiments as an aid to conversion, although making felt the experiences that are of a concern for a teacher, might be outside the experience of researchers. After all, education researchers need little specialized knowledge or experience in teaching itself. Thus, thought experiments in teaching, which demand that the researcher think about a *familiar* situation, one that they feel “well equipped by prior experience to handle” (Kuhn, 1978, p. 242), poses difficulties. A reading researcher, for example, may have limited experience of teaching at the K-12 level where “things strike back” much more regularly than at universities where those who might do so have been systematically excluded through failing grades and those who remain have more than a decade of experience in acquiescing in the rules of the game and succeeding at it. Thus, the researcher might have difficulty imagining

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themselves into the experience of teaching, for example, in a multigrade primary class in a remote British Columbia school. Indeed, to become a researcher, a concern I have already expressed, one must gain wider experience not in teaching, the thing itself of education, but in methods from other research areas. There is a danger that knowing, therefore, is always only intellectual.

Nonetheless, we all have experiences of teaching and learning, of being in schools ourselves, as well as of feelings of failure and frustration and success and joy from those experiences. Indeed, in many ways, the greater our perceived experience, the more difficult it is to convert to a different mindset, not only because our current way of thinking has *worked* for us (hence our advancement in our field – and education, of course, is the root of every field) but because the way of thinking (the idea, the paradigm, the mindset) becomes like air to us; we no longer feel its friction. The everydayness of teaching means we have less difficulty imagining ourselves into an experiment of being a teacher, and if we are already teachers, imagining ourselves as teachers of other students in other circumstances, than it would be to imagine a world without air resistance. Yet this familiarity can further impede conversion. Its very ordinariness makes the mindset that underpins our usual ways of understanding teaching, if felt at all, feel inescapable.

One of the disadvantages of the current enthusiasm for current research is that the current mindset is thereby further locked in. Unless, like me, you have been thinking with another century, you might not feel the shock I did when listening to education researcher Chris Dede (2022) speaking about artificial intelligence (or, as he argues, intelligence augmentation). He asks educators to consider what business we are in and concludes:

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We are not in the education business. We are not in the classroom business, the campus business, the degree business, the high stakes test business; we are in the learning business and that is a very different business than the education business. (43:40)

The question itself leads us astray: we are not in a business at all.

Yet a business mindset prevails. In business, the producer is separate from the consumer, such that the concerns of the consumer are not of concern to the producer – only their *consumption* of what is produced.⁶⁹ Indeed, the consumer must become convinced that their concerns are in alignment with the producer's. In the education business (however named), students are its consumers and education (or learning or degrees) an industry that “sells” its products to them.⁷⁰ Teachers are the intermediaries, the brokers, the distributors, the sales agents, their worth measured in product sold and customer satisfaction and, at universities, in the number and ranking of their publications, which is a form of advertising to increase the number of consumers.⁷¹ Education has become synonymous with economic prosperity, the higher the education, the higher the pay for work, and higher pay with happiness.

This last gives us pause. We want our children to be (safely) happy and we have come to believe that money will buy happiness. Although perhaps the wisest parent would see the loopholes in the promise that if children do as they are told in school, they will graduate to get good jobs and therefore make more money and lead happy lives, it is difficult to let go of the fear

⁶⁹ In a [LinkedIn post](#), Sarah Knowles points out that “Chat GPT created the biggest essay fabricator going, and now also cornering the market on software to detect student plagiarism.” In other words, it first sold us what has become the problem and is now selling the solution to that created problem. Its goal is to ongoingly fuel consumption of its product; its concerns are in no way educational.

⁷⁰ Again, there is also the multi-billion dollar business of selling to education (to schools and universities) as consumer (Forecasts, 2024-2032, 2024).

⁷¹ As such, they must be “on trend” to follow, what Petar Jandrić (2023) calls, the latest research hype that brings in cash (publications, in other words). This is very different from following one's special devotions and is a corporatization of professionalism that moves it even further from the “love and unquenchable interest” (Said, 1977, p. 5) of the amateur.

that to do otherwise is dangerous for them and even destructive of the possibility for future happiness. "Our worries are buttons that are easily pushed" (para. 6), Autumn Caines (2021) notes in her work at the intersection of technology and education, especially with our children, and therefore we are susceptible to implausible even impossible guarantees from those who tell us they have what we need to ensure "everything will work out." After all, research has *evidence* that economic prosperity which is fuelled by educational success makes us happy (Frijters, et al., 2019). The measurement routinely used as proof is a response to a single question – how satisfied are you with your life? – and its conclusions drawn through comparison of factors like income and education, making correlations based on similarities (those with higher incomes have higher educational attainment and report higher satisfaction with their life). However, it does not ask a grownup question, an educational question, that is, how satisfied are you that your life is desirable not only for you but for the others (human and other than human) with whom you are inextricably bound? The narrower question leads us astray. What is more, researchers are coming to understand that whom they ask their question to matters. Outside of the globalized mainstream where business mindsets prevail, among small-scale societies with low incomes, high life satisfaction exists, too (Galbraith, et al., 2024), and that satisfaction cannot be correlated with economic success.

Unless we imagine ourselves outside of the mindset that prevents us from seeing other possibilities and therefore other futures, we remain trapped in the maze of its constellations. Not only do we see the separation of research (producers) and teaching (distributors to student consumers) as "good business," but our very love for our children keeps us in its frame. Indeed, if their happiness rests with a high income and education is the path there, anything that gets in the way of this single trajectory is the problem that needs to be solved. Other concerns are cast as

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frivolous and our very care is “weaponized,” Caines (2021) argues, and used, for example, to sell a range of surveillance technologies from baby monitors at home to learning analytics in schools. Thus, the applications of science, which as Richard Feynman (1998) reminds us, “carries with it no instructions on how to use it, whether to use it for good or for evil” (p. 5), fall prey to the influence of “private advantage and power” (Dewey, 1929a, p. 81).

Yet if education concerns itself with a long look, a wide look, looking up and out, any life satisfaction procured at the expense of others is dangerous to our children, disastrous in the same way a wholesale clearcutting of forests is or dumping our garbage into the sea. More than a century ago, William James (1902) noted that “the prevalent fear of poverty among the educated classes is the worst moral disease from which our civilization suffers” (p. 369). If education is not merely a foot soldier for business but a process of living – which is surely wider than business – business models will not do.

However, such explanations (again!) are insufficient for conversion.

A thought experiment must be more uncomfortable. It cannot allow us to merely nod along intellectually but to *feel* the contradictions and confusions in our current thinking so that it becomes not only visible to us, but *impossible* to continue.

To that end, and taking into consideration the concerns expressed, I have chosen four stories – after all, fiction, as Virginia Woolf (1928) notes, “is likely to contain more truth than fact” (p. 6) and indeed, as Ruha Benjamin (2016) argues, “social change requires novel fictions that reimagine and rework all that is taken for granted about the current structure of society” (p. 1). However, she adds, “Such narratives are not meant to convince others of what is, but to expand our own visions of what is possible” (p. 1). This is, of course, the *work* of fiction, even when, as in this case, it is making a science. Fiction is “seeing the world through someone else's

eyes, feeling it with someone else's heart" (Kidd, 2005, para. 8) and thereby into our own transformation and a more expansive world (Butler, 2013). Conversion, in other words. These thought experiments are meant to provoke or awaken *from* what is and *to* an otherwise that is a new beginning for other making.

But I cannot convince you that it is better. You must see – be struck by – its light.

Each thought experiment, here, set in the actual, expresses teaching as a practice of love against the backdrop of preparing students for a successful (prosperous) future. The first is a historical story, its consequences already known, and therefore might be felt as more veracious; the second is adapted from my own experience and, I hope, felt as authentic, the third, is a story that is concerned with some of our greatest concerns in education. Although it has not yet happened, it could: it opens into the possibilities we could make together. These three stories begin at the university and therefore near where researchers are, where they have the most experience, and from which they might see themselves, and feel for themselves from *inside* experiences of teaching. The last story is an important failure and as such, "more than a thing to ignore" ((Mukhopadhyay & Savarese, 2010, para. 15). I am still learning its miracle.

Miracles as Thought Experiments

For those who are comfortable with the way it is, who benefit most from it, who, as arbiters of the rules of its game, even dictate the way it is, conversion is not only difficult, it is threatening. Indeed, as physicist Max Planck (1949) remarks in his autobiography, "a new scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die, and a new generation grows up that is familiar with it" (pp. 33-34). It is unsurprising, then, that conversion, if it comes at all, comes by way of miracle.

Although the word is seldom used in secular research, and certainly not by Thomas Kuhn, what else can one call what provokes the seemingly sudden and inexplicable seeing of “the light” of a new idea, even though there is no proof for it, even if it contradicts proof, and the only thing we can say is that it is more beautiful. Yet because of it, we are willing to let go of what we once thought and did (all the rules of the game as we thought it had to be played) to think and do otherwise.

Miracles, William James (1902) says, “open out the possibility of other orders of truth” (p. 423). The conversion wrought by a miracle is not understood “by deliberation and interpretation” (Kuhn, 1996, p. 122) nor is it a product of imagination, but rather of what William James (1902) calls mystical feeling, that is, a “feeling of enlargement, union, and emancipation” (p. 425). For the “willingness to act irrevocably” (James, 1912, p. 3) on an idea that so comes to us, especially those of us who are comfortable with the way it is, he argues, it “must come to the individual with the force of a revelation” (James, 1902, p. 113). The more sedimented our thinking, and here, where education itself becomes the sediment, the bricking up, the wall beyond which we cannot imagine, the more difficult conversion becomes, not because miracles do not abound, but our capacity to see them is diminished. A miracle *violates* expectations. A miracle is the way of instantaneous conversion, James (1912) argues, and while his concern is with religious conversion, miracles and the mystical feelings that make them visible have no content⁷²: “One must have an awareness that ‘rational consciousness’ as we call it, is but one special type of consciousness, whilst all about it, parted from it by the flimsiest of

⁷² I make note of this to open the scope of the word conversion, not to reject or apologize for the religious. As Petar Jandrić observes of his own prior rejection of religious concepts: “I inadvertently succumbed to the academic sin of thinking about the world through the lens of my own worldview and trapped myself into my own little epistemic cocoon which firmly excluded myth, belief, and religion” (McLaren & Jandrić, 2020, p. 255).

screens, there lie potential forms of consciousness entirely different” (p. 388). Indeed, to perceive the miraculous (the unexpected that exceeds what we now know or understand, something more magnificent and magnanimous), James argues, one’s own conscious fields must have, he says, not a “hard rind...that resists incursions” but rather “a leaky or pervious margin” (p. 242) so what is otherwise, even if only seen in glimpses and flashes, can be *felt*.

Lately, I have been wondering if all art (including teaching) are ways of telling miracles and if a miracle is “a wick of desire,” in Adrienne Rich’s (1993) words, that reminds us “where and when and how you are living and might live” (p. 241). It does not offer new information, “for you have known, somehow, all along, and maybe lost track” (p. 241). Miracles, then, are an unexpected shift that realign constellations already known or a sudden remembering of what is long forgotten, a rupture, as Michel Serres (1995) argues, that reveals “slow and viscous fluxes” (p. 139) so often imperceptible to us, something greater to which we, too, are intimately connected.

A wick lit can set off revolutions.

The force of a miracle is the revelation and its marker, beauty. Indeed, Simone Weil (1977) argues that “beauty is a providential dispensation by which truth and justice, while still unrecognized, call silently for our attention” (p. 341). Miracles, however, and therefore revolutions, which go by way of miracles, are inexplicable and are therefore swept out of the tidy stories science tells. As Thomas Kuhn (1996) points out, the “tendency to make the development of science linear, hides a process that lies at the heart of the most significant episodes of scientific development” (p. 140) thereby rendering “revolutions invisible” (p.140). They are disguised, he says, in textbooks, which aim to quickly and efficiently get the students “up to speed” in current developments. As he points out, “Why, after all, should the student of physics,

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for example, read the works of Newton, Faraday, Einstein, or Schrödinger, when everything [they] need to know about these works is recapitulated in a far briefer, more precise, and more systematic form in a number of up-to-date textbooks?" (p. 165). All the important failures are erased (they are unnecessary to the efficient consumption of what is now known), and so, too, the miracles. Yet in this way, science, which has become an authority over, and therefore a limit to education, is, in turn, limited by it. Instead of becoming what Dewey (1934) calls "coefficients in new adventures" (p. 63), they are codependent in cycles of closure and erasure: my father's laughter extinguished in the back row, Lily's tears, the silent cry of a suffering child as we sail calmly on, as we gather data and develop programs, as we progress.

Yet teaching *depends* on touching the living source of knowledge, the imaginative consideration of it, such that it is a "lighted torch" (Whitehead, 1929a, p. 97) that passes hand to hand through generations. When what is learned is sanitized, organized, complete, and ready to be consumed, the torch Whitehead (1929a) describes as "a dangerous gift, which has started many a conflagration" (p. 101) is doused. What matters in what passes from teacher to student is not the thing made (the information, however it is organized and delivered) but what it can light.

If you are a teacher, then you already know that you can tell students about something over and over to no avail (not matter how expertly you deliver the information, how appealingly you package it) and then, one day, and you can never be certain if it is because of the way the sun shone through the window or the soft words of a dear friend who lifted a fear you knew nothing about or that somehow you managed, at last, to tell the old knowledge "with the freshness of its immediate importance" (Whitehead, 1929a, p. 98), but you suddenly see the light of it shine in their eyes: *they see the light*. This miracle cannot be satisfactorily explained but it happens, whatever happens, and what they did not know before, and even seemed unlikely to

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ever come to know, they now know absolutely. This is different from the superficial and transient knowing necessary to perform for a test, or, too, from the solidification of knowledge through the training, extension and refinement of the already known, but is transformative.

Miraculous.

As long as research says learning is a linear and expected progression and teaching technical, transformation is blocked; as long as education remains trapped within science, science, too, is trapped.

I hope to reveal, with these thought experiments, that in continuing thus, in starting from the premise that knowing better is the end of education, our dreams together for other futures are blocked.

I long for you to see, irrevocably, that love, which is both a miracle and a begetter of miracles, is the door through which all learning passes. Knowing better is not the *foundation* of education; it is a *source* for our practice of love.

Thus, each of the four thought experiment that follow, is a story of a miracle which is, after all, where conversion begins when conversion seems most impossible.

Indeed, with these thought experiments, I want to show that teaching goes by way of miracles.

Out of Limits and Loitering In the courses I teach at the university, however, the focus is not on miracles. Students want to know how to get children to act as expected, to do what is expected, to meet expectations, to possibly exceed expectations but only so far as can be inscribed in a rubric – that is, expected excess. In their classrooms they create charts of expected and unexpected behaviours.

The unexpected is something to avoid.

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(I think of everything missed from any list of expectations: sudden birdsong, a soft orange sunrise, a smile from a stranger, the first taste of fresh pineapple, the laughter of a quiet child. Or here, when we insist that research go as expected and everything unexpected is expected to be left out.)

The questions of pre-service teachers – “How do I get children to meet expectations, to learn to read, to calculate, to finish their worksheets, to follow directions, to *improve*?” – indicate, not only that they see the unexpected as an interruption to smooth functioning, but that they understand teaching as technical, something that can be made to work efficiently, and learning as a linear progression from one concept to the next. The children can be sorted and organized within the expectations and the goal of teaching is the successful arrival of all students at predetermined destinations: reading (at grade level), completion of assignments (that indicate the student has achieved pre-set learning outcomes), compliance (to expectations). Provided (by me!) with the right answers, they believe their classrooms will run like clockwork, predictable, stable, harmonious, and their students will be successful, go on to higher education, get good jobs, and be happy. Indeed, the proof of both good teaching and good learning is smooth and steady progress, the faster the better, the way science progresses – or seems to, as Kuhn (1996) describes it: “One by one, in a process often compared to the addition of bricks to a building, scientists have added another fact, concept, law, or theory to the body of information supplied in the contemporary science text. But,” he adds, “that is not the way a science develops” (p. 140). And certainly, it is not how a child develops.

Yet even the practicing teachers I teach in post-degree programs have versions of the how-do-I-get-students-to questions. They see the rich variations of learning, the failures/miracles, the detours, wonderings, wanderings of individual paths and pace of their own

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classrooms as problems to fix. One teacher said that she wanted to know from me how to diagnose the difficulties each student has with learning and to be provided with the appropriate interventions for each difficulty so she can get even her most struggling students to learn, or rather – because I think learning is much wider than what she described – to progress more quickly toward prescribed destinations.

Meanwhile in classrooms (as in laboratories) no matter how much we know, how carefully we plan, how much evidence supports our every move, things strike back: an angry parent, an incompetent administrator, a grieving child, our own inadequate responses in the face of what we cannot expect.⁷³ As long as we see the explosions as something that can be fixed (with a course, a program, an intervention) or ignored (either entirely dismissed as an anomaly – an unimportant failure – or as an exception outside of expectations requiring expertise from elsewhere) rather than something (miraculous even) through which we can imagine otherwise, we cannot move: we remain in the eddy, the currents of current thinking.

Miracles, however, do not fit within smooth functioning. They cannot be scheduled or plotted at regular intervals along the line of progression. They are not on the line at all, nor can they be expected, except insofar as the unexpected is always expected. “The time has to be right,” anthropologist Loren Eiseley (1978) writes, “one has to be, by chance or intention, upon the border of two worlds. And sometimes these two borders may shift or interpenetrate and one sees the miraculous” (p. 29). The speculative (and education, surely, is speculative) attempts this interpenetration, inquiring in the space between the imagined otherwise and the existing actual,

⁷³ Dan McQuillan points out that AI, because it is trained on what is “expected,” is *fragile*: “it’s quite brittle and it’s pretty unreliable. It breaks, and it tends to break in ways that have more harmful impacts on people who are already vulnerable” (McQuillan, Jarke, & Pargman, 2023, p. 361). People, too, who are trained only in how to manage or coerce the expected, become fragile teachers: they are constantly buffeted by explosions and their own “breakdowns” tend to do most harm to students who are already harmed by school.

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between the fictional and factual, between the past and the future, the old and the new, and here, in this space between you and me as we sit together at the kitchen table still, lingering long over the coffee cups, elbows on the table, open to whatever comes from the stories told.⁷⁴ The intention, surely, of speculation is to find (be found by) miracles. Yet just as the path between marked borders is unmapped, the right time is not clock time. One must be patient and attentive in the way that Simone Weil (1977) describes: “Our thought should be empty, waiting, not seeking anything, but ready to receive in its naked truth the object that is to penetrate it” (p. 49).

My students at the university, however, are in a hurry. They are confused when I answer “I don’t know” to their questions. They have been taught to believe that to teach is to explain so the student can come to know the answers. They are keen, in their own future teaching, to make the explanations more fun, more relevant, more interesting than their own teachers did, to ensure that all their students can learn how to learn as efficiently and effectively as possible (the more quickly one can learn the better) but they rarely question that there are answers or that the point of an education is to receive them. What good is a teacher, they wonder, who knows nothing – or rather, who cannot know *for* them.

They expect an *injection* of knowledge, instant, quick, painless – not the slow processes of growth, the intimate and intricate necessity of connections, relationships, the tangled interplay of ideas and experiences, the difficulty, the care required. They want drive-through knowledge.

They do not want to be left behind.

They have no time to waste.

⁷⁴ Serres (1995) describes the spaces between physical and social science as “more fractal than truly simple. Less a juncture under control than an adventure to be had. This is an area strangely void of explorers” (p. 70).

Yet the concern that brings us together here is that we are hurrying in the wrong direction. To see another direction, it is necessary to slow down, even to loiter where we are now to wait for miracles that light other ways to other worlds.

Poet Ross Gay (2019a) writes about loitering in his *Book of Delights*, a series of essayettes he wrote, one a day, about something delightful. Delight, surely, is the wellspring of desire, without which growth is arrested or diminished (Dewey, 1929b; Weil, 1977). Delight, however, is different from the “fun” that my students want to add to their teaching practice – games, rewards, entertainment – to get their student to do what they want them to do (to meet a prescribed outcome, to finish the assigned work, to accurately repeat explanations in the tests they devise) or to be (productive, persistent, compliant, kind to others). Delight demands *loitering*: to “linger, loaf, laze, lounge, lollygag, dawdle, amble, saunter, meander, putter, dillydally, and mosey” (Gay, 2019a, p. 230).

Delight upsets, Gay (2019a) argues, the productivity models of the pervasive business mindset. He adds that “the darker your skin, the more likely you are to be ‘loitering’” (p. 231). “Some people,” he (2019b) observes, “are asked to move along more than other people, because our gathering is even more frightening, more alarming” (9:54). So, for example, the banning of the potlatch:

The government of Sir John A. Macdonald (who called the potlatch “a debauchery of the worst kind”) banned the potlatch in 1884 – on the grounds that it and similar ceremonies encouraged barbarity, idleness and waste, interfered with more productive activities and generally discouraged acculturation. (Francis, 1992, p. 99)

And some people never get a chance to loiter. If they work two jobs, for example, and have people to care for in between those jobs. Or if they must go along in order to get ahead. Or if

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they are always catching up. I remember once, long ago, a day's skiing. I was with a group of friends who were all much better at skiing than I. On the way down the mountain, they left me in a flurry of white powder, promising to wait for me ahead. Just as I would come upon them, a group of lollygaggers, laughing, basking in the bright sun, leaning on their poles, they would set off again. I, grimly determined, would continue, legs shaking with fatigue, bruised from fall after fall, following. Again and again, I would reach them, hear their laughter and ease just ahead, and off they would go.

There was no delight in the day for me.

I sat, recently, in a grade one classroom: hurry, hurry, hurry, put away your bags, get to your seats, hands folded. Be ready. Get started. Hurry, hurry, only a few minutes left. If you are done, you may go to the carpet and play. If you are not done, you will have to stay in at recess to finish. Hurry, hurry.

This kind of hurrying is well-meant. Teachers are told over and over that if children *fall behind* (this most ominous kind of falling) their future success is in jeopardy (they will not *get ahead*): dreadful statistics toll ill-health, poverty, incarceration, drug addiction if teachers cannot ensure their students read by the end of grade three, know their math facts, self-regulate, follow directions (Unicef, 2016; World Literacy Foundation, 2018; NDRC, 2023).

I can still see the grim faces of the little children bent over their worksheets. There is no delight in the day for the children who are always catching up. Or for their teachers who are catching them up.

In my work, now, the not-yet teachers at the university ask me questions as though knowing answers will get them up to speed so they, too, can get ahead.

“What do you do,” one of them said, “when a student isn't finished?”

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“Is it important that the student finish?” I responded.

It was the strangest feeling. The sudden deep quiet. It was like I had set off a bomb in the classroom and everyone was staring in shock at the wreckage. I wondered, shocked by their shock, what I had wrecked.

The student finally spoke into the hush. “But,” she said, “isn’t finishing *necessary*? Won’t students just do *nothing* if we say they don’t have to finish?”

A thousand words pushed forward, rushing, jumbled, tumbling past each other, half-formed, dark with something nameless. I settled at last on saying, “Is what they are doing worth finishing?”

Poet Rita Dove says, “What a poem does is open something up inside.... A poem is an experience, because when you experience, it allows you to become larger” (quoted in Masciotra, 2017, para. 11). So, too, in teaching (which, like poetry, is an art) and miracles (which are an enlargement): the experience opens, widens, expands. Yet I watch children in hurry, hurry classrooms shrink, disappear, become a problem, a label, an unfinished worksheet. They cannot keep up, keep time, be on time, which, as Ross Gay (2019a), notes “points to another synonym for loitering ... *taking one’s time*” (p. 232). Or in the case of miracles, moving *out* of time.

Long ago, when I was a student myself in the education program, a not-yet teacher learning to become, there was an Indigenous woman in our class, a dark contrast to an all-white cohort. For the morning class, she was often late. She always seemed bewildered by the instructor’s annoyance, which swelled, day by day, until rage. An explosion. And then she disappeared.

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At high schools, almost every staff meeting is taken up by what to do with students who are late. New schemes are always in place (we spend so much of our time keeping time). I recently ran into a high school principal I once worked with. “Shelley Belezny,” he said, “I haven’t seen you for years. I was thinking about you the other day. Your words were echoing in my mind when we were talking in the staff meeting about a new late policy. You always said to just welcome children who are late.”

I do not remember saying that. What I do remember is this conversation with a student.

“You are always late for the morning class. Why?”

“I work until 2am and it is hard to wake up.”

“Can you consider not taking these late shifts?”

“My brother and I get hungry. I am the only one making money. My mother,” he paused and looked away before continuing, “is not well.”

The question about how to get students to be on time so they can get ahead leads us astray. We need to ask instead, whose time are we keeping? And why? Who are we leaving behind? Where are we hurrying to? What is missed in timekeeping?

My students’ how-do-I-get-them-to questions assume that the answers can be found external to their own hands and hearts and without consideration of child or context. The better knowing is out there, fixed and true in the ether and their task is to gather it up as quickly and as efficiently as possible while they are at university.

In a post-degree program, a teacher wanted a solution from me for a problem in her practice: “How do I get my student who is in grade eight and still struggles with simple computation to progress?” The others in the class nodded. They, too, wanted the answer. Instead of offering strategies, I told a miracle – James Baldwin’s (1985) story:

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The never-to-be-forgotten Mr. Porter, my black math teacher, who soon gave up any attempt to teach me math. I had been born, apparently, with some kind of deformity that resulted in a total inability to count. From arithmetic to geometry, I never passed a single test. Porter took his failure very well and compensated for it by helping me run the school magazine. He assigned me a story about Harlem for this magazine, a story that he insisted demanded serious research. Porter took me downtown to the main branch of the public library at Forty-second Street and waited for me while I began my research. He was very proud of the story I eventually turned in. But I was so terrified that afternoon that I vomited all over his shoes in the subway.

The teachers I am talking about accepted my limits. I could begin to accept them without shame. I could trust them when they suggested the possibilities open to me...

I was an exceedingly shy, withdrawn, and uneasy student. Yet my teachers somehow made me believe that I could learn. And when I could scarcely see for myself any future at all, my teachers told me that the future was mine. (pp. 662)

After the telling, there was a pause before a tentative hand: "So," one said, "are you saying that all we need to do is find a child's passions and allow them to follow them?"

"Like maybe do an inventory of their likes and dislikes at the beginning of the year?" another chimed in.

"Or, do you think," another offered tentatively, "that if he got *proper* teaching, that with today's *advanced* research, he would be better at math?"

Another hand shot up: "Should we limit children? Isn't anything possible if we just apply the right strategies? I mean, wouldn't his future be better if he learned math?"

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A great deal of nodding and another hand, “If he were so anxious that he vomited, isn’t this an indication that this activity is too far outside of his zone of proximal development?”

“How does this story tell us how to teach math?” another asked, an edge of criticism creeping into his voice. “He doesn’t teach math. Is that what you are saying?”

I did not know how to explain – and I know, now, explanation is inadequate anyway. Indeed, what needs to be known must be felt.

Can you feel it?

Can you imagine James Baldwin, that uneasy child, sitting in another classroom, not Mr. Porter’s, but with a different teacher, more skilled at teaching math, using a different method, a better method, one based on the latest evidence (although which evidence for which method, I leave you to decide) or using new technologies that derived just-right practice for him from a myriad of taken data. Imagine him, over and above this more expert instruction, also receiving intervention for intensive additional support as recommended by research. Perhaps he is pulled out of class for remedial instruction (during a course he is already good at like English) or kept in after school for tutoring instead of running the school magazine. Imagine that he indeed became better at math, not exceptional at it, but able to pass tests, at least.

Can you feel the *weight* of it?

He would learn, not that he was *already* worthy, but that he was defective, this great shame, and needed to be fixed at great effort. He would learn that his gifts were secondary to his deficiency, a deficiency so *important* that it needed to be remedied to make him of worth.

Thomas Merton (1985) writes,

I cannot find myself in myself, but only in another. My true meaning and worth are shown to me not in my estimate of myself, but in the eyes of the one who loves me; and

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that one must love me as I am, with my faults and limitations, revealing to me the truth that these faults and limitations cannot destroy my worth in their eyes; and that I am therefore valuable as a person, in spite of my shortcomings, in spite of the imperfections of my exterior “package.” The package is totally unimportant. What matters is the infinitely precious message which I can discover only in my love for another person. And this message, this secret, is not fully revealed to me unless at the same time I am able to see and understand the mysterious and unique worth of the one I love. (p. 35).

James Baldwin understood and acknowledged the worth of Mr. Porter even though he failed to teach him math and Mr. Potter saw his failure not as a failure of the child who must be fixed at any cost but as an opportunity for other futures. He did not leave him in the corner with simplified worksheets or throw up his hands and say, as my father’s teacher did, washing her hands of him: “Just sit quietly. You are too stupid to learn anyway.” (The words, of course, do not have to be said for the message to be clear.) Mr. Porter looked up and out to find James Baldwin desirable difficulties and those experiences were a moving force into his future and through him, for many others, rewriting trajectories of success as shifted constellations in more fruitful, more creative, more beautiful directions.

If a teacher is not a mechanic or an engineer but an artist who, in love, with love, creates beautiful experiences that live fruitfully into the future, then what is the role of a researcher? Certainly, research might continue to make better and better tools available for the teacher, but it cannot dictate *the making*. It cannot tell Mr. Porter how to teach math. It cannot *explain* teaching. In considering art critics (and much education research fills the role of criticism), Tolstoy (1904b) asks, “What do they explain? The artist, if a real artist, has by his work transmitted to others the feeling he experienced. What is there, then, to explain?” (p. 119). Once an artist

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(teacher) follows the instructions (evaluations) of the critic, they cease to be an artist and are capable only of what Tolstoy calls “cold brain spun work” (p. 121). If one thinks of the function of criticism, however, in the manner that Matthew Arnold (1865/1974) did, not as explaining art or prescribing for it, but as “a disinterested endeavour to learn and propagate the best that is known and thought in the world, and thus to establish a current of fresh and true ideas” (p. 1399), it might be a generative way to consider the role of researcher in a teachers’ science. In intimate interaction with the teacher, research might *support* the *living* making of teaching so that its direction is ongoingly revised and refreshed with the best that we know so far.

What is needed for a child, however, is created by feel.

“Feeling is not after the fact – it is what moves the act,” Erin Manning (2016) points out and what “feels right” must be in the hands and heart of those who are making.

In his solution for teaching James Baldwin, Mr. Porter found what Tolstoy (1904b) calls, “the infinitely minute degree” (p. 125) necessary to his work as teacher:

It is the same in all arts: a wee bit lighter, a wee bit darker, a wee bit higher, lower, to the right or the left in painting; a wee bit weaker or stronger in intonation, or a wee bit sooner or later in dramatic art; a wee bit omitted, over-emphasized, or exaggerated in poetry, and there is no contagion. Infection is only obtained when an artist finds those infinitely minute degrees of which a work of art consists, and only to the extent to which [they] find them. And it is quite impossible to teach people by external means to find these minute degrees: they can only be found when a [person] yields to [their] feelings. (p. 125)

What a teacher must feel is love, not sentimental love, which, as Dewey (2003) points out, divorces feeling from action (EW.5.93), nor love in what Baldwin (1963) calls “the infantile

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American sense of being made happy but in the tough and universal sense of quest and daring and growth” (p. 103).⁷⁵ In other words, love as enacted, as living into its responsibilities.

Perhaps the miracle is that we already know how to love and that love, when you loiter in the moment, when you look up and out, is as common – and as miraculous – as grass.

What I cannot explain is exactly how the miracle happens that becomes something beautiful. This is what my students want from me – and perhaps from life, too – for someone who is superior in knowledge to tell them how to go on. And while they wait for instructions, miracles pass by them and important failures that might signal other futures remain unnoticed.

We do not have words for what we cannot yet explain. Except at the tip of our tongues. Except in our hearts, in our hands, in our longings. But the miracle of Mr. Porter’s teaching was a lighted torch that set off the revolution that James Baldwin lived and that continues to live through his writings.

I wonder if Mr. Porter saw James Baldwin’s future unfold. By and large, we teach blind and perhaps that explains the desire to have some tokens of “success,” the test scores and “feedback” from surveys and polls, a thin and meagre data carefully husbanded.

I recently listened again to the “exceedingly shy, withdrawn, and uneasy student” (Baldwin, 1985, p. 662) debate William F. Buckley at Cambridge University in 1965 on the topic of whether or not “the American Dream is at the expense of the American Negro.” In describing the expense, Baldwin “leaves aside” the data and the very leaving aside speaks louder than any graphs, forcing us, too, to leave aside *reasons* as what is necessary for justice – and thus arrives at the heart of the matter:

⁷⁵ Infantilized people are easy to tell what to do; research that tells us how to be “happy” and how it is “good for us” to be happy colludes in that infantilization. Similarly, love, which can drive out hate, is cut off from its power (that is action) when it is sentimentalized or when it is cast as sentimental - and therefore not connected with what is scientific.

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Leaving aside all the physical facts that one can quote. Leaving aside, rape or murder. Leaving aside the bloody catalogue of oppression, which we are in one way too familiar with already, what this does to the subjugated, the most private, the most serious thing this does to the subjugated, is to destroy his sense of reality.... And the most serious effect of the mill you've been through is, again, not the catalogue of disaster, the policemen, the taxi drivers, the waiters, the landlady, the landlord, the banks, the insurance companies, the millions of details, twenty-four hours of every day, which spell out to you that you are a worthless human being. It is not that. It's by that time that you've begun to see it happening, in your daughter or your son, or your niece or your nephew. You are thirty by now and nothing you have done has helped to escape the trap. But what is worse than that, is that nothing you have done, and as far as you can tell, nothing you can do, will save your son or your daughter from meeting the same disaster and not impossibly coming to the same end. (17:45 - 20:50)

What matters is that this trap is destructive for everyone. Living orders created by "literally millions of almost infinitesimal acts" (Alexander, 1974/2023, p. 249) encompass all that is living, this "inescapable web of mutuality" (King, 1963/1977, p. 468). In reflecting on the sheriff who used a cattle prod against a woman's breasts, he says: "What happens to the woman is ghastly. What happens to the man who does it is in some ways much, much worse" (25:30).

Baldwin's argument is not a critique, which can only divide us against each other, but a commoning, so that those who inflict the suffering share the weight and the consequences of the suffering. Commoning is not possible with hate, only love. It is not possible, either, with reasoning or by arguing about rights which, Simone Weil (1977) notes is "linked with the notion of sharing out, of exchange, of measured quantity. It has a commercial flavour, especially

evocative of legal claims and arguments. Rights are always asserted in a tone of contention” (p. 323). There is nothing *reasonable* about suffering. As Baldwin writes (1962), “It demands great spiritual resilience not to hate the hater whose foot is on your neck, and an even greater miracle of perception and charity not to teach your child to hate” (para. 46).

The important failure I want my students to see is not that math scores are dropping against international standards or that effective strategies for numeracy acquisition are not routinely used in high school classrooms but that, despite our advanced knowledge, updated curricula, decolonization, and antiracism strategies, and leaving aside data and arguments to prove it – after all, we are now “drowning in ‘the facts’ of inequality and injustice” (Benjamin, 2016, p. 2) – violence persists today. What avail is it for our children to win prescribed amounts of information about math when their souls are endangered (Dewey, 1929b) and the very dream of better living extinguished? One can replace 1965 with today’s date and Baldwin’s words still ring true:

This is being done, after all, not a hundred years ago, but in 1965, in a country which is blessed with what we call prosperity, a word we won’t examine too closely; with a certain kind of social coherence, which calls itself a civilized nation, and which espouses the notion of the freedom of the world.

Yet our hurry to fix things, to seek retribution, to demand urgency, only keeps us imprisoned in the maze our fathers have made.

And yet – can you feel it – with love, which is a knot between intertwined freedoms (Paz, 1995) and always miraculous, we act irrevocably, here, now, not because there is *proof* that its way is better, but because to do otherwise is *unthinkable*.

Methods for Reading My students are most eager to learn how to teach reading (and I am, after all, often considered an expert in literacy), even my post-degree students, who tell me that their previous university professors never told them anything *useful*. They all want the textbook version from me, without any loitering, what *works*, the *latest* research on how brains acquire the ability to read, about structured literacy, systemic, sequential, and cumulative approaches to phonological awareness, fluency and comprehension, how to use strategies of direct and explicit teaching, effective tools for diagnosis and intervention.

I give them links to a variety of resources (information is abundant) and tell them the miracle of Roland.

Roland was a child with a genetic condition which causes complex challenges including physical deformities and severe learning difficulties. In grade seven, he was still an emergent reader and writer, despite extensive learning support and interventions since kindergarten. His main strategy for coping was refusal. Since he generally refused to leave the classroom for remediation, he stayed with me most of the day and I did my best to find ways that allowed him to both participate meaningfully with the other students and to continue his learning development, including applying the latest research and newest technologies in an effort to teach him to read. He responded to those efforts, by and large, with refusals.

Our school, at the time, had a “no hats” policy and Roland had scalp psoriasis that was often severe. Annie was sitting behind Roland during a particularly bad outbreak, and on that day – perhaps she had been kept awake late into the night in the small apartment she lived with her mother and three younger siblings – she said loudly that she would not sit there anymore because it was disgusting to look at his head. Roland immediately shut down, pulling his coat over his head, and did not emerge until it was time to go home. He did not come to school the next day.

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I decided to talk openly with the children. Even though most of them had been at school with Roland since kindergarten, I reviewed the medical aspects of his condition, explaining why he was different and said that what was the same for him was that he wanted to belong, to be cared about, to learn just like each of them. I told them it was heartbreaking to me to see him so unhappy every day and, to my dismay, I became too choked with tears to continue. The children listened to me with that thick silence that happens sometimes when hearts open.

The next day, they all made an effort. They greeted him in the morning, they invited him to play foursquare at recess, they responded to his questions, they cheerfully worked as his partner in paired discussions. I can still remember his look, the disbelief, the dawning joy. I did not think it would last and was anticipating new pain, but some months later I looked out the window one morning before school and realized that what I saw had become ordinary: Roland was laughing and playing with a group of boys.

And then, blossoming in the warmth of community, he started reading and writing. He began by reading the room, particularly the name cards, he participated in brainstorming and often came up with unique ideas that prompted interesting discussions, he agreed to write, first copying from the board, then on his own. He went on field trips for the first time since he started school and even took a role in our play at the Christmas concert. He flourished.

“I get it,” one of my students said, “this shows how social-emotional learning is important. There is so much research on this now.”

“I always start my year with a unit on kindness,” another added. “Maybe if we read more books that feature students with disabilities?”

“Yes,” another confirmed. “There is a lot of research to show that students need to see themselves in the literature in order to feel a part of the community.”

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They rush to fill in the blanks as though the story is an answer to their questions, as though the story explains methods for optimizing learning progress.

I want to say that it tells of something more intimate.

Or more sacred.

In describing how a scientist learns to practise as a scientist – which is different from gaining the information about their science through textbooks – Thomas Kuhn (1996) writes, “Looking at a bubble-chamber photograph, the student sees confused and broken lines, the physicist a record of familiar subnuclear events. Only after a number of such transformations of vision does the student become an inhabitant of the scientist’s world, seeing what the scientist sees and responding as the scientist does” (p. 111). An education is an ongoing widening of this capacity to see what was once not seen at all – in other words, to see a miracle⁷⁶ and become converted to another world. To see and respond as a teacher, in order to teach a child to read, one begins not with reading research, by *information* about reading, but by reading the child. Janusz Korczak writes, “I am reading the same child once, twice, three and ten times, and after all that I still know only very little, for a child is a vast, wide world” (in Efron, 2008, p. 44). To read “rightly,” Virginia Woolf (1926/2001) argues, demands that we not impose ourselves (and all our preoccupations, preconceptions, our preferences, judgements, even our wishes) but follow the writer (or child) in their “uncompromising idiosyncrasy” (p. 46). We must attend to what we do not - cannot – already know. To read thusly, Woolf adds, is “the most arduous and exhausting of occupations” (p. 47). Perhaps that is why Simone Weil notes that “attention is the rarest and

⁷⁶ Perhaps our capacity to see miracles can be enhanced by a wider understanding of the miraculous. A bubble-chamber photograph, in making visible what was once entirely unknown to us, is a miracle. It isn't, however, the technology that is miraculous, but the opening it allows into wider seeing (only possible if we have ideas that allow us to see what the technology makes visible) such that the world becomes, in essence, new to us.

purest form of generosity” (cited in Pétrement, p. 462) and attention to a *sufferer* (which is not at all the same as being “kind” to them or pitying them) “is almost a miracle, it is a miracle” (Weil, 1977, p. 51). Attention is a practice of love, and that love – of literature, of subnuclear events, of a child, of a sufferer – allows us to see more expansively. To learn, in other words. A practice is distinguished by its attention.

What we attend to as teachers is the educative experiences for the student. The more our interest becomes an “an extension of our own preoccupation with ourselves” (Thurman, 1961, p. 12) – what can *I* do? – or in a preoccupation with explanations – and the more exhaustive and comprehensive, the more they preoccupy us – the more our attention is diverted from what *is* of concern. Our focus becomes fixed on fixing, on improving, on getting somewhere, going faster, closing gaps (as though we know the path and the only problem is to move from here to there). Attention is free, in so far as we are able, of our intention: judgement is suspended (Masschelein, 2010).

When my attention shifted from getting Roland to read (through strategies, interventions, testing, methods, programs) to attending to his experiences, when, in doing so, my love for him spilled into the space between the other children and I to make a silence thick enough to hear his suffering, when we knew together that *we* were his suffering, a miracle.

Katie Jameson, inclusion advocate and mother of Kenzie, a non-verbal child with Down Syndrome, shared the response of her son Wally, Kenzie’s twin brother, upon learning a new baby girl was joining their family. At first, he was excited, she writes,

A few hours later Wally started to look worried, and after a big sigh he said a little sadly, “Well, I just wanted a baby that would talk.”

To Wally, a baby girl meant Down syndrome. And to Wally, Down syndrome means no talking....

When I asked him why he would be sad if this sister didn't talk, his response summed up years of learning and growing that I've been trying to do as a parent.

He didn't say he didn't want Down syndrome.

He said, "I just want people to be friends with her."

He doesn't want Kenzie to be different than she is – he wants the world to be different, to include her. He is 7 years old and can vividly see how difference is accepted – or not. He might not be able to name it, but inequity is what he feared when I said, "It's a girl." He didn't care if a new baby sister had a disability, he only cared if life would be good to her.

There is nothing that shows how unforgiving society is than a 7 year old brother wishing the world would open its doors a little wider for his sister.

The miracle of Roland's story is not that he learned to read. That he learned to read is an effect of the miracle, which expanded not just his world, but lit a new world for all the children in the class and for me, too, and for you, I hope, this lit torch that lights a wider world.

I do not know if you noticed. I did not teach Roland to read.

Dancing Heidegger: An Assessment Henry Miller (1968a) tells of his high school art teacher who told him he was so inept that he should not bother to come to class. He, in turn, loathed her: "a dried-up spinster who talked of nothing but planes, shadows, perspective and such nonsense" (Part 1, 12:16). He concludes that if he had been successful in school, he would have never learned to paint; he would have succeeded in technique. To paint, he says, "is to love

again, live again, see again” (1968b, Part 4, 2:27).

A few things about the teacher. She was very likely alone in a class with many students, most of whom cared very little about art and were enrolled to get credit for graduation. She followed a curriculum that, no doubt, specified she teach planes, shadows, and perspective; she was very probably trained in “best practices” for teaching those skills (in other words, the techniques of teaching), and too, required to have her marked assignments align with course outcomes that included them, and, therefore, to develop her lessons toward them. It is even possible that she was teaching art even though it was not her own specialty because there was no one else willing or able to do so. Certainly, this was often the case in high schools I have taught. Her confidence in teaching art, therefore, might have been entirely limited to taught techniques (like my students who inevitably submit to me their poetry units – lessons on alliteration, personification, and onomatopoeia, culminating in a poetry book in which the children write cinquains, diamantes, and acrostics, adorned with poetic techniques – as though poetry is thus achieved). What is more, one can imagine Henry Miller as a teen, when as an adult, in a letter to a friend, he wrote, “I start tomorrow on the Paris book: First person, uncensored, formless – fuck everything!” (quoted in Turner, 2012, p. 3). I am almost certain he was not a compliant student but was one who would “strike back” frequently.

Yet given the conditions of teaching – and therefore learning – there is little choice but to make it calculative, and this is as true today as it was for Henry Miller’s teacher or for Mrs. Swaffield or for the teachers Dewey (2003) described who were “compelled to instruct in batches and on the basis of uniformity” (LW.2.121) and to become, in essence, a “factory hand,” not expected to act with independent thought or creativity, although “their conduct and movement are subject to a closer watch and stricter censorship” (LW.2.122) and the materials

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they work with rebel in the way machinery never does. Thus today, despite our advanced knowledge, as then, teachers learn to develop their lessons into “units,” to organize them into “objectives” or “outcomes,” to reward compliance in meeting them, and the focus of education research is to find the best ways to get teachers to get students to achieve those prescribed outcomes (rapidly, optimally, effectively, efficiently) by translating (in palatable ways) what is known so teachers can then apply it in their practice. In such an industrial organization, however, the child is missed, the teacher is missed, the value of whatever is learned, that is, what makes it *worth* learning, is missed. Missed, too, Dewey argues, is “the demand of the soul for joy, or freshness of experience.... Such refreshments, themselves transient, yet discipline the inmost being ... since they shape the soul to a permanent appreciation of values beyond its former self” (LW.2.112).

Thought experiments, however, cannot simply identify what is wrong (a temptation I continue to succumb to), nor are they pictures of otherwise, of Utopia or even Dystopia to inspire or jolt, but are “possibilities of what is now moving” (Dewey, 1929c, p. 135). In his study of conversion, William James (1902) notes that the will to believe can only be stretched so far: “we cannot create belief out of whole cloth when our perception actively assures us of its opposite” (p. 212). Often teachers return from professional development or university courses fired with enthusiasm but back in the classroom, the walls close in again, and any possibility leaches out in the face of the actuality of expectations, curriculum, assessment, and the batch of children before them.

For the *fundamentals* of education to change, if love rather than knowing better is to become its foundation, we must *feel* how we can go on without familiar measures, given that

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measurement is how we ascertain value at the present time and measurement is only possible if the end is prescribed.

How does love become the centre of what is now moving? Even if, or especially if research is measured only by its value in the classroom, how will that value be measured? How will we decide which research is helping students and teachers? What, after all, is the help love needs? And in schools, how will we sort students into those who are “good enough” to advance and those who are not? Who will be awarded “good” placements in sought after programs at top universities? And in universities, how will we decide who has sufficient knowledge to be accredited for graduation, in the case of teaching, for example, to become a teacher? After all, love, like knowledge, can be used for evil as well as good, can become weaponized or commodified. How can we *be certain* that, in doing otherwise, we are doing *better*?

We cannot.

Yet if we accept that the world holds no guarantees, if we accept that we cannot *control* the world, if we surrender to what is larger than ourselves (we are not, after all, the centre of the universe), then what once seemed insurmountable obstacles will become “like tissue-paper hoops to the circus rider – no impediment; the flood is higher than the dam they make” (James, 1902, p.263).

Then, if teaching is a practice of love, and love cannot be measured, the focus can shift not to a different kind of measure which keeps us in the same frame but to an otherwise entirely, a shifted constellation, not an order imposed from above in an effort of control but as a weaving of support, a network of mutuality for teachers and students so that no one of us decides alone (none of us can know it all) and such that, because what affects any one of us, affects all of us (King, 1963/1977), we act for and with each other.

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When once we can *feel* together the concerns of teaching as a practice of love, solutions will proliferate. Yet, the concern of teaching is not the same as the concern of reading research or cognitive psychology or motivation research. Nor any science or philosophy.

When education is subsumed under the idea of “knowing better” as prescribed by other research, measurement in education becomes imprisoned by epistemology, that is, theories of knowledge about what counts as justified belief or known truths rather than mere opinion or superstition. Once positioned, knowing can be verified and therefore counted. Or dismissed. Within the framework, people, too, are positioned: those who know better and those who can come to know better “one day” if they do as they are told to acquire the better knowing. Yet for many, that day has not yet come. “I was seven years old 47 years ago,” James Baldwin said in 1979, “and nothing has changed since then” (8:45). Perhaps that is as near as we need to come to our own time. Historical voices are distant enough to tell their truth without the clamour of whatever rings in our ears of recriminations and justifications, of evidence and statistics, or as explosions of rage and fear.

Yet within *education*, which is wider than science, it is entirely possible to reimagine knowledge. “Authentic epistemology,” Serres (1995) argues, “is the art of inventing, the springboard for passing from the old to the new – which is education” (p. 14). Teaching, in other words, which is the practice of education, *is* epistemology. Epistemology, in this sense, is not *separate* from teaching, nor is it helpful to separate various ways of knowing into categories so that one can be “positioned” by them or to position what can be counted as knowledge. Epistemology exists at the vital contact between teacher and student in the inventions that make possible the knowledge that passes between them.

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Not only is education wider than science, its interest is to widen what is known, not to categorize it, but to move with it toward fuller, richer, thicker understanding. An education, as Whitehead (1929b) puts it, allows “an appreciation of the infinite variety of vivid values” (p. 199). After all, as he adds, “When you understand all about the sun and all about the atmosphere and all about the rotation of the earth, you may still miss the radiance of the sunset” (p. 199).

As soon as we limit what counts as knowing – and who counts as knowing it – not only do we miss the possibility of more expansive knowing but in applying those limits, turn *away* from the concerns of teaching.

Consider this story, which is not mine, but could have been. I have sat in on similar discussions of similar questions. Denis Phillips and Claudia Ruitenberg (2012), education researchers exploring epistemological diversity, consider a request from a student, a practicing teacher in a Master of Education program, who, when required to prepare for a seminar to introduce a text by Heidegger, asked, “Can I *dance* Heidegger?” The instructor’s answer was no.

Ruitenberg, a proponent of arts-based methodologies, that is, that art, too, is a way of knowing, states that if she were asked, she would say yes, but only if the student was able to give an adequate justification for dancing and included a spoken or written explanation with it. As she argues, it was “not a seminar in dance, nor in dance education or even art education more broadly, and so it seems fair to expect something else besides dance to take place when a student introduces a reading to her or his colleagues in such a context” (p. 145). In other words, the dance is an addition or embellishment to the explanation but cannot stand alone in the same way.

This is to position the dance *within* the metrics of explanation – which as the *end* of whatever work is done can stand alone – so that whatever might have been made possible by the dance is trapped within its boundaries. Only those aspects of dance that can be explained would

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be deemed significant. However, surely only what *cannot* be explained in words is significant. Otherwise, why dance?

If art is a form of knowing, why *not* dance? What is the *danger* of dancing? Will the students “fall behind”? Will it encourage “barbarity, idleness and waste” (Francis, 1992, p. 99)? Will the student, who, in essence, becomes the textbook that Kuhn (1996) describes, such that Heidegger is recapitulated “in a far briefer, more precise, and more systematic form” (p. 165) gain something in explaining that would be lost otherwise? Will something important come of *explaining* Heidegger that would be missed in a dance?

Phillips (2012) argues unequivocally that to dance Heidegger is absurd. He writes, How could a dance convey Heidegger’s philosophical theories and conclusions? He makes many distinctions and devises a variety of concepts, using technical language and lengthy arguments. How can a dance summarize a lengthy and technical argument? And how can a dance offer an assessment or a possible refutation of one or all of these elements? Finally, an interpretation or assessment or summary is itself a knowledge-claim and therefore is open to dispute and possible refutation. Can one look at a dancer’s pirouette and meaningfully remark “I think you have misinterpreted Heidegger’s point here...”? Could a spectator who knows nothing about Heidegger or German philosophy come away from the dance performance saying, “My word, that concept of Dasein is really profound”? (p. 154)

His response describes teaching, not only as getting students to “know better,” and in this case, to enhance their capacity to effectively share that better knowing (in other words, to better teach), but as a way to *judge* that their knowing is, indeed, better.

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What the student knows is irrelevant, even if their knowing is “acknowledged”⁷⁷ (that is, they can dance but must include an explanation), since it is subject to judgement (which is not attention emptied to receive but attention to and for what is preconceived), even if the judgement is not “marked” with percentages or letter grades but only accepted (or not) as “meeting expectations.” As Jacques Rancière (1991) says, students must understand that “[they don’t] understand unless [they are] explained to” (p. 8) – and more, that they cannot *prove* that they do know, until they can explain it back to the teacher. In other words, students learn that they cannot think for themselves.

This has been my greatest realization now that I am teaching at university. Unlike elementary and high school students, where explosions were frequent and what I said had less interest to them, the students at university expect the professor or the texts they provide to have answers and are content to receive them without question and to accept that their task is to explain them back accurately (as defined by the teacher who judges their explanations). Indeed, they are frustrated, even distressed, when there are deviations from this well-rehearsed formula.

“What oppresses,” Gert Biesta (2017) argues, “is the belief that one is unable to learn, think and act for oneself – a rejection of one’s freedom – and emancipation concerns... interrupting and refusing the student’s denial of their own freedom” (p. 64). Yet as Dewey (2003) remarks, while teachers remain unemancipated, “still shackled by too many rules and prescriptions and too much of a desire for uniformity of method and subject matter” (MW.15.187), they cannot interrupt the student’s denial of freedom and, indeed, believe that their task is to *control* the student, so they learn to do what they are *supposed* to do.

⁷⁷ Acknowledgement does not open to make a new space or a better space. It nods to those who have been brought into the existing one and allows their ways to be added but only insofar as the dominant ways remain dominant.

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To be fair, Ruitenberg and Phillips read the story not *as teachers*, this wider lens, but through the lens of their research interest. Yet while their reading is a contribution to philosophy, their conclusions, applied to teaching, are disastrous – and at the present time the contribution of education research from a variety of fields *is* in its applications for teaching. If education is indeed a practice of love, however, it cannot merely *espouse* freedom but *act* for freedom. The problem for the art of teaching, then, is not whether a given way of knowing is *legitimate* or even if a given explanation is *correct*, but rather, “to select the kind of present experiences that live fruitfully and creatively in subsequent experiences” (Dewey, 1938, p. 28) – that is, through the future decisions and actions of students. If they are going to create a just and equitable world, they cannot simply follow orders but must themselves *act* to make a just and equitable world, for example, like Rosa Parks, who *refused* an order to move to the back of the bus and unlike Adolph Eichman, who simply followed orders to arrange for the mass deportation and extermination of Jews (Biesta, 2020). What does it matter if students can *explain* justice if they do not learn to *use* that knowledge to act justly?

Knowledge of epistemology does not allow a teacher to draw conclusions about the art of teaching any more than being able to explain the theory of relativity does – although both are, or can be, a light to the eyes and a lamp for the feet. A teacher as artist is always feeling forward for greatest growth, for possibilities that emerge moment by moment to allow what is beautiful (and what is beautiful is always just) to be discovered in action. In other words, the knowing of teaching – and therefore its verification – unfolds in and through the experience itself.

Phillips (2012) suggests that there might be a place for dance in a discussion of Heidegger:

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One can certainly perform a dance that expresses one's feelings or attitudes toward Heidegger's writings – personally, I would rush on stage, writhe about, then tear out my hair, a performance that would convey its point clearly enough. (p.154)

These feelings and attitudes, however, convey nothing about Heidegger's theories and conclusions, he argues, and are therefore irrelevant. Yet *teaching* cares very much about feelings and attitudes, for it is through them that a student is touched, and indeed, this is only possible if the teacher (as artist) yields, too, to feelings; what is offered cannot be merely "brainspun." After all, what avail it to be able to read Heidegger, even to summarize his writing adequately enough to interpret some of his technical points, if the feeling evoked is to tear out one's hair? Will they read Heidegger again? Is their understanding about themselves, their world, and of teaching (for why else are they gathered as educators) *expanded* through the experience of reading Heidegger? Even Ruitenberg's more generous agreement to allow the dance but only with text drains out possibility. As Tolstoy (1904) points out, "Had it been possible to explain in words what [they] wished to convey, the artist would have expressed [themselves] in words" (p. 119).

A pause to consider the choice of Heidegger for a reading in a Master of Education program. Heidegger is by no means easy to read or even an obvious choice for reading. Often, in an education rather than philosophy program, one reads *about* Heidegger in a textbook. Or the solution to the problem of the difficulty of reading Heidegger is solved by more *relevant* texts, more *current* texts, more *accessible* texts.

But what I have come to learn, decades after Cody threw his copy of *The Crucible* across the room, is that the text itself was not the problem. It was me. I explained it (I made a textbook of the text). Then I asked them to explain it back to me. Then I marked the explanations. There

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was no room for students to *feel* the anguish of John Proctor, to be touched by the moment when he had only to sign his name on a paper to prove the purity of his soul to prevent his hanging, the moment when he refuses, crying out in answer to why not:

Because it is my name! Because I cannot have another in my life! Because I lie and sign myself to lies! Because I am not worth the dust on the feet of them that hang! How may I live without my name? I have given you my soul; leave me my name! (Miller, 1953, p. 143)

All those years of solving the problem of *The Crucible* by purchasing *relevant* texts with *current* contexts or seeking just-right books with just-right vocabulary, of infusing Indigenous content, of finding better ways to scaffold the materials so each student could *access* them, of seeking technology as a learning ally, of teaching resilience or grit or growth mindset so students can “stick” with difficult texts. All this to *get* the child to the predetermined end: to read “at level.” Changing the text does not change the model: the text represents knowledge that must be consumed so that the student knows better. All my work was aimed at making reading *palatable*.

It is only now that I can hear what Cody told me. By signing his name to the essays I assigned, he was *betraying* his name.

The betrayal, however, is not that the text did not *represent* his experience, as though this were possible or even the purpose of an education which is always to *widen* experience. The betrayal, and it does not matter what text he is given, is that he was not offered the opportunity to make something *with* it, to become *from* it. The text was used to make him into what he was not.

James Baldwin (2011) writes about why he stopped hating Shakespeare, who represented for him all the repressiveness of the English language, which he believed did not speak to him or of his experiences as a Black American. He began to understand, however, that the language that

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Shakespeare used is not meant to be imitated, but must be found, he says, in the lives of people, and that, he, too, *could find the language that speaks experience*. Shakespeare, “the greatest poet in the English language” (p. 68), Baldwin says, “could have done this only through love – by knowing, which is not the same thing as understanding, that whatever was happening to anyone was happening to him” (p. 68). Baldwin goes on to say that the poet is responsible to the people who produce him:

That is why he is called a poet. And his responsibility, which is also his joy and his strength and his life, is to defeat all labels and complicate all battles by insisting on the human riddle, to bear witness, as long as breath is in him, to that mighty, unnameable, transfiguring force which lives in the soul of man. (p. 69)

It is with this sense of responsibility in mind, surely, that Wordsworth (1807) says, “I wish to be considered as a teacher, or as nothing” (p. 331).

In a focus on strategies to support reading, the *reason* for reading is lost. Certainly, students need books they can read, books they love to read, books that feel comfortable to read, and books with a range of representations, but only insofar as they act to open to further, wider, more expansive reading and therefore, what Ralph Waldo Emerson (2000) calls a “larger imbibing of the common heart” (p. 246). To this end, students ought to read books, too, that are widely influential, not just at the present time, but what has *endured* over time – as Heidegger has done, despite his infamy. As Elaine Scarry notes,

Perhaps Shakespeare and other widely revered artworks give us practice at entering into collective agreements – not in the end a signed covenant to love *A Midsummer Night's Dream* but to dismantle the world's nuclear architecture and the practices that are causing

the earth to warm. Without such universal accords, we almost certainly will not survive.
(Hauskeller, 2022, p. 265)

What is of most concern to *teaching*, if teaching is a practice of love, to return to the student who requested to dance, is that when denied, he may lose the desire to think with and from what he learned of Heidegger or to follow up in deeper readings of Heidegger that might allow him thereafter to grow, for example, a more nuanced understanding of Dasein. The possibilities that emerged in that living moment at the request to dance Heidegger dried up. Instead, the mechanical application of imposed aims was no doubt completed toward successful completion of a master's degree – and all the breathless beauty of Heidegger that Phillips, certainly, seems not to understand in the least, lost, all the freshness that the very idea of dance evoked, evaporated.⁷⁸

The question always arises, as though this is the matter of greatest significance: by what calculation can I argue (whether I am teaching at a university or a high school or in kindergarten) that students know what they are *supposed* to know.

If they are supposed to know that they cannot think unless they are told what to think, then the usual answer suffices.

If what the student is supposed to know is not what Heidegger *says* (even supposing that a teacher knows this for certain) but how *the students* themselves can use the knowledge that Heidegger offers to go on learning what is desirable to learn and to act wisely, then, as a teacher, *I cannot know*.

⁷⁸ Dewey (1916) writes, "In education, the currency of these externally imposed aims is responsible for the emphasis put upon the notion of preparation for a remote future and for rendering the work of both teacher and pupil mechanical and slavish" (p. 129).

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If this alternative is the case, it is necessary to escape calculation entirely, which Heidegger (1966) argues, can only “claim, enchain, drag along, press and impose” (p. 51). Instead, he says, one must “dwell on what lies close and meditate on what is closest; upon that which concerns us, each one of us, here and now” (p. 47).

In such dwelling, it is possible to know what is beautiful, which is, I have said, a living measure. It cannot be found outside of the experience itself.

Imagine saying yes to the student, this different – miraculous – end to the story. Imagine sitting at the back of the room, and he comes out dressed in black and proceeds to dance Heidegger. It begins awkwardly, a trip, a slip, it does not make any sense to you and then, suddenly, nothing else does, because you think, just maybe, your soul slipped out of your body and danced, too. At the end, when the dancer stops, eyes shining with the tears that are in your eyes, too, there is a moment of deep-felt silence in the room. And then the applause. And then the clamour of conversation, ideas, questions, connections.

That is just one of a thousand experiences of beautiful teaching I have witnessed.

These experiences are miraculous, an opening into other perceptions that, just a moment before, were invisible to us.

Yet what if the dance fails to touch the audience? Surely, this, too, can make a *difference* for students and carries with it the seed of beauty in the possibility of growth. After all, what is there to learn from yet another summarization of Heidegger, one found readily at a click?

Still, a teacher trained to measure immediately wonders: but how will I *evaluate* beauty? What *mark* will I give the dancer?

What *difference*, I wonder, will a mark make to the experience? I have spent decades trying to help colleagues understand the miseducative impact of their marking, and now teacher

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candidates. But what I have come to realize as I watch “unmarking” swept inside the way it is, our focus taken up by rubrics, learning outcomes, performance standards, proficiency scales, variations of emoticons as though, somehow, these updates can erase (or at least disguise) the imposition, is that without a change of idea, unmarking inside unchanged schools, while taking additional time, energy, and resources away from what matters, because it is enclosed within the existing grammar of schooling, nothing changes.

All our focus continues to turn away from the experience, away from growth, away from love.

I have read and reread Heidegger and interpretations of Heidegger. I do not know Heidegger and cannot explain his work although at times he pierces my heart. That piercing keeps me reading, listening, wondering, considering, reaching. I yearn to see Heidegger danced. I am almost sure that, if once I could feel Heidegger in my body, in my heart, in the movement of my hands, I could understand Heidegger at last. And that understanding, I think, I feel, would move through me in my art even if I could never explain Heidegger in words. Heidegger would be a light to my eyes, a lamp at my feet. If education is to become a path to freedom and equity and from there, toward a longing for truth and justice, a summoning of other futures, then it cannot be arrested by measures outside of the experiences of teaching which is the vital source of its movement.

Yet a great concern wells up that in so doing “anything goes,” that nothing will be learned at all as individual teachers improvise and learners take up whatever they like best with no consideration to what is *necessary* for them to know. Ironically, this is not prevented by imposition despite efforts to prevent “ineffective practices” through more supervision, in other words, further imposition, extracting and measuring outcomes and setting up surveillance via

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external monitoring to ensure that teachers and their students do as they are supposed to do: teachers nod along, follow rules, go into their own rooms, close the door, and do as they are done to. So the teachers, so the students.

Or teaching can be practiced within a dense web of support that provides the checks and balances of our common concern. This is the work of a teachers' science.

Indeed, it is only through shared undertakings and experiences whereby "each has to refer his own action to that of others, and to consider the action of others to give point and direction to his own" (Dewey, 2003, MW.9.94) that growth can occur, at least growth as grownupness – to desire what is desirable for oneself and others. Practicing as an artist with a *living* measure of beauty is not easier but more difficult, since it is necessary not to create an experience that is only enjoyable (this is entertainment rather than art and practiced for the profit of those who produce it – in the case of education, to "motivate" students to do what they are supposed to do) but one that arouses in the learner a desire for further experiences of what is *desirable*. A teacher liberated from measurement is not without obligation; their responsibility is "to defeat all labels and complicate all battles" (Baldwin, 2011, p. 69) to *bear witness* to transformations toward justice and equity.

The (miraculous) dance of Heidegger, thus, may have been clumsy and filled with technical errors, both of interpretation and execution; yet an experience is not educative because it is perfect. It is also not educative simply because it is what a student *wants* to do or *likes* doing or is already good at doing, but for its *movement* and the movement it generates. This is what the teacher is responsible for – and responsive to.

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The value of the experience is determined by its consequences, and in teaching those consequences are often long in coming. The problem is not solved, however, by calculation but by ensuring a wider range of support and denser networks of possibilities.

What is (or might have been) most beautiful about the dance is the space it can open for further experience. The students, in thinking together in seminar about Heidegger, must stretch to understand his work in the light of something completely new, something that is not written anywhere, and cannot be found in the thousands of articles available at a click and cobbled together from scrolling and scanning for keywords, then extracting and reformulating into the required format. Or more rapidly now, through generative artificial intelligence, a rapid recapitulation of what is already known to explain Dasein, for example:

Heidegger's Dasein is a philosophical concept that refers to the human experience of being in the world. It is a German word that can be translated as "existence" or "being there." Heidegger believed that humans are fundamentally different from other animals because we are self-aware and can reflect on our own existence. This makes us unique in the universe and gives us a special responsibility to care for the world around us.

([OpenAI](#), GPT-3 Playground, May 2022)

Such an explanation, however, is thought-less, as Heidegger (1966) says, since no thinking is required of the student: "Thoughtlessness is an uncanny visitor who comes and goes everywhere in today's world. For nowadays we take in everything in the quickest and cheapest way, only to forget it just as quickly, instantly" (p. 45).

A teacher as artist, then, might offer this summary to students so that in wrestling with what is new, both the capacity of artificial intelligence to reproduce and the human creative capacity as represented by the dance, they might come to understand something about what

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Heidegger called “real education” which does not produce knowledge workers – human resources – nor is the work of education to develop, measure and report on the skills, knowledge and attitudes of the student as potential resources; on the contrary, he says, “real education lays hold of the soul itself and transforms it in its entirety” (Heidegger, 1998, p. 167). Teaching, he says (1968), “is more difficult than learning because what teaching calls for is this: to let learn” (p. 15). In the relationship between teacher and student, he adds, “there is never a place...for the authority of the know-it-all or the authoritative sway of the official” (p. 15): a teacher is not more certain than the student but less so.

There is no possibility without risk. Knowing this is what makes us less certain. We can only hold this *faith*: that love leads us toward equity and justice and away from injury.

Daniel Blackstone (2024) of the Checlesht First Nation, translates the Nuu-chah-nulth word *haa-huu-paa* that is used, he says, to describe the process of teaching and the feeling it evokes: “Teaching should lift somebody, you should feel stronger, you should feel braver, you should feel more committed to who you are” (6:06).

Surely that is a description of a miracle, and the effect of a miracle, as William James (1902) puts it, is that “paltry conventionalities and mean incentives once tyrannical hold no sway” (p. 267). We are transformed.

Once we *feel* teaching as a practice of love, we keep whatever we already know and whatever method we are using – all the rich and diverse offerings organized by our science – loose in our hands to allow for the play and resistances of materials, of experience, of energy, of miracles that move us in the direction of dreams.

Teaching like the Sun Who (and what) are we disqualifying or dismissing with requirements and expectations, with the hurry to get to prescribed destinations and an insistence

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on proof that they have done so as required, that they are sorted, upon arrival into grades as though they are now stamped and ready for market, as though the aim of education is to prove that what is “bought” (whatever status conferred) is worth the price and has, as promised, improved the one who was once inadequate? And “weeded out” those who are not? Surely what is lost in our calculations, these tyrannical impositions, what is *injured*, is everything sweet, all that we long for, when we dream for our children.

All that we know is not the *end* of education but a beginning that we offer them.

In the dark days during the Nazi occupation of Poland, in describing life at the orphanage when it was moved to the ghetto, Janusz Korczak (1978) says, “Into the vision of desolation, destruction, and ruin, hopelessness and even lack of expectation, children’s laughter, boisterous, joyful, bursts in. A laughter that summons the future, beckons the spring, and heralds tomorrow” (cited in Efron, 2008, p. 51). What it beckons is something beautiful that is not summoned by hurrying or higher expectations or improved strategies or careful calculations. It cannot be bought or sold. It cannot be imposed.

Some years ago, when I was still teaching in an elementary school, our new principal introduced a directive for staff: we were all to use restorative practices, developed from the science of relationships and community. (School districts routinely take up the latest research and impose it on staff through such directives, setting up a flurry of workshops, bringing in experts, purchasing new resources. The leftover materials from previous initiatives are bundled up into the back of already crowded cupboards of abandoned things.) He passed out a set of phrases as an introduction: in pairs our task was to sort them under either “traditional discipline” or “restorative practices.” We sorted the phrases such as exclusionary, inclusive, punitive, restorative, create a sense of belonging, fosters isolation. When I suggested at the end of the

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exercise that it was an unhelpful dichotomy, the rest of the teachers glared. They did not want any discussion to extend the meeting. They just wanted to go through the motions – and go home. I took my cue and nodded at the principal's response.

His words came back to me, though, the next day. I had only just got the class settled and ready for a math lesson when the door banged open. Jesse swaggered in, called out greetings to his friends, deliberately shoved the desk of a student he routinely bullied and knocked over Annie's pencil box.

She leapt up yelling; the class exploded.

"Jesse," I said, as soon as I had restored some order, "do you need to be someplace else this morning?"

"You say that every day."

"Well," I said. "There you go."

I felt a wash of shame for my punitive, exclusionary practices and yet, despite my knowledge of restorative practices (I had already researched them extensively before the new principal, forgetting to ask us what we already knew, introduced them to our staff). Affective statements like, "It makes me sad when you knock over things deliberately" – felt cold in my mouth. Or restorative questions like, "What do you think needs to be done to set things right?"

Nothing could be set right so.

I paused for long enough and looked at Jesse so intently that quiet descended on the class and Jesse's swagger shifted to a shuffle. My frustration dissolved against the sharp edges of his pain that I could see as if it had become another being and sat inside the room.

And quite suddenly, I saw, too, how beautiful he was. I was reminded in a flash of what Thomas Merton (1968) saw, upon leaving the monastery to visit the city for an appointment:

At the corner of 4th & Walnut...I was suddenly overwhelmed with the realization that I loved all those people, that they were mine and I theirs, that we could not be alien to one another even though we were total strangers. It was like waking from a dream of separateness, of spurious self-isolation in a special world.... This sense of liberation from an illusory difference was such a relief and such a joy to me that I almost laughed out loud... If only everybody could realize this! But it cannot be explained. There is no way of telling people that they are all walking around shining like the sun. (p. 153)

I laughed out loud and said to Jesse, "Let's start again."

He smiled slowly back at me, shining like the sun.

Directions for Future Research

I feel like I am clutching your hem and telling miracle after miracle (I have so many more), *explaining* them, although I promised not to, begging you to *believe*, to have faith in love. This, however, is the crux of conversion. We cannot *make it happen*. The best we can do is offer a way of happening. This is the lesson of teaching, too, that took me so long to learn, that I am still learning. The revelation of the miracle, whatever miracles are seen (and they abound in our daily lives) cannot be imposed: I cannot *tell* you the revelation. Revelations are wordless. They are light.

But if once education research turned its focus toward the vital contact between teachers and students, not to verify *for* education but to organize for verifications which can only be made in the making of experiences – which as living are tentative, for now, so far, provisional, a starting place for further experimentation and inventions – and then ongoingly reorganized, revised, widened, extended, revitalized based on those verifications – can you imagine how quickly, how beautifully, how variously our practice would grow?

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I have told stories of miracles in teaching (or teaching as miracle) because teaching is, surely, the *interest* of education research. One might quibble and say it is learning but within education, or rather within public education (not training specifically designed for commercial purposes⁷⁹), our concern is with teaching, which is for learning *directed toward better futures* for all children. The work of education, which is wider than science, moves forward in ongoing expansiveness. Thus science, too, must ongoingly grow, develop, change, not just make changes, so that what was once its limitation no longer limits. As Whitehead (1933) notes:

Each method of limited understanding is at length exhausted. In its prime each system is a triumphant success: in its decay it is an obstructive nuisance. The transitions to new fruitfulness of understanding are achieved by recurrence to the utmost depths of intuition for the refreshment of imagination. In the end – though there is no end – what is being achieved is width of view issuing in greater opportunities. (p. 159).

I have already sketched, through my (invented, speculative, imagined) model (which is a beginning not an end), what research as a teacher's science might look like, but a model is as yet inert. Without each of us *acting* with it, making the making of it, the model merely adds to the clutter in education's overflowing cupboards.

Conversion, perhaps, is insufficient, too.

Even believing (as I believe) that just futures depend on a shift to the idea of love underpinning our work in education and, even (as I do), accepting the responsibilities that flow from it, it is easy to feel stymied about how to go on. Although a new model is necessary to

⁷⁹ This is the case, too, for universities, surely. Training for a job is commercial. If it is a specialism by which one works toward better futures, it is educational and teaching, rather than training (which can be bundled into textbooks), is necessary for it. In professional education, both aspects are necessary, of course, but as Whitehead (1929a) notes, in contemplating the addition of a business program at Harvard, "It is a libel upon human nature to conceive that zest for life is the product of pedestrian purposes directed toward the narrow routine of material comforts" (p. 94). *Education* cannot be reduced to job training. A university, he says "is imaginative or it is nothing – at least nothing useful" (p. 96).

imagine otherwise, to *act* otherwise, its very wholeness makes it feel impossible to make run in a world that already runs efficiently otherwise. Yet without our actions, the model remains inert.

To begin to make it *actual*, one must also imagine small and more precise starting places for action within the vastness of new beginnings that a new model imagines. Otherwise, it risks remaining a picture in a dream. I want to conclude, therefore, with four potentially fruitful directions for future research that can be taken up even now, even when it still feels like everything is already unstoppably underway. (If you are now converted or have already been converted and patiently waiting for us to join you here in this open space where we might begin to begin again, you will think of other starting places for action, too, different ones that align with your own specialisms.) More specifically, I also want to consider the implications for distance education which this dissertation is *supposed to* address.

I am not arguing that these directions are *different* from current research. Many others are already making here, in this space of otherwise and the more connections that can be made to what already exists, the better. With a new model, and this is the *purpose* of my research, the difference each of us makes can connect with others for more expansive possibilities, rather than become folded into what-is to become an imposition, such that, no matter how well-intentioned, our acts act against the justice we dream of. The difference of concern, therefore, is one of *consequence* not comparison, a difference William James (1907/1981) considers: “In what respects would the world be different if this alternative or that were true? If I can find nothing that would become different, then the alternative has no sense” (p. 27). The “qualitatively different consequences” (Dewey, 1929b, p. 60) of education, both its science and its art, is toward better living for our children now, and through them, into futures we dream of for them, futures that are more just, more equitable, more beautiful.

Bettering

A key starting place for making the model actual is to articulate and enact the significant shift in disposition – and therefore in the role of science – from improving (enhancing, optimizing, scaling up to expand) to bettering, which is not *fixing* to a predetermined “best,” but *experimenting* toward what is (so far) better, which is expansive. Although a teachers’ science would not (cannot) *prescribe* what is better, it moves with teaching and a dense web of knowledges toward better (more just, more equitable, more beautiful) futures. Because what our science makes better (the problems it solves) is given to it by practice, even if the problem it puzzles over (reading, for example) is narrow, its contribution is verified within wider considerations. Bettering, however, is not to guard against errors, but against, in so far as it is able, *injury* – that is, what is *unjust*. Attention to bettering looks up and looks widely to attend to the inequity, violence and suffering that still abounds in education and through education that forecloses bettering. While one of us suffers, we all suffer. The task of bettering, therefore, is ongoing and experimental rather than focused on correcting or eliminating errors which loses sight of possibility, potential, miracles, and the capacity to listen for important failures. As poet Jack Gilbert (2005) writes, “Everyone forgets that Icarus also flew” (line 1). In focusing on the failure, the miracle is lost; to turn toward fixing that failure, the purpose of that flight, however brief – *freedom* – is forgotten.

The focus of a teachers’ science, therefore, cannot be to pass down to teachers its better knowing to improve what is but to *open* toward bettering as a means to *escape* the traps of habit that keep us within the limits of the already known, to look up and out from a preoccupation with our own immediate circumstances (Dewey, 1929a). The attention on bettering demands our science, too, remains open to its own bettering, that its focus is not fixed on fixing others but that

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it sees its own self-renewal as essential to the process. If, as Dewey (1929c) argues, every great advance of science issues from “a new audacity of imagination” (p. 310) that begins with “speculative hypotheses” (p. 310), then our science, to *move* in tune with an ever-changing world and toward what is better, must make space for the imaginative that is the source of its renewal.

The guard provided by our science, a guardrail, rather, does not provide us with calculations to prove the “right” way nor graph incremental improvements. Bettering cannot be calculated. A focus on proof, however helpful for developing *resources* for a teacher’s science, keeps heads down to show how one’s own theory, idea, program or policy is better *than* others. Indeed, our science, looking up and out *with* practice, having leapt, so to speak, from its high banks above its living flow, is freed from its own habits and pretensions, and, at the same time, becomes entangled with – and therefore tied to – the purposes and direction of education. It becomes, not an authority, but a brace, a banister, a source of refreshment for the living practice of teaching.

Or a forager, looking ahead in the changing (churning) landscape to see new lines of inquiry and sources of sweetness that might serve for teaching.

Or a beachcomber, as Yiannis Gabriel (2015) suggests, “not after facts but, rather, after possibilities ...that are latent in the environment” (p. 335).

Or seeking “shards of beauty” (Crozier, personal communication, November 8, 2018) that might awaken us to wider knowing.

Bettering returns science to the exhilaration at the edge of its own knowing (Firestein, 2012): it is science in love for love.

Translations

Because teaching as a practice of love concerns itself with the unseen (with what is ineffable or even sacred) and with better futures of our children (dreams, speculations, inventions, the imagined), its work is always, to a large degree, not yet sayable. Its science, then, must attempt to translate *experiences of practice* so that what comes to be known can be passed on for future making. This is very different from translating research to pass down to practice. As William James (1902) reminds us, drawing on the work of Harold Fielding, “Speech never proceeded from grammar, but the reverse” (p. 436). At present, far too often, science offers a grammar for schooling, and teachers and students are made speechless within it. If our science turns to listen first, a new grammar might follow not to explain but as a bettered means of exchange between teaching’s art and science – and also with the wide variety of other sciences and other ways of knowing that are concerned with its concerns. Again, this is very different from an attempt to translate knowledge, however it is gathered, organized and verified, to apply in practice which is not a conversation but an imposition. It is one way. It is designed to explain the superior (approved, authorized) view. Exposition in all its forms is so pervasive it almost seems as though no other way is possible, at least in research. How else is what is superior authorized? We are used to – and indeed heed, still – this language of the “father tongue” which delivers information efficiently, smoothly, quickly, convincingly, as a command. It is a technological and technical form, however, that Heidegger (1998) argues is language “reduced to, i.e., atrophied into, the mere transmission, the reporting, of signals” (p. 141).

Indeed, in seeking translations, our science must look up and out to find words, not in the technical language it has become accustomed to, nor in the language of a business mindset of efficiency, effectiveness, profit and reward but in the mother tongue, in poetry, in ancient

languages,⁸⁰ almost lost, in dance and song, and, too, in the languages of plants, starfish, eagles, mountains. It must necessarily invent ways of saying what is not yet sayable, too, perhaps as writer John Koenig (2021) does, making new words that match feelings that remain wordless. Koenig, for example, invents *mahpiohanzia*, based on a Lakota word meaning shadow cast by a cloud, “the frustration of being unable to fly, unable to stretch out your arms and vault into the air, having finally shrugged off the burden of your weight, which you’ve been carrying your entire life without a second thought” (p. 11).

Or words must be reclaimed to return them to their depth and resonance as David Whyte (2019) does, for example, reminding us that “longing is nothing without its dangerous edge which cuts and wounds us while setting us free, and beckons us exactly because of the human need to invite the right kind of peril” (p. 104). The desirable difficulty.

Translation allows for bettered communication *to think with each other* not only between our science and art and the wider community with a concern for education but between the teacher and student, its vital source. Indeed, when once it is accepted that our knowing, however much we know, is always incomplete, any bettering is only possible through multiple perspectives (no one of us knows what is best): translation for ongoing conversation – language that goes two ways – becomes paramount. Thus, it is not necessary only to *explain* what I know or to persuade others that what I now know is *best* but to engage with others to multiply perspectives toward a denser network of possibilities.

⁸⁰ Ted Cadwallader of the Kwakwaka'wakw First Nation points out that Hul'q'umi'num, the language spoken in the Coast Salish territory, is action- and relationship-based, while English is noun-based and therefore focused on things. For example, he points out, “the word for huckleberry is sqw'uqwtsus. That doesn't actually translate to huckleberry, he says, but rather “the motion your fingers do when they work together to pick the huckleberries.” (in Marlow, 2021). Other languages attend in other ways. Love is only ever enacted: it is a process not a thing; a practice of love needs a language to reflect its ways. The father tongue will not do.

Such translations begin with listening. “Listening,” Ursula Le Guin (2004) says, “is not a reaction, it is a connection. Listening to a conversation or a story, we don’t so much respond as join in – become part of the action” (p. 164).

Should such an effort begin, not as a means to impose but to open, not to control but to include, not to orchestrate but to participate, I imagine the very forest would quiet in honour of the sacred work and ravens tiptoe on rooftops, listening in to our listening – and if we listen long enough, join us once again at the table.

Mapping

I have pondered if our science must be unmapped, since maps too often take attention away from the (unmappable) experiences at the vital contact of education. But I realize that what is needed is not to tear up maps but to layer them. When I was a girl, we had a set of encyclopaedias, and my favourite pages were the transparent overlays that showed the human body. With them, it was possible to see under my very skin and to its various hidden terrains.

Thus, the maps of a teacher’s science, in its concern for education which is wider than science, mapped with the many who sit at its table, would have overlays not only from various sciences, maps verified by their own verification, and from the experiences of teaching as well as other knowledges, also so verified, to begin to see, as each overlays the other, the knots of entanglement that connect, the islands of possibility in the ocean of diversity, maps for bettering that are always open to new layers. Within each layer, everything, including you and I, is located differently so that the constellations of knowing and being become visible, that is, unfixed from positions to move in moving worlds, and although the maps are each fixed, nothing is fixed into position by a dominant (“correct”) map of the way it is. The very visceral, visible, and tactile movement of layers would remind us of the invisible world between the maps as well as beyond

their edges, these places where next learning always lies. At the same time, each map stands on its own, its own puzzle from which a more expansive knowing becomes and from which entanglements can become visible. What is more, at times, it is important to remove layers, so that the heart is seen or the bones of things, or the deeply sacred and local so it is not lost or buried, even as a keen sense of the greater whole from which they are inextricable, remains.

This multilayered mapping, transparently partial, becomes a starting place and ongoing source from which our science might draw for the patterns and devices that it inventories for teaching and from which new vistas for next exploration might become apparent or alternative paths forward in the rich varieties of experiences of teachers and students. Indeed, perhaps, it is an unfixing of maps, themselves, mapping as a creative process, as Tim Fawns et al. (2023) argue, “and not designed to find specific locations, but to continue to find new things” (p. 628). Those finding, however, are not *educational* until they are brought home to the children.

Intimacy

Recently, in a BC school at a sporting event, a father shouted abuse at a nine-year-old girl, declaring that she was “trans,” and, therefore, a boy competing in a girls’ event. In an interview, an LGBTQ+ advocate shared that what is necessary to avoid situations like this is better understanding through more information (Macarenko, 2023). This is a traditional solution. People need to become “educated,” in other words, to *know better*. But more information is an argument that invites evidence for and against and, indeed, this incident provoked protests against “gender ideology” in schools. A more intimate solution is necessary that is a response to *suffering* which is never just and cannot be justified, that demands not thinking abstractly about the situation or finding generalized solutions, but to respond to the immediate with care and

solicitude “for what the present situation may *become*...and cherishing attention to that in whose potentialities we are interested” (Dewey, 1929c, p. 225).

Love, in fact, is needed, not only for the little girl who was injured but for the father whose hatred is a gap, a gaping wound, a foot on the neck, a cattle prod at the breast. Hate cannot be defeated by information but by attention which is love.⁸¹ Love cannot be searched for on the Internet or organized into a course any more than suffering can be fixed by knowing better. We can only *feel* Martin Luther King Jr. (1963) words: “Returning hate for hate multiplies hate, adding deeper darkness to a night already devoid of stars. Darkness cannot drive out darkness; only light can do that. Hate cannot drive out hate; only love can do that” (p. 53).

To serve *within* a practice of love, then, our science cannot drop its information from above as though information is solution but must move into a more intimate relationship with experience itself. William James (1902) points out that “it is absurd for science to say that the egotistic elements of experience should be suppressed. The axis of reality runs solely through the egotistic places – they are strung upon it like so many beads” (pp. 499 - 500). Indeed, he suggests that “the rigorously impersonal view of science might one day appear as having been a temporarily useful eccentricity rather than the definitively triumphant position which the ... scientist at present so confidently announces it to be” (p. 501).

Perhaps that one day is now.

What is needed is to look up and out from our own preoccupations but not away from the intimate turning places where our actions can make a difference. In its effort to break from prior

⁸¹ Ruha Benjamin (2024) writes, “Relying on laws to change society or assuming facts alone will convince people of their wrongness seems to me a foolhardy proposition.... We must populate our imaginations with images and stories of our shared humanity, of our interconnectedness, of our solidarity as people - a poetics of welcome, not walls” (p. 102).

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traditions, modern science, as Dewey (1929a) notes, took up the notion that “it is only error that the mind needs to cut loose from, and that it can do this by direct appeal to nature, by applying pure observation and reflection to pure objects” (p. 220), this (fictional) idea at its heart. After all (and it is worth repeating), he adds, “We bring to the simplest observation a complex apparatus of habits, of accepted meanings and techniques. Otherwise observation is the blankest of stares, and the natural object is a tale told by an idiot, full only of sound and fury” (p. 220). In other words, because it is *without concern*, it signifies nothing.

Such an effort moves away from the concerns of education.

As a starting place, therefore, it is necessary to begin to understand the role of a teachers' science as an intimate partner in the loving marriage with teachings' art, this “knot made of two intertwined freedoms” (Paz, 1995, p. 152) and their common concern in a practice of love. Such love is not love of the other for their abstract qualities (Derrida, 2007) or for their “exterior ‘package’” (Merton, 1985, p. 35) but for their absolute singularity. Eichmann, for whom Hannah Arendt (1963) coined the phrase, the “banality of evil,” was, Holocaust survivor Elie Wiesel notes, nice with his children. Yet he followed and gave inhuman orders. Wiesel argues that the problem was with his education: “what he studied and what he taught was abstract” (quoted in Heuck, 2016, p. 13). What is abstract, what can be abstracted, summarized, synthesized, packaged, polished, presented, a pepper-corn or nugget of new truth (James, 1899; Woolf, 1928), and verified by external measures is disconnected from living, everything unique and extraordinary erased or suppressed to fit, and, therefore, disconnected, too, from loving.⁸² While an effective tool for domestication (Yunkaporta, 2020), for the shaping and moulding of students

⁸² MIT research Sherry Turkle (2024) describes a new and rapidly evolving danger to intimacy (which is always reciprocal), the new capacity, through generative AI, to “sidestep vulnerability” (p. 5) through artificial (one-way, difficulty-free) intimacy with machines.

“by those who arrogate to themselves the possession of the understanding and other means of creating the future” (Dewey, LW.17.477), abstract education will not do for inclusive dreams for our children who will, *themselves*, “take an active part in the formation of their own minds or characters” (Dewey, LW.17.476) and become creators of more just futures.

To begin to understand an *intimate* science, one in relationship with its art and many other ways of knowing, is a necessary – and surely a rich, beautiful and adventurous – step toward other futures.

Postdigital Musing

Because of technology, Heidegger (2012) notes, “all distances in time and space are shrinking” and “yet the hasty setting aside of all distances brings no nearness; for nearness does not consist in a small amount of distance” (p. 3). “Nearness,” Heidegger (2012) says, “is not shortness of distance, farness is not the length of distance. The remote is not at all the cancellation of nearness” (p. 23).

What is near is *felt* at whatever distance: it is intimate. I can stand beside you, brush your hand, and feel, nonetheless, that I am invisible to you. Yet I have experienced a revelation so profound that it reverberates in me still, decades later, from reading a poem written by a poet who lived centuries ago.

Although the digital – which can set aside all distances – is a layer that might be extracted for examination (indeed, in multiple layers, as digital research in education evolves, developing fields and branches), the *experiences* of classrooms, at least in the globalized mainstream, occur within an environment that is postdigital. Recently, as I busied myself with something or other, reading an article, perhaps, or washing dishes, I half listened to two small boys I was visiting who were at play with a number of plastic animals in the room with me. I

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heard an argument break out and wondered if I would need to intervene when the littlest, a boy just turned six, said, “Hey Siri, who is stronger, a rhinoceros or a hippopotamus?” Siri answered, the technological voice entering the conversation seamlessly as though she had hovered like a silent servant on the periphery of the room (I, certainly, had no idea she was even there), citing sources and settling the argument.

Just like Virginia Woolf, James Baldwin, and Roland from within classroom or wars, famine, and a climate crisis outside them, new technologies alter. However much we brick up the walls with carefully constructed theories, programs, policies to close out chaos from without and to control what is inside so that it acts, behaves, and progresses as prescribed, the walls are breached, and it becomes more and more difficult to continue with business as usual. Indeed, “without anyone’s ‘permission’ [the postdigital world] entered the classrooms in both student’s and teacher’s pockets (via their mobile devices), immersed into the pedagogical process, and broke the boundaries of formal and informal teaching and learning” (Jandrić, et al., 2018, para. 14).⁸³ Of course, the virtual and the actual have never been separate, but thinking them apart, like the mind/body disconnect, like rigid separations of art and science, theory and practice, you and me, creates less fruitful ways of going on.

Indeed, the attempt to distinguish educational experience as virtual or in-person and therefore which is better or how to make one or the other better, has drawn attention away from education, which, as Dewey (1938) argues should be thought of *as a thing itself*. In other words, education is not defined by – or even understood by – its technology. Indeed, when the argument about technology – one’s *position* – becomes the focus, the effort is away from the thing itself

⁸³ In BC, there is an attempt to mend the breach with a cell phone ban in classrooms setting in play furious debates for and against (along with extensive research as proof for each side), calls for more or less aggressive policy changes, and ongoing discussions about the necessary surveillance to ensure compliance.

and toward convincing or even overthrowing the other, that which one is against. Yet a declaration *against* technology is to be controlled by it every bit as much as arguing *for* it, Heidegger (2012) points out. Indeed, positionality itself, he (1977) says, is the essence⁸⁴ of technology, such that science, as well as education as authorized by it, is *put to use* by technology, becomes ordered by technology and indeed, the more entrenched one is in position, the more urgent it feels to argue against and exercise control over the counter-position, the more both science and education are under its control. Dewey (1938), too, like Heidegger, like Virginia Woolf (1928) and Michel Serres (1995), argues that it is unhelpful to think in terms of positions – what he calls ‘isms – since “any movement that thinks and acts in terms of ‘ism becomes so involved in reaction against other ‘isms that it is unwittingly controlled by them” (p. 6).

Thus, research itself becomes trapped in positions, ordered by its own ordering.

Technologies, too, are so trapped. Or become a trap.

Indeed, as Heidegger (1977) says, and current anxiety about generative AI proves his point, “The will to mastery becomes all the more urgent the more technology threatens to slip from human control” (p. 5).

Yet if education is no longer within a model of knowing better, positioned *under* – and trapped within – the authority of modern science which is, too, trapped, if education is wider than science, then all its theories or programs or approaches or structures and even technology is fitted within its practice of love, the essence of which is not order but freedom.

⁸⁴ Heidegger (1977), as Phillips (2012) reminds us, uses very technical language and fine distinctions, not the least for his use of the word *essence*. Although I do not pretend to understand Heidegger, but in thinking *with* Heidegger rather than about what his arguments, it may be enough to say that *essence* is that which endures. Essence, though, like love and beauty is a felt concept that escapes technological definitions, even when considering the essence of technology itself.

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Yet even so freed, research *in itself*, is not educative.

Nor are technologies.

Nor is any given place – a classroom in a school, for example, or online or in the forest or at a museum. In each case it can become a place for a practice of love, but it does not in itself make possible a practice of love which occurs in the vital contact between the teacher and the student. Nor do they prevent it as is too often argued about online spaces as if simply being physically in the same room guarantees learning. Or that distance prevents it. Virtual spaces outside of the actual in either time or place (prayer, poetry, story, myth, the songs of ancestors) have long been in use for practices of love. Even as no space is entirely separate from others (even before the blurring made by the digital, children have escaped the confines of classrooms through daydreaming). Nor is any one place better or worse than another except in what it makes possible: each has its own dangers and opportunities (McLuhan, 1995). No environment – and technology is environmental – is neutral (Heidegger, 1977). Forests make different things possible than classrooms and has its own dangers; the virtual opens possibilities through access, and yet with that very access, new dangers arise. The attention of love within any environment is to what is expansive (grows) *and* to what might injure (which is never loving). Authorization does not make a practice loving (which is always intimate and therefore near even when distant) nor can any authority guarantee, despite guarantees in policies and programs, the prevention of injury. *Attention* is required wherever one teaches.

Indeed, whatever *dictates* to teaching, whatever is handed *down* to teaching as authorized (in other words, positioned as better) and prescribed for use or packaged *as* teaching is a mechanization of teaching (technology puts it to use) and therefore detrimental to its art, and of greater concern, is therefore injurious to children, who are *not mechanical*. Prescribing or

packaging anything, social emotional learning or mindfulness or artful practice, mechanizes it. Personalization is a mechanization of intimacy. Mechanization is an attempt to *engineer* better results as defined by metrics outside of the experience itself. Those “better results,” Heidegger (1977) points out, are “directed from the beginning toward furthering something else, i.e., toward driving on to the maximum yield at the minimum expense” (p. 15). They are not concerned with the concerns of *education*.

Yet this is not to argue against technology. Mechanization is not *itself* a problem and can, beyond doubt, be helpful, and indeed, it is only within the environment technology makes that a teachers' science can become possible. The problem is when what is mechanical (standardized, generalized) is positioned as above what is intimately known. When it is positioned as “reproductive, rather than revolutionary,” Felicitas McGilchrist argues (in Costello et al., 2024), the technological can become a *resource* that is helpful, when it is helpful, within a limited set of situations. Such limiting is necessary for any resource. Its usefulness cannot be defined outside of its use in a practice of love.

Whether technology is cognitive only or affective or even generative, it is reproductive, and while the model of education is focussed on “better knowing,” it, too, is reproductive.

Seymour Papert, who had dreams of computers as revolutionary for education, despite disappointments, contributed to a manifesto for the consideration of affective technology in schools as companion:

A learning companion will not be an intelligent tutoring system that already knows the answers about the subject being learned, but rather a player on the side of the student – a collaborator of sorts – there to help the child learn, and in so doing, learn how to learn better. (Picard et al., 2004, p. 261)

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George Siemens (2024) predicts that, given current research in AI, such a companion will very soon be commonplace. He argues that AI is best understood not merely as a new technology but as a new species that can not only assimilate all prior human knowledge, but also organize, synthesize, and reproduce it instantly in multiple forms. It can already take even some of the most difficult tests (entrance exams for law and medicine, for example) as proof of its ability. In other words, AI knows better than any one human about what is usually considered knowledge of worth (what fills our textbooks). This new species, he says, will very soon become “a buddy” (14:03) that goes with us everywhere.

Of course, AI, as Dan McQuillan points out is not a new or alien species at all: “It started within society and that’s where it operates” (McQuillan, Jarke & Pargman, 2023, p. 361). Indeed, he says, it has a facility “for being adopted by existing technologies such as bureaucracies and institutions” (p. 361) and accelerates, intensifies, and scales up those systems that are often harmful to the most vulnerable, who are excluded from opportunities for better living by the calculations (augmented and invisibilized by AI) that bar their access. Moreover, he adds, AI is “simply completely incapable of having any understanding of the world whatsoever” (p. 365). It epitomizes knowledge without wisdom. Such a “buddy,” that cannot have *an interest* in our children, or keep their interests at heart, one whose “blankest of stares” (Dewey, 1929a, p. 220) is *without concern* for them, is a dangerous one.

Moreover, for all its power, AI is a pebble in the vastness, and only another layer for our many layers of maps. For education, any knowledge or any technology (books, for example) can only become *educative* when it is *in relationship* at the vital contact between teaching and learning, in other words, as I have been attempting to show here, when teaching is a practice of love rather than imposition. Once books, dance, art, digital technologies, however designed,

however powerful, are enfolded into education as *knowing better*, and teaching as *getting* children to know better, they are no longer companions but *collude* with those who know better. Shakespeare imposed on readers has little to teach them.⁸⁵ Or Arthur Miller. Nor even James Baldwin. Certainly not ChatGPT. Indeed, if education is knowing better, then AI is a real and present danger, its very speed and strength vanquishing other ways of knowing with greater efficiency than other colonizing forces to date, so that Heidegger's (1966) prophecy comes true: "The approaching tide of technological revolution... could so captivate, bewitch, dazzle, and beguile [humans] that calculative thinking may someday come to be accepted and practiced as the only way of thinking" (p. 56). We are, then, inextricably trapped.

Yet as only a layer within a practice of love, in service of it, AI *can* become a helpmate, if not a buddy. Indeed, one way it might do so, education researcher Dana Karout (2024) suggests, is by "moving us past our certainty and expertise, toward a space of unknowing" (para. 29) so that our focus shifts from seeing the technical fixes and expert answers that generative AI mines as an *end*. Thus, the already-known answers are not what we take up but what serve as a beginning beyond which it is possible to open into fecund, improvisational, and collective thinking, imagining, dreaming.⁸⁶

Nor can art (and teaching is an art) be *produced* by technology, not even by AI, no matter how "good" such art is ("good" according to predefined criteria), like art mechanically produced by humans, the "cold brain spun work" (Tolstoy, 1904b, p. 121) of reproduction or imitation.

⁸⁵ Arguably, this exposure to texts can allow some children to learn with the text, but, by and large, these are children who are already privileged with rich connections to the text via a background of reading, conversation and experiences.

⁸⁶ Once in this lesser role, it might be possible to ask next – is the cost of AI (to the environment, in exploitative labour, as well as in funding) – worthwhile? After all, for the purpose described, one need only gather together a room full of people, ask them to generate all their ideas on a given topic and then once generated, tell them to discount all of them and think of something else. Or one might engage more routinely in speculative, inventive and imaginative research.

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Both are *bolstered* by education as imposition where the goal is to meet external criteria and, indeed, the use of “examples of excellence” as models for students to imitate is a “best practice.” In other words, education as reproduction. Yet such work is not *living* art which is made in making. What is made cannot be pre-stated. When we attempt to reduce art to a set of rules to follow or tasks to complete or criteria to achieve or models to imitate (and AI is very good at reproduction and is, therefore, within the goals of traditional education, which is a mode of reproduction, a model learner), we miss what cannot be said but is only felt, when it is felt, in experience. Art *is* experience. This is not to say that what is mechanically produced cannot be *felt*, but it is not because of its product, however “good,” but its capacity to touch the one who experiences it. As Viktor Shklovsky (1917/2016) says, “Art is the means to live through the making of a thing; what has been made does not matter in art” (p. 162). The question – is this art? – is irrelevant. Again, art, as poet W. H. Auden (1940a) writes, “makes nothing happen” (line 36). It is “a way of happening” (line 41). Art does not reproduce what already is. Art, Erin Manning (2013) argues, is a “feeling-forth of future potential” (p. 47); it is “the memory of the future” (p. 47). As such, what matters in art is not how it defines itself – or is defined, described, prescribed, evaluated – but “how it is capable of creating new conduits for expression and experimentation” (Manning, 2013, p. 55). In other words, *expansiveness*.

Nor can technology serve art by controlling for quality, since it can only do so through calculations against what is already produced. Quality control is not a concern of teaching's art and is, more often than not, *miseducative*.

I once listened to a woman tell this story. She was in fourth grade at the time and the class was going to draw a bear. The teacher showed them how they were to draw the bear, but this little girl, who loved to draw, already had an idea in her mind. So when the other children

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drew the bear in side view as demonstrated, she drew the bear from the back, with the bear walking away from the viewer. She was very happy with her drawing when it was done and handed it in to the pile at the front. Then her teacher went through the pile and picked her picture up. Her heart gave a little lift. Was the teacher going to praise her beautiful picture? The teacher got the attention of the whole class and said, “Do you see this picture? The person who drew it did not listen to the instructions.” And she ripped the paper in two.

The girl, now a woman, said that for the rest of her school years, she was in terror of getting it wrong. She never drew again unless required.

This terror of getting it wrong is pervasive in schools. Even if the tearing up of a child's offering is disguised by getting the teacher to use different methods of assessment (emoticons, for example, or self-assessment) or through social-emotional strategies (positive feedback). Even if the process is taken out of the teacher's hands, since too often they get it wrong, and given to computer programs that impersonally “personalize.” Thus, such a program can capture data from students so that content is “rendered” with “resources relevant to his or her profile, learning goals, and the knowledge domain the learner is attempting to master” (Long & Siemens, 2011, p. 38). The assessment nudges, rewards, encourages with “just right” pressure so that she “gets it right” – the bear is drawn in side view.

The focus is on getting the student to get it right – and getting thereby rewarded – rather than on the experience if it is an experience at all.

An experience requires participation rather than the thoughtlessness of moving as automatons (as though the student is mechanical) to get things done in the quickest and cheapest right way (Heidegger, 1966). An experience is *felt*. A miseducative experience awakens us to dangers. The greater danger is the mechanization of what is miseducative.

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Yet when education is seen as an acquisition that allows some of us to reach the pinnacle of achievement, a doctorate, for example, the highest rewards for “getting it right,” then quality control – verification – is necessary. How else can we be sure that those on top deserve to be there? Recently, when our students spent time on the land as a way to become teachers in Nuu-chah-nulth territory, parents asked what *proof* we had that the experience, this “loitering” on the land, would improve *achievement* for their children. They wanted to know what evidence we could provide that the teachers, the programs, the university policies (including such anti-colonial practices) would effect arrival at what they perceived as the destination of education, first for the teachers, so they are “the best” in their field, and therefore, through them, the success of their children (high marks, scholarships, entry into the best universities). Their questions stem from the responsibility of their love for their children and while success through education is getting it right for getting ahead (that is, economic prosperity) rather than toward just futures, the question demands care and gentleness rather than the accusations of racism that quickly ignited: the question points to important failures for possibilities of otherwise.

Indeed, the compulsion to get it right, the idea at the heart of modern science, is another form of the terror of getting it wrong.

Love is a different metric.

It turns toward growth in all its manifestations, this blossoming, this beauty, this extravagant diversity.

Given the richness, the variety, the abundance of resources available to us, when once we “undo the folded lie” (Auden, 1940b, line 78) that has been authorized (that we must do as we are told or else) and are pierced with the revelation that “we must love each other or die”

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(Auden, 1940b, line 88), all obstacles are as tissue paper and everything that seemed an impediment becomes a catalyst.

Technology, which cannot think for itself, can only propagate what-is.

Inside the paradigm of knowing better, even the most advanced digital technologies reproduce its existing structures; outside of it and within a practice of love, they have the potential to become instruments for living into our dreams. In our day to day, they become as helpmates, reminding us of what is already known that is a beginning we harvest with gratitude so we may move more generatively into other futures. Our university, with them, are loosened, are opened, are able to blossom into wider becoming, moving into communities, not as colonizers but as pollinators, learning with local experiences and carrying the sweetness between communities. Or in teaching teachers, experiences in schools with children can become the centre of learning, not something tacked on and separate, either by moving the university to the locality or bringing the schools into the university. Or professional development might become entirely enfolded into the experiences of teaching such that researchers live with teachers in their day to day. Or conferences, which would no longer be needed to inform or to promote the newest new, can become opportunities to widen, extend, open, heal, so that when many researchers gather, wherever they gather, they gather in places to learn from and with the place itself. Research, thus, become enriched through the diversity that abounds there and, too, can extend its invitations to everyone with a concern for the question posed so that it can become infected with variety and infects widely.

Our screens can become a table turned on its side (Higham-Stainton, 2022), a place for gathering, for posing concerns that matter for teaching, for offering ideas, for verifying in practice, for noticing patterns, for mapping transparencies, for translations, inventorying, for

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organizing openness, for creating curiosity cabinets, for ongoingly adding to or revising patterns, for sorting and re-sorting them. For localizing them. With technology the table is protean, Rose Higham-Stainton (2022) argues,

By protean, I mean a looseness, a tendency to change; the ability to do many different things. I mean, adaptability – a table as office, accidental canvas, cut-and-stick page – and shifting in meaning. I mean all the qualities of the table – its gravity, its capacity to gather us, its generosity – without the solid base. Or rather, the base exists, it just looks different now. It is unsteady – this table – but it is open. A table that suits this space we're in, with its shifting social practices and domestic rituals, themselves a consequence of technology, displacement, borders. (para. 2)

Such a table makes a new space, a better space, for our gatherings.

Thus technology, instead of an instrument to speed up, can allow us to slow down, not to simplify things but to layer them, not to reduce but to multiply, not to restrict what counts and who counts but to open out of counting. What is more, to sit together at the kitchen table (whether it is digital or not does not matter) signals the setting aside of the “distance-making” (Le Guin, 1986, para. 5) of the father tongue that enables a focus on methods, data and analysis and the knowing better of transmission. Instead, it is intimate, turning toward what is *of interest and concern* between us and is enabled by reciprocity, relationship, pluralities, toward the expansiveness and generosity necessary to our love for our children and the dreams we dream when we send them to school.

And distance education, then, becomes *a way* for nearness.

Hallelujah

You have probably noticed that all along, as I have meandered, loitered, lingered, turning at dead ends to begin again, trying, always, to seek a way out of the maze of our father's making, I have been drawing a facing-away bear, or perhaps dancing this dissertation: it is not what has been asked for.

I am not doing the dissertation right.

Yet is it important that I get it right?

Or that you do, you who are, already, an "unfailing sufficiency" (Whitman, 1856, line 44)?

Or is something else more important for our work together?

"If a new candidate for paradigm had to be judged from the start by hard-headed people who examined only relative problem-solving ability," Thomas Kuhn (1996) argues, "the sciences would experience very few major revolutions" (p. 157). Instead, he says, a decision between alternate ways of practicing science "must be based less on past achievement than on future promise" (p. 157). In other words, it must be a harbinger of hope in the sense that Vaclav Havel (1991) describes:

Hope...is not the same as joy that things are going well, or willingness to invest in enterprises that are obviously headed for early success, but rather an ability to work for something because it is good, not just because it stands a chance to succeed...Hope is not the same thing as optimism. It is not the conviction that something will turn out well, but the certainty that something makes sense, regardless of how it turns out. In short, I think that the deepest and most important form of hope, the only one that can keep us above water and urge us to good works, and the only true source of the breathtaking dimension

of the human spirit and its efforts, is something we get, as it were, from 'elsewhere.' It is also this hope, above all, that gives us the strength to live and continually to try new things, even in conditions that seem as hopeless as ours do, here and now. (p. 181-182)

If we look up from a fear of getting it wrong, out from carefully tended boundaries, dug-in positions, the battles for control there, and shift our focus from proving within those boundaries to loving which can neither be proven nor contained, but, indeed, is the rich soil in which hope flourishes, then every breach – this dissertation is a breach – is a possible miracle or an important failure that can point us in the direction of justice and truth – *if that is our direction*. Indeed, if it is, then as Dewey (2003) argues, “The only thing that in the end can be fatal is cowardice that refuses to make a choice as to the kind of world we want to live in and then withdraws from a struggle to bring it in existence” (LW.17.476).

The *if*, however, is the crucible by which my invention fails or lives.

If it fails, I have failed in my promise to Paul, my long-ago student who I have continued to make and think and dream for, when he said to me, “Let’s really *do* something. I know you can make it happen.”

I know now, at last, that I can *make nothing happen*.

But if we believe our work in education is a dream we dream for our children, this future promise of a better world, a beautiful world, a just world, an as-yet unrealized world that we have no proof can exist nor a clear sense of what it would look like, then ours is a practice of love whose making is made true through our faith in dreams. It is *a way of happening*.

That way is revolutionary.

You and I do not need to storm the bastille or stand on a soapbox to become revolutionaries. Indeed, quite otherwise. We must make the way in the way we can, where our

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dreams, as William James (1907/1981) says, “are *live* possibilities for we are their live champions and pledges” (p. 128); they become actual by our acts, which, thereby, can “create the world’s salvation so far as it makes room for itself, so far as it leaps into the gaps our dreams make” (p. 129).

And more, the way is *made true* by our faith in each other to contribute.

Otherwise, how could we leap? William James (1912) describes the consequence of faith – and lack of it – in uncertified results:

Suppose, for instance, that you are climbing a mountain, and have worked yourself into a position from which the only escape is by a terrible leap. Have faith that you can successfully make it, and your feet are nerved to its accomplishment. But mistrust yourself and think of all the ... things you have heard the scientists say of maybes, and you will hesitate so long that, at last, all unstrung and trembling, and launching yourself in a moment of despair, you roll in the abyss.

Or here, to fulfil the promise of education, where we must trust each other, where to leap alone is not enough, we must also hold out our hand such that “the trust of our held-out hand is a trust in another hand’s trust, a trust in another hand’s trust in our trust in theirs” (Savransky, 2021, p. 156).

There are no guarantees in this life and as Leonard Cohen says, “the world is full of conflicts and full of things that cannot be reconciled” (in McKenna, 1988). Understanding this, he says, is what he means by “Hallelujah.”

Because when we surrender to our own limits, we can transcend them.

This model for a teachers’ science, which makes ways for education’s revolution, does not, cannot, promise that, once made, everything will be better. What can be certified by it when

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“our science is a drop, our ignorance a sea” (James, 1912, p. 54)? What can it know (except in whispers, dreams, miraculous moments of revelation) of the whole outside its own limits?

Indeed, this new model for a new science does not offer new knowledge or better proof and does not dismiss the long-accumulated knowledges of teaching. Yet seeing from its different centre changes what becomes possible to see.

When we only see a dog-eat-dog world, we want to make our children into the biggest dog, the one with the most competitive advantages and school is where they sharpen their capacity to succeed in a dangerous and violent world. To accept competition (to fight, to win, to get to the top) as necessary is to acquiesce in the way it is even if we shift the parameters so different people can be "included" in the competition (women, IBPOC, disabled people) so that more of us are complicit in advantages that disadvantage others. Instead of education making other futures, we keep our children in the world we want them to escape, and teaching is little more than an instrument or mouthpiece of control that guards the gates to other futures.

And yet, it *can* be otherwise.

There can be “sunshine, love, salvation” (Stafford, 1998, line 3).

If we see, rather, that there is a chance, by taking this chance on each other, with each other, for the children to create more just and beautiful futures by living in them now with us in our every action, then school is no longer a place of divisive and exhausting competition, but a place of gathering in community (online, on the land, in classrooms) where the gifts of children are nurtured through experiences that change the shape of the landscape in their lives, that allows them to see colours they did not know existed, to hear music beneath the cacophony of life, these revelations, and to create with and from these experiences futures that have not yet been imagined but have been longed for, always.

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And then everything is different.

We cannot know for certain, it is a chance only, but oh, is it not worth living for?

Let us leap.

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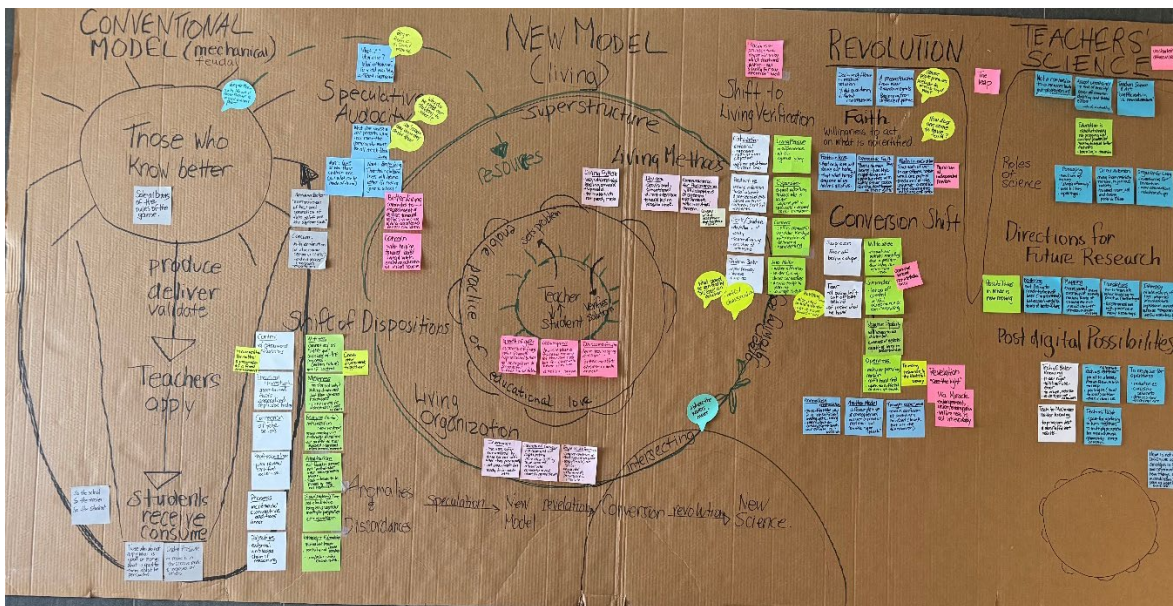
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Appendix 1: Illustration of text



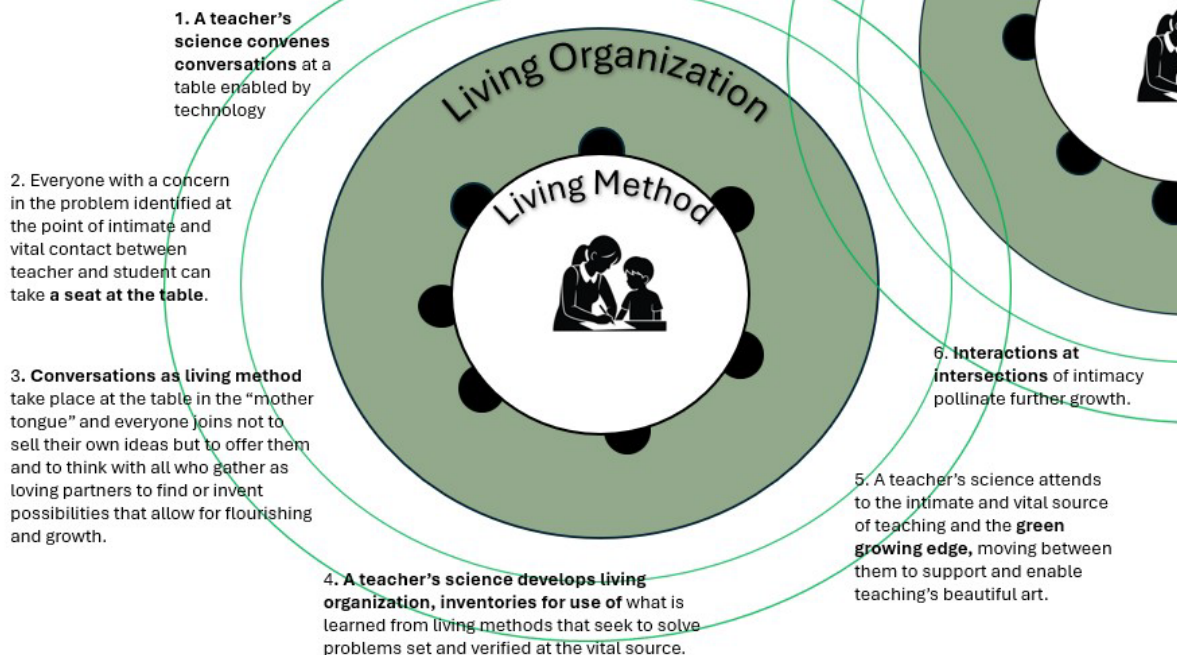
Digital version available at [this link](#).

Description Note: In an attempt to visualize the text, this poster, made with cardboard, sticky notes and markers, moving left to right, begins with a closed loop top-down conventional model of knowing better. Via speculative audacity, an awareness of anomalies and a shift of dispositions (listed with sticky notes), a new model is made *outside* of it that is represented as circles in circles. The teacher-student relationship is at its center and is richly nourished by a circle of support and resourced from expertise developed through conventional sciences and many other knowledges and verified at the living center. These verified resources are organized for inventive use, another circle, which grows outward as the center grows, connecting and replenishing at intersections of other (also growing) circles from other living centers. But to become a science, the model must move next from representation (this flat image) to living hearts, heads, hands: there must be a revolution – a conversion to its ideas – and a leap of faith to make the new science with which new directions and postdigital possibilities can be created.

Appendix 2: Diagram & overview of the model for a teachers' science

A Model for an Intimate Science for Teaching's Beautiful Art

All the rest of the systems, organization and administration is really so much superstructure for enabling the classroom teacher to do his or her work. ~ John Dewey.



Description Note: A white circle – or “table” - with a silhouette of a teacher and child at the center of it and “chairs” for all those with a concern for concerns at this point of vital contact. This is labelled “Living Method.” Around the “table” is a green circle that is labelled “Living Organization.” Green rings move outward like ripples from the center circles and intersect with ripples from other “tables.” Included is a text overview of the model: 1. a teacher’s science convenes conversations; 2. everyone with a concern takes a seat at the table as loving partners; 3. conversations are the living method to find or invent possibilities for growth and flourishing; 4. what is learned is organized in inventories for further invention; 5. a teacher’s science attends at the living center, to the green growing edge and 6. at the interactions at intersections of living work to support and enable teaching’s beautiful art.