

Title:

Ethics and the Richness of Being in/for Mathematics Education Research

Author information

Name: JEAN-FRANCOIS MAHEUX

ORCID: 0000-0003-4929-9763

Email : jfmaheux@mail.com

Affiliation : Université du Québec à Montréal (UQAM) - Laboratoire Épistémologie et Activité Mathématique (LEAM), Canada

Address:

5166 Baldwin

Montreal, Quebec

H1k 3B2

Canada

Ethics and the Richness of Being in/for Mathematics Education Research

JEAN-FRANCOIS MAHEUX

jfmaheux@mail.com

Université du Québec à Montréal (UQAM)

Laboratoire Épistémologie et Activité Mathématique (LEAM)

Canada

ABSTRACT

In this chapter I engage with Feyerabend's philosophical ideas in the context of mathematics education research. I concentrate on Feyerabend's critiques of scientific reductionism and his later work, exploring the constraints of conventional rationality in scientific endeavors. In this chapter, I engage with Feyerabend's philosophical ideas within the context of mathematics education research. I focus on Feyerabend's critiques of scientific reductionism and his later work, delving into the constraints of conventional rationality in scientific pursuits. This exploration prompts questions about universal answers in the field of mathematics education research. Shifting from theoretical discussions to a more tangible setting, I draw a contrast with a real-life classroom episode. I highlight a teacher's efforts in guiding discussions, fostering dialogue, and showcasing the ethical and mathematical significance of nurturing collective mathematical thinking. In the next section, attention shifts to an incident within the Mathematics Education and Society (MES) community. Triggered by discussions on the war in Ukraine, this incident sparks debates about the scope of the MES mailing list. My analysis navigates through the intricate dynamics of facilitating diverse discussions while maintaining a focused discourse on mathematics education. In conclusion, I advocate for a reevaluation of traditional educational paradigms, urging researchers to consider alternative approaches that not only recognize but also celebrate the richness of being. Such a shift encourages the promotion of diverse ways of knowing within the field of mathematics education.

KEYWORDS: Mathematics Education Research, Scientific Reductionism, Dialogical Engagement, Epistemology

Feyerabend and the richness of being

Feyerabend was always concerned with the oversimplification of the complexity of human lives and experiences. With his famous book *Against Method*, he patiently crafted an argument as a turn in a conversation with his friend Lakatos. As most of us know, the book insists on how the actual work of scientists is much less “rational” than what we commonly assume. Feyerabend appreciates Kuhn’s effort to describe scientific developments more accurately and credited Lakatos for revealing “attempts to cover up difficulties” in our understanding of how mathematics historically grows (e.g. Feyerabend, 1975). But, he explains, these accounts still picture scientific life as essentially rational, and this is not enough. Researchers are never merely logical beings. Much more than rationality always come into play, whether one acts as a scientist, or as a mathematician, or at any actual

moment of his/her life. Feyerabend wants us to acknowledge and even embrace how human experiences and endeavors (such as science and mathematics) are not reducible to principles, let alone those inspired by logic.

In his late life, Feyerabend worked on a project that came out in the form of a book titled *The conquest of abundance* (1999). The book is a moving tribute to “the richness of being”, and a constant warning against our tendencies to reduce and “abstract”, hope for global and secured explanations, models, and so on. Throughout the book, Feyerabend alerts us to how answers to the kind of questions we tend to ask would serve not only a reduced form of understanding of what we observe but also conducts our actions (on the basis of such reductions). The second part of the book contains a chapter explicitly dedicated to the *ethical* dimension of this situation. In the following pages, I will discuss how Feyerabend’s ideas on ethics and science can connect with research in mathematics education. The claim is quite simple: *it is highly questionable from an ethical perspective to look for universal and certain answers regarding what happens in mathematics education*, including what might be the “best way(s)” to teach mathematics. But this observation has not been very clearly articulated in the field yet, and I think we should better highlight its consequences. More precisely, I will briefly argue in favor of approaches to research that *open* possibilities and create conversations, rather than attempts to provide answers and thus stop dialogues. I will conclude with a short reflection on an event that recently took place in the *Mathematics Education and Society* (MES) email list regarding the ongoing war in Ukraine. What happened there also strongly connects, in my view, to what Feyerabend draws our attention to.

Ethics as a measure of scientific truth

In the book I just mentioned, Feyerabend (1999) wrote a brief piece on ethics as a comment on a Chinese astrophysicist and dissident’s speech in which the scientist praises “modern civilization” and its quest for “universal” truths through science. Feyerabend argues that the scientific scheme to explain everything (or, at the least, as much as possible) is a totalitarian project first for its aims at replacing all forms of knowing or wisdom with the scientific way of knowing, but not only that. Science’s specific way of knowing is also questionable for its endeavors against singularities. It looks for models that ignore idiosyncrasies and all forms of individual, contextual, time sensible discrepancies. Science sees them as noise, or negligible bits. This is where the ethical problem starts.

But even more than that, Feyerabend warns us, scientific thinking might eventually want to get rid of such peculiarities. Analyzing a quote from Peter Medawar’s *The Arts of the Soluble*, Feyerabend writes: “A scientific approach, says Medawar, ‘annihilates’ [idiosyncrasies] and ‘relieves’ science of their ‘burden’” (p. 250). This is a rather recurring science-fiction theme explored in Huxley’s (1931) famous novel *Brave new world* for example, in which he brilliantly gives a taste of what “intelligence-based” social engineering could look and feel like. Fiction here only amplifies everyday forms of fascism that are very close to us (e.g. Giroux, 2018). Feyerabend offers an exemplification, turning to the Ceausescu regime in Romania to highlight this danger:

Ceausescu did in practice what the hypothesis (and Medawar) do in theory. He tore down idiosyncratic ancient villages, suppressed idiosyncratic local beliefs, and replaced them by monsters made of concrete and a uniform ideology. You object that it is unfair to mention Ceausescu in the same breath with the universality of science? I don't think it is. (p. 250)

A so-called “objective science” serves to discriminate what counts or not in order to weed out “‘irrational’ idiosyncratic kind of life” that appears to slow down or go against a certain image of “progress” and “universality”. In his novel, Huxley explicitly tackles Henry Ford’s model and

ideologies, which are also very close to the basic principles of Frederick Winslow Taylor's *scientific management* (we will come back to it in a moment).

The question I want to ask now is this: how much of what *we* do as researchers in/for mathematics education aims at overcoming local, individual, and momentary specificities? How much of what *you* do as a researcher concerns epistemic students, classrooms "in general", supposedly "average teachers/students", and so on? How much is about getting *all* students on the *same* boat? A boat that *we* design, contribute to, or at least accept as stating "what matters", what should be learned. How often do we unquestionably decide what "knowing" or "understanding" looks like, according to *our* criteria, following *our* aims and goals? Let's for example have a look at the following fragment in which a group of second-grade students sits at their desks, while an adult, Rachel, stands at the blackboard.

Seven sheets of paper, each presenting a rectangle the students drew using the same piece of string, are aligned up on the board as the result of a sorting activity (as represented in figure 1). Rachel questions on the number of squares in each rectangle (their area) before focusing attention on the perimeters:

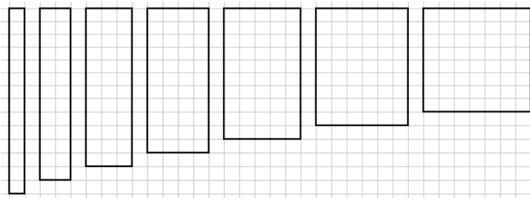


Figure 1

Rachel: Tom, what was the same about all these rectangles? They all have...

Tom: These two ones...

Rachel: Oh, but we are talking about all these rectangles, all of them. They all have what?

Tom: They all.. have... I don't know

Luc: Hum.. They are all rectangles because they are tinier than squares, they are longer and skinnier

Rachel: What else is the same about all of them? Melinda?

Melinda: They all have 4 edges and 4 vertices

Rachel: They all have 4 edges or 4 sides, and they all have 4 vertices or 4 corners. And here is something else. They all use the same ... did we use different loops of string? Did you use a different loop of string for each rectangle?

Students: Noooo!

Rachel: They were all made with the... same piece of string! Yet, they made very different rectangles from the same piece of string.

Figure 1. Fragment of a classroom conversation

What are questions a researcher could ask based on this fragment? How should it be analyzed? What could be the result of such an analysis? What kind of conclusions and implications should we derive from answering these questions? We might for example ask if the sort of "student-centered" activity featured in this episode is "the best way" to teach mathematics. We could detail how well Rachel carried it out or not. We could wonder what preparation is needed (for teachers and students) for this to be successful. In relation to all this, we could try to pinpoint what exactly the students might, should, or could have learned or understood from the activity or the conversation. More critically, we could also focus on participation for instance to see if equal chances were given to all. Is authentic

“negotiation of meaning” taking place? Are the students (and the teacher) instruments or subject to institutional or ideological systems? And so on.

The other interrogation is: what are we to do with answers to such questions? Do we simply hope to figure out what is “really” (or “more importantly”) going on in the class that day? Are we expecting to draw lessons for the future? To identify what to do and not to do? Is this what we would call “evidence-based scientific facts”? Perhaps this is not reduced enough, and some researchers might even call for further synthesis, or demand pre and post tests as a measurement of the teaching and learning? Should we rather use marks as tokens of success, efficiency, equity, rather than focus on a two-minutes piece of “evidence”? At the end of day, why are we doing all this? Why conduct research in mathematics education if not to improve it? What does “improving” mean?

Instruction, education, success, equity, they are noble aims. Of course, wanting to help as many people as possible is an admirable intention. How can it be wrong to look for “what works”? Should we not try to find ways to make more students or teachers successful, to devise means by which those who struggle can better achieve what is expected for or from them? Paul Ricoeur (1994) does after all present ethics as aiming for “the good life with and for others, in just institutions” (p. 172). This sound like a very sensible mission. But what we easily miss here is the way in which such questions and answers, such scientific approach to real-life events, operates from an intense reduction of life, and call for the formulation of imperative and laws reapplied to life in the future. Certainly, the desire to improve things is valuable. But, as we say, the road to hell is paved with good intentions. Following the same line of thinking articulated by scholars such as Ricoeur, Emmanuel Levinas (1981) or Francisco Varela (1999), Feyerabend insists on an ethics that starts from the particular, the situated: actual beings we encounter. This type of ethics is opposite to “categorical imperatives” sought out by Kant (*universal* principles stating what everybody should do or not at any moment, etc.). Ricoeur for example talks about solicitude, care, responsibility, and benevolent spontaneity. He places ethics, the *aiming* for the good life, as always above moral laws organizing institutions so these laws can be transgressed.

This also connects with Heidegger’s (1954) concept of *Sorge*, a fundamental opening to the world. At the opposite of *Sorge*, we find modern technological thinking, described as a wish to order and control. Heidegger thus explain how “the power of technical control over nature made possible by science is extended today directly to society” (p. 173) affecting culture, education, and in fact all social life as “technocratic forces strive to master nature by controlling and overwhelming rather than working with it” (p. 35). Unfortunately, *a lot* of research in mathematics education seems to be conducted in this spirit, against which Heidegger protests. Trivial realist ontologies and epistemologies are still very present amongst us, perhaps because they fit best our expanding (now “global”) culture rooted in individualism, autonomy, democracy, economic liberalism, and so on. A culture that leads to the exploitation of the world (including people) to a degree that resulted in the rapid extinction of countless, entire species and now clearly menaces human existence itself. We want to make school and mathematics education *work*, without too much reflection on what it does to children, especially in regard to diversity. Nearly all schools and mathematics education are designed with and implement some kind of “standards”. Curricula are prefixed, children are grouped based mostly on age, and their actions/capabilities are “assessed” using identical examinations and so on. Most of us have heard about Robinson’s “paperclip” study (in which he observed the drastic drop in divergent thinking among a group of children between 5 and 8) and his general argument against the standardization created by the school (e.g. Robinson, 2001). How mathematics education research is connected to the re-production of these systems is certainly vast and complex, but also rarely re-examined and, I believe, thought about by researchers themselves.

Material for such inquiry is often readily available, however. In the fragment above, we sense a desire to get to certain ideas: all these rectangles have the same perimeter, but different areas, perimeter and area are different (and somehow unrelated) concepts, and so on¹. These are “learning objectives” explicitly mentioned in the state’s curriculum, and they were part of the lesson plan. As such, they also help us make sense of why Rachel ended up asking the rhetorical question “did you use a different loop of string for each rectangle?”, and why we feel like the students were merely expected to see and mention that idea rather than creatively engage with the drawings. As researchers in mathematics education, do our projects more often aim at getting students to see and say something precise? Aren’t our research endeavors in good part about ensuring student meet their teachers’ expectations? The states’ expectations? Our expectations? Recasting such required outcomes in terms of competencies does not evade this critique. Blaming Rachel’s interactions with the students for not developing enough their problem-solving abilities is still using research to set (or at least support) demands for students and teachers to conform to a certain type of behavior. The ethical dimension related to mathematics education research I have in mind is now very clear, and in a way resemble that of mathematics and mathematics education as articulated a few years ago by Urbitan d’Ambrosio (e.g. 1998, 2007) around a simple question: How do we, as mathematicians and mathematics educators, fulfill our commitments to humankind?

We all laugh at the cartoon in which a sitting bald man lines up animals (a monkey, an elephant, a penguin, a fish, etc.) and says “for fair selection everybody as to take the same exam: please climb that tree”. And while many among us recognize our education systems in this, concretely taking a stand against it is not that easy. How can we do this as researchers? Wanting to help students learn this or that is still precisely supporting a system that dictates learning outcomes. Debating whether something should come first or second (for example fractional versus decimal notations for numbers) is also part of a quest for a “one fit all” model. And advocating for school to offer various “pathways” to students is not that different: it still amounts to putting a person into a box. There is also a deep and difficult epistemological question behind this, which challenges good-hearted calls for inclusion and diversity. Looking into how systems could be improved is still supporting the systematization of human life, of students’ experiences, and so on. The problem is not just uniform or standard assessment, but assessment itself, especially when taken as a somehow accurate reflection of “what is”. And the same goes when it comes to research: the notion of “best” practice, the idea that one approach is objectively better than another, the belief in measuring how good or bad some things are... these are all problematic aspects of science and technology as highlighted by Heidegger among others.

In his doctoral research and his subsequent writings, Jim Neyland (2001) makes an excellent case against scientific management in education from an ethical perspective. He debates against the replacement of ethical responsibility by the kind of technical accountability that comes with the belief that some things work, and ought to be (correctly) implemented and so on. His proposition is very close to Feyerabend’s (1999) invitation to start from “these lives themselves” (p. 268). Neyland (2004) argues against “instrumentally oriented research to aid rationalistic decision making” (p. 59). Through it, educators work more and more “for the faceless voices of authority enshrined in legislation and outcomes statements – and less and less for themselves and their students in direct (ethical) response to individual learning situations” (Neyland, 2007, p.115). Feyerabend similarly

¹ Let’s note also how the conversation is close to ideas such as “having sides of equal size maximises the area in the case of rectangles” and even “There is a quadratic relationship between side and area: $A=15s-s^2$ where s is the length of one of the sides”.

opposes scientific endeavors and its notion of objective scientific “reality”. He asks us to attend to actual people, orienting ourselves toward welcoming, celebrating, preserving, and nourishing diversity, ambiguity, uncertainty, and so on. Unfortunately, Feyerabend died before he could write the final chapter of his essay, and perhaps elaborate on what ethical research might look like. In the next section, I present my interpretation of some aspects of this in mathematics education research.

Celebrating abundance... in mathematics education

Feyerabend’s perspective directly contests the notion that mathematics education research should be about finding out “what works” in teaching and learning. Indeed, the search for certainty and the notion that some ways of teaching could be objectively and generally (maybe even universally) better than others can easily be connected with control, dominance, intolerance, and so on. If there is a best way to do things, all those who refuse it are at least suspicious, probably subversive! They should be investigated, trialed, and when found guilty, secluded from those who know and do good. The popularity of “evidence-based” education is concerning in this regard. Charlatans and zealots of all sorts already boarded that ship, making extremely questionable claims. The pseudo-scientific yet massive argument constructed by John Hattie and his team is a great example of this. It is both a case of wanting to impose one way of doing by relying on science and data, and a case of believing so much in what one wants that shortcuts, bents, misinterpretations, and active blindness completely wipes out the scientific quality from the argument (see for example Maheux, 2017).

What more ethical research could look like? Some answers can be found in Paola Valero’s (2004) chapter on *Postmodernism as an attitude of critique to dominant mathematics education research*. Reflecting on how postmodernism translates in her work as a mathematics education researcher, Valero precisely articulates concerns regarding the dominant tendency to consider epistemic students as opposed to actual, socially, and culturally situated people. She illustrates the importance of, for example, investigating why some students don’t engage much in classroom activities based on their intentions to learn, how they relate to mathematics, and how their socioeconomic or cultural background and actual situation might play into this. Bal Chandra Luitel’s (2012) approach to researching lived mathematical experiences moves in a similar direction, arguing for the use of “multiple genres and logics with a view to demonstrate the complex, iterative, and pre-supposing nature of analyzing and envisioning” (p.101). He promotes for example inquiry into one’s own lived mathematical experiences and to appreciate the quality of research work in mathematics education with criteria such as incisiveness, subtleness, or lifelikeness (p. 108). Luitel also mentions “transferability as feasibility in other contexts” which requires some elaboration. This criterion does not concern the reproducibility of research outcomes, but how research could generate more research: for example on similar questions or phenomena, in different situations, and so on. This is what Jérôme Proulx (2015a) more fortunately called the *generativity* criterion while explaining that “the goal of research is to generate new ideas, ways of thinking and distinctions, and it is not to offer answers” (p.3). Proulx (2015b) connects this with the idea of conducting mathematics education research *studies* in a way similar to how studies are used in the arts: to test ideas, perspectives and ways of doing, as attempts to create modes of experiencing the world around us.

In *Against method*, Feyerabend (1993) insists that science as we know it would be better presented (in schools) as *one* way of thinking and doing among others, ultimately letting people choose what they want to believe. It is up to science to be convincing! This is a very challenging request, especially in a time where, as we know, disinformation is growing and increasingly used as a political tool to push certain agendas, shake people’s trust in democratic institutions, etc. (e.g.

Tenove, 2020). But perhaps it is time that we face this challenge while realizing that the very possibility of this threat was created by what Feyerabend shows to be the indoctrinating hegemonic features of the scientific project and discourse².

Here, social studies seem at least a few decades ahead. Following trends of postcolonial movements, alternative ways of conducting research develop in response to the condemnation of domination ideologies and practices. Poetic Inquiry for example, and other “art-based research”, well articulates the informative and transformative potential of conducting and sharing research in the spirit of revealing the complexity and intricacy of all kinds of phenomena, even in the natural science (e.g. Fernández-Giménez et al. 2019). A few years ago, I have claimed in a similar fashion (Maheux, 2010) that mathematics education research can use theories to “knit complicities in and through mathematics” (p.88). In that short paper, I argue and exemplify how theories can be used to emphasize not rationality but *relationality* as a key feature of embracing my ethical responsibility as a researcher and an educator. For me, a key step on such a path is the realization that:

Every human act has an ethical meaning, because it is an act of constitution of the human world. This linkage of human to human is, in the final analysis, the groundwork of all ethics as a reflection of the legitimacy of the presence of the others (Maturana and Varela, 1998, p. 247)

Going back to the fragment above, little is available to us about where Rachel, Tom, Luc, and Melinda come from, how they feel, why they are there, and how constrained they think they are in that brief moment of doing mathematics. But we can still examine the fragment and marvel at how they manage to bring forth this mathematical moment, and we can theorize for example about the role of *traces* in mathematics education. Drawn figures are hooked on the blackboard. They are remnants of a previous, different activity: doing mathematics leaves traces! Now the class revisits these traces with Rachel who is asking for an observation on the group they form: “What was the same about all these rectangles?”. The question reveals the ambiguous nature of signs and artifacts: they are not meaningful in themselves. Here, it seems like some things can be seen or said about the figures, but what exactly? Tom shows us that despite the call to consider “all these rectangles”, it might seem worth offering a contribution concerning only two (e.g. when nothing else comes to mind). But transgressing Rachel’s request was not accepted this time, which created room for Luc and Melinda to ‘state the obvious’ so to say: these rectangles are all rectangles (but not squares), they all have 4 edges and 4 vertices. In this, they do manage to characterize the group of figures, to make it significant, meaningful. Rachel verbally approves these interpretations of the traces but keeps asking for more, for something else to be spotted, recognized, conceptualized.

Reminding the students of how they created these figures (all using strings of the same length), she first insists on getting a statement about these particular rectangles, and not any collection of rectangles. This is useful because, as we see, the ambiguity of traces also concerns what traces are traces of. Are these random illustrations of seven possible rectangles? Is the arrangement important to what might be said about them? For example how they are all aligned to the top and evenly spaced? Or is *that* just one possibility among many, one that has nothing to do with “what was the same about all these rectangles”? Stating for the students that “they were all made with the... same piece of string” does not completely settle the issue: thinking about how the rectangles

² Some have suggested that this critique applies not to science but to “scientism” (e.g. Hansson 2018); however, I still believe that Feyerabend’s analysis goes beyond naïve views on science and does concern the very heart of the scientific project of “understanding” the world.

were produced does not immediately reveal what “they all have” (the same perimeter). The origin of the trace is brought back as significant to their (re)interpretation, but work still needs to be done: what’s the meaning of this, why is it important, and how are we supposed to use that information to highlight something about the rectangles?

It is possible to study the phenomenon of making sense of a series of figures in a classroom setting and not to draw conclusions on what should or should not be done, not to blame or to exaggeratedly prize and impose as a model (“best practice”!) what a teacher does. Such study can be about revealing the richness and the complexity, the abundance of life that comes into play for things to unfold the way they do. And wonder about the possibilities and all the questions opened by this. Conducting research as wonderment and fascination, in order to produce amazement and awe, curiosity and respect. And communicate research in the hope to open minds and inspire, instead of pretending to offer solutions and solve problems. Create more questions, not answers that removes the ones we have. A way to be true to what we call ourselves: not finders, but researchers.

Of course, there are still larger, e.g. political questions we want to address. What about all those social iniquities? Will this more ethical research be able to address how people suffer from discrimination? What about those who are forced into certain ideologies in and through mathematics education? Would it have anything to say about, for example, the Islamic State pushing its dogma through mathematics textbooks (e.g. Arvisais et al., 2021)? These are of course large and difficult questions. As a way in, I suggest considering Pierre Bourdieu’s work on issues such as social privileges, dispositions, and so on. A stunning example of the studies I have in mind is a collective book titled *The Weight of the World* (Bourdieu, 1993) in which the researchers study, analyze and write about the daily suffering of ordinary people, including teachers. This work illustrates what Bourdieu and Wacquant (1992) call “the summum of the art” in social sciences: “to be capable of engaging very high 'theoretical' stakes by means of very precise and often apparently very mundane, if not derisory, empirical objects” (p.120). I am convinced that such studies are not only possible, but also very important to mathematics education research.

This (fortunately) does not completely lift the vivid struggles of writing research once we embrace a post-modern attitude: as researchers, “what can we say about what we do and what does what we say do” (Cotton, 2004, p.220)? One enlightening avenue is sketched in Levinas’s reflection about text and what could be called an ethics of translation in regard to writing (e.g. Laygues, 2004). If writing research is mostly about knowing and communicating knowledge, it misses the ethical opportunity of being *for* the other in the way Levinas’s ethical philosophy articulates it. Writing for the other is not informing, but presenting a testimony, bearing witness, and through this both exposing ourselves as responsible for the other and everything we say about her (for example a teacher or a student we write about). By this, writing for the other also implies creating opportunities to encounter the other otherwise than by what can be known about her. It is about sharing common experiences, emotions (desires, struggles, etc.), a language, and so on. In return, such ethical piece of mathematics education research text can be offered to the reader in the spirit mentioned above: to alert, fascinate, astonish, inspire. That is, to orient the reader toward otherness, with a disposition to be welcoming and caring. This is what I mean by envisioning approaches to research that opens possibilities and creates conversations rather than attempts to provide answers and thus stop dialogues.

What might be less visible in these examples is how conducting classroom research can also become an opportunity to engage with teachers and students, and thereby embrace our ethical responsibility as researchers (Maheux & Roth, 2012). The strive toward objectivity at the heart of

universalist research endeavors does not sit well with how researchers always affect what they observe (again even in so-called hard sciences such as physics, see Heisenberg, 1958). What might it look like if researchers in mathematics education stop pretending to be flies on the wall or stop bringing students to their lab to study them without undesired influences? I would contend that various forms of research in which researchers become genuine participants in the situation they study can be consistent with Feyerabend's perspective. We might even call these "participating research" insisting that mathematics education researchers are here implicated in a school (as oppose to "participative research" where school members take part in a research project). Interesting examples of this can be found in the practice of cogenerative dialogue as a qualitative research method and ethics (e.g. Stith et al. 2006). In cogenerative dialogue research, various stakeholders (for example a teacher and a few students) repeatedly sit with a researcher to discuss everyday issues they are facing, to devise ways to go about it and to reflect on the process and its outcomes. The discourse around cogenerative dialogue is still often "research-based", and tend for example to conceptualize teachers and students as researchers instead of going the other way around, but this often takes place in contexts where the researcher and the teacher are the same person, and students also come to be called co-teachers (see for example Murphy & Scantlebury, 2010). This kind of approach could be a wonderful way to work "from the ground up" toward what Neyland (2004) calls the "re-enchantment of mathematics education" and a crucial step toward a "post-modern ethics of mathematics education" (p.60). Here, we can see mathematics education research as concretely opening possibilities and conversations in schools.

Aporia: A few words on a pressing issue

I mentioned how in his *Ethics as a measure of scientific truth* chapter Feyerabend (1999) writes about the Ceausescu regime in Romania. It is hard, in this year of 2022, not to make connections with the current Russian invasion of Ukraine. The topic of war and philosophy is very present in the last part of Feyerabend's book, and he criticizes philosophers for not taking a stronger stand in the socio-political arena and "issue a strongly worded condemnation of the crimes and the murders that occur in our midst, together with an appeal to all governments to interfere and stop the killing, by military if necessary" (p.272).

I have been for a few years an enthusiastic listener and occasional participant of the *Mathematics Education and Society* (MES) community in which mathematics education is being examined, discussed, and imagined through issues around cultural, gender-based, environmental, socioeconomic and other forms of iniquities or intolerance. I would like to briefly discuss here something that took place on the public mailing list of the group, which counts around 800 researchers and mathematics educators. It all started with one person posting on the list her concern regarding the Russian invasion of Ukraine, expressing solidarity and wondering how, as people involved in mathematics education, we might answer to this violence. A few people reacted to the post focusing mostly on the war without explicit connection with mathematics education. The moderator of the MES list then stepped in and called the discussion to a close:

The thread of discussion related to the grave events in the Ukraine is related to concerns I think most, if not all, of us share. It is not about Mathematics Education, not at the moment anyway, but it is about Society. I decided to let some of the discussion happen, but at some point I will invite people who want to continue the discussion to set up a separate medium for that.

A few hours later, he wrote again to provide a link to a “channel” that had been created on another platform to host and continue the discussion, but some members wanted to continue the discussion on the list, which lead one to write:

MES discussion list has a “moderator” who will decide whether this article [about the war in Ukraine] may be sent to all, so that each one can decide whether to read or delete it. [...] I cannot avoid relating the presence of a mediator, filtering out what can and cannot be said in the MES list, with the same fascist trend of western media.

This was received by the moderator as a no-confidence motion, and he wrote: “My actions as moderator of this listserv are being questioned [...] So until this is resolved I am going to approve every listserv message.” After that, unfiltered messages appeared, and soon enough people started asking to be removed from the list. These quickly piled up in my incoming mailbox, together with a number of emails from people sharing their opinion on the war, asking others to sign a petition or “protest against the aggression of NATO first!!!” and so on. Accusing the moderator of embodying a “fascist trend” also prompted a few visible reactions (“Sorry [...] it really was not my intention to getting you called fascist”, “You are doing a good job”) and some also protested against the removal of moderation and the list being taken over by discussions not clearly related to mathematics education:

I find it strange to question [the moderator’s] authority over the MES mailing list – a task he deals with in his private time. First, I do not have the impression that [the moderator] let through only Western-friendly positions. Second, the MES mailing list is for people interested in MES concerns. I do not know if discussing wars is in the middle of this. The discussion is also somewhat awkward, now that suddenly a war is happening in Europe, while other wars have been waging more or less undiscussed by us in the past years. Personally, I do not look forward to get 10 or 20 messages on the war over the MES mailing list every day and filtering out what is really about mathematics education. Thence the idea of creating an alternative place, which [the moderator] also took upon him to organise. So, I would be pro closing the MES mailing list for any further discussion of the topic. And: anyone is free to organise any other platform and share information on how to access the debate there.

This call did not stop the flow, nor the subscriber who challenged the moderation: on the contrary, he was still particularly active, vigorously arguing for his position on the war and what he saw as “fascist” tendencies to suppress his voice (claimed to be that of a minority). The moderator finally stepped in one last time. He shared the observation that within a few hours the MES list had lost about 3% of its subscribers (on a Sunday, while many people do not closely monitor their emails) and added: “I make a simple and clear request: I ask that we ALL stop posting to the listserv for 5 days” to “stop the bleeding”. After this message, the number of emails sent finally diminished, and eventually almost stopped (for a few days).

It might be interesting to contrast this with the seven rectangles episode from above. In the fragment, we see a teacher apparently wanting a classroom conversation to be about something specific. Something we can all “naturally” relate to mathematics. My personal guess is that Rachel was first very open about the observations student could make, for example focusing on patterns (the top side of the rectangles goes 1,2,3,4,5,7; the surface area of the rectangles increases, and so on) or relationships (width and length opposingly vary; the perimeter remains constant, the difference between the length sides of the sides diminishes, etc.). But in response to students

seemingly struggling to consider the series of rectangle as a whole, she decided to highlight one first, so student better grasp the sort of things she was interested in, hoping they could afterward offer new observation of their own. Asking the rhetoric question “did you use a different loop of string for each rectangle?” was just another way to say “lets think about how we all used a similar rope” while keeping her audience engaged in the way standup comedian often do. A device otherwise regularly used by teachers when they read stories to young students to help them follow and focused. Rachels interventions also clearly draw on the student recent experiences within the “community”, and keep on inviting different students to contribute asking the group “what else” could be said. And so even if these two minutes of teacher-led conversation might seem monological (Bakhtin, 1978) and strongly guided by the wish to make students see (and say) something very specific, a different interpretation is possible. We can rather see it as only a moment in a wider discussion in which it becomes dialogical as some to students are invited to respond to. It would be so if its volitional tone is geared toward *doing* mathematics, and aimed at supporting students to think mathematically about the rectangle. It is against this mesh of project and intention, in relation with what came before and what will come next, that the act gain its (ethical and mathematical) significance.

The emerging MES controversy is around the war in Ukraine is different in many ways. It is questioning what MES conversation should be about with elements that are specifically hard to connect with mathematics. It also seemed less about actually enabling people to engage by connecting with previous exchanges for example, or offering insights as to how observations about the were relevant to mathematics education (and vice versa). Questioning the relevance of the moderator created noise and community built around list started disintegrating. In that context where people calling names or pushing their opinions and others slamming the door, it would have been impossible to have a conversation. And things were evolving toward the complete destruction of this possibility. Feyerabend’s ethic is not about the anhelation of all structure and organization, it opposes the lack of diversity and the negation of actual human experiences and struggle. He mostly attacks domination structures, but not the notion of organization. The richness of being would not be possible without various forms of association and coordination. Even the famous slogan “anything goes” presupposes that “things are going”, and should actually all be considered. Being “against” something also means being *in contact* and *in contrast* with that something (repeatedly!), to be in opposition, to resist, which are all forms of relations. The richness of being is precisely in all those forms of organization. Moving toward celebrating this richness in mathematics education does not mean making research or conversation among researchers impossible... but quite the opposite!

Going back to the MES list, it was clear that one person in particular was very actively stirring the pot, and even after the call for a pause, he stayed active and argued for example:

We should not force people into discussions, but we should not expel people who want to discuss topics that concern minorities. *Minorities deserve respect.*

I was baffled by his deafness to the arguments and the way in which despite his apparent best intentions he was (in my view) quite insulting. Was it accidentally or expertly done? Was he not somehow enacting more than anyone else what I would have described as “fascist” behavior, intolerant and oppressive in his way of communicating³ ?

I would never say that someone is or is not a fascist or is or is not this and that. Only one’s specific actions and sayings can undergo this sort of judgement. I am not accusing anyone; I

³ Others also commented saying for example “I do not think one person’s opinion should dominate like this.”

am questioning the existence of a moderator for the discussion list of a society that was born under the principles of MES. I am arguing that this very existence and its inherent restriction of discussion [...] relates to the one-sided view of Western media that I classify as a fascist trend.

I decided to write directly to that person, and we had an interesting, rather lengthy “private” conversation⁴ about his perspective on the war, and why he was acting on the list in this way. In a nutshell, I concluded that he really believes fascist ideology is (unknowingly to most) often behind the way the medias present sociopolitical issues, and that this framing shapes many people’s understandings. He also truly thinks that Russia is not to blame in the Ukrainian conflict because they are battling against fascism, which he defines as “the endeavor to obliterate, in the level of discourse, all possibilities of taking sides with the workers against capital”. The connection with mathematics education was there for him, although relatively general in my view. He was convinced that this “fascist trend” is also present in the fact that the MES list is moderated⁵, and notes:

Surprisingly, one of the founders of MES declared that he would delete messages that were not about mathematics in some way. I wonder if he would delete this message: due to their ownership of a special qualified labor power, mathematicians tend to obliterate debate about [how much of his total labor is the worker willing to relinquish to keep the capitalist’s ownership of the means of production].

The problem for me here is not so much the almost explicit idea that some dark entities are secretly manipulating us, but obstinate refusal of a true dialogue. Days after days, the news were covered with the atrocities and pitiful discourse of the Russian politicians. But just like no evidence whatsoever seems to be able to change a flat-earth’s mind, he could not find enough value in my arguments about the importance of maintaining the list and avoiding the risk of destroying it over this issue. He was sensitive I think to my interpretation of the way he phrases his critique, but unconvinced by the core of my argument, based on Nancy’s (1991) notion of inoperative community and the importance of dialogue and dissensus. I tried to explain that what is most important is to keep people going: “What matters is not the mixture, it is the mixing. The confused fight, the scuffle. The mingling, the blending. All very active, flowing, uncertain, undetermined and elusive but immediate and palpable actions”. To “submerge [people] with messages” in the way he wanted would go against this. Continuously offering the same deaf and monologic discourse as he did is another way to go against (the) community. Arguing that a group of people is intentionally manipulating us is also very different from an analysis in terms of forces and ways of thinking unknowingly present in what we do. Heidegger critiques modern thinking and Feyerabend presents and argument against the ways of science, not a specific group of people. Even his reaction to the Chinese astrophysicist in his *Ethics as a measure of scientific truth* chapter is not a mere condemnation of the individual, but a response, a turn in conversation aimed at sustaining dialogue on the issue. This incident on the MES mailing list occurred in March 2022, around the time Sergueï Lavrov attempted to justify the invasion at the UN council, leading representatives of many countries to leave the room. Refusing to hear what Lavrov had to say was a meaningful move because dialogue

⁴ I later found out he posted his answer to me in the in the parallel space created to host the discussion.

⁵ Because “to rely on a ‘moderator’ to filter content of messages is already a fascist practice, because it leaves open, (should I repeat?) leaves open the possibility of averting the [question of the capitalist’s ownership of the means of production].” And also: “this (moderated) list manages move forward fascist agenda (by tapping on people unwillingness to be submerged by messages and opinions on a specific topic)”

is not merely about allowing everyone to talk and say whatever they want, but open participation in trying to make sense of the world around us.

Here again, contrast this the classroom fragment I discussed above might highlight some interesting elements. Creating spaces for mathematical talk is not necessarily easy. It requires time, efforts, sacrifices, dedication, and so on. Not so long ago, it would have been impossible to imagine a group of children (from “ordinary working families”) studying together rectangles made of strings, trying to figure “what was the same about all these rectangles”. We all know this did not become possible (and relatively widespread) simply out of natural order or undebated logic: we still hear today strong opponent to “students centered” (mathematics) education. We also know how our schooling system in large parts derives from the expansion of the factory model during the industrial revolution, and the desire to “free” workers from the care of their children so they could work more. We can also easily contrast the kind of life we choose for ourselves and our children with what we call “traditional” ways of living, where children grow and learn through what Lave and Wenger (1998) called legitimate peripheral participation in regular activities. Celebrating the richness of being is about considering *and* questioning all these ways of living starting with those that “dominates” us because we born from it. Most mathematics educators and mathematics education researchers come from the schooling system in which they inscribe their work (or a similar one). And just a fish hardly sees the constraints and opportunities of living in the water, it can be hard for us to step back from a surrounding discourse such as the one of science, or the notion of scientifically manage mathematics classroom.

Feyerabend’s ethics is not about silencing the voice of science. What he wants is to alert us to the danger of listening too much to it, unaware of its hegemonic tendencies. The answer to that is of course not to push in its place another, perhaps even more hegemonic discourse such as the one of creationism or Stalinism. It is rather in the welcoming of uncertainty, ambiguity, dissensus, and curiosity for the other, for other ways of doing, of being. Mathematics education research also has the possibility to strive for such an ideal. In this chapter, I have focused on research and avoided saying too much about what a more ethical mathematics education could look like. Pointing to only one example, I have examined elsewhere how curriculum design in mathematics education can be reconceptualized and carried on in the spirit of Levinas’ ethics, as an opportunity to encounter the Other (Maheux, Swanson & Khan, 2012). There is of course much more to discuss on these topics, and Feyerabend’s provocative proposition regarding the teaching of science in school (for example in *Against method*) is sure to set the cat among the pigeons. I can only suggest looking into it, for I am sure that it can spark conversations. Something other chapters in this book are also doing.

References

- Arvisais, O., Bruyère, M. H., Chamsine, C., & Mahhou, M. A. (2021). The educational intentions of the Islamic State through its textbooks. *International Journal of Educational Development*, 87.
- Bakhtin, M. (1978).
- Bourdieu, P. (1999). *The Weight of the World*. Polity Press.
- Bourdieu, P., & Wacquant, L. J. (1992). *An invitation to reflexive sociology*. Chicago: University of Chicago press.
- D'Ambrosio, U. (1998). Mathematics and peace: our responsibilities. *ZDM*, 30(3), 67–73.
- D'Ambrosio, U. (2007). The role of mathematics in educational systems. *ZDM*, 39, 173–181.
- Fernández-Giménez, M. E., Jennings, L. B., & Wilmer, H. (2019). Poetic inquiry as a research and engagement method in natural resource science. *Society & Natural Resources*, 32(10), 1080-1091.
- Feyerabend, P. (1975). Imre Lakatos. *The British Journal for the Philosophy of Science*, 26(1), 1-18
- Feyerabend, P. (1993). *Against method*. Verso.
- Feyerabend, P. (1999). *Conquest of abundance: a tale of abstraction versus the richness of being*. University of Chicago Press.
- Giroux, H. A. (2018). *American nightmare: Facing the challenge of fascism*. City Lights Books.
- Hansson, L. (2018). Science education, indoctrination, and the hidden curriculum. In *History, philosophy and science teaching* (pp. 283-306). Springer, Cham.
- Heidegger, M. (1954). *The question concerning technology and other essays*. Harper.
- Heisenberg, W. (1958). *Physics and philosophy: The revolution in modern science*. Harper.
- Huxley, A. (1932). *A brave new world*. Chatto & Windus.
- Lave and Wenger (1998). *Situated Cognition*.
- Levinas, E. (1981). *Otherwise than being or beyond essence*. Springer Science & Business Media.
- Luitel, B.C. (2012). A multi-paradigmatic approach to researching lived experiences in Mathematics education: contemplating possible connections. *International STEM Research Symposium WISDOMe Monograph #3*, 101-113
- Maheux, J.F. (2010). Compliance or Complicity? *Complexity and Education*, 7 (1), p.88-97.
- Maheux, J.F. (2017). Proulx on Hattie: Epistemological read on a pedagogical quest. *Chroniques*. Online at: <https://www.chroniques.uqam.ca>
- Maheux, J.F. & Roth, W.M. (2012). The Ethical Significance of (Mathematically) Engaging with Students and Teachers while Collecting Qualitative Data. *Forum: Qualitative Social Research*, 13(3), Art. 11.
- Maheux, J.F., Swanson, D. & Khan, S. (2012). From Text to Pretext: An Ethical Turn in Curriculum Work. In T. Mason & R.J. Helfenbein (Eds.), *Ethics and International Curriculum Work: The Challenges of Culture and Context* (pp. 143–171). Information Age Publishing.
- Maturana, H. R., & Varela, F. J. (1998). *The tree of knowledge*. Boston & London: Shambhala.
- Murphy, C., Scantlebury, K. (eds) (2010). *Coteaching in International Contexts*. Springer, Dordrecht.
- Nancy, J. L. (1991). *The inoperative community*. University of Minnesota Press.
- Neyland, J. (2001). *An ethical critique of technocratic mathematics education: towards an ethical philosophy of mathematics education*. Wellington: Victoria University, Unpublished PhD Thesis.
- Neyland, J. (2004). Toward a postmodern ethics of mathematics education. In Walshaw, M. (Ed.) *Mathematics education within the postmodern* (pp. 55-73). Information Age Publishing.
- Neyland, J. (2005). Towards an ethically oriented curriculum: Resisting the growth of instrumentalism. *Curriculum Matters*, 1, 109-130.

- Neyland, J. (2007). Globalisation, ethics and mathematics education. In B. Atweh et al. (eds.), *Internationalisation and Globalisation in Mathematics and Science Education*, pp. 113–128. Springer.
- Proulx, J. (2015a). Going beyond validity criteria in mathematics education research: towards the generativity of a research study. *Chroniques – fondements et épistémologie de l'activité mathématique*. Online at: <http://chroniques.uqam.ca>
- Proulx, J. (2015b). Mathematics education research as study. *For the Learning of Mathematics*, 35(3), 25–27.
- Ricoeur, P. (1994). *Oneself as another*. University of Chicago Press.
- Robinson, K. (2001). *Out of Our Minds: Learning to be Creative*. Wiley-Capstone.
- Stith, I., Scantlebury, K., LaVan, S.-K., Emdin, C., Lehner, E., & Kim, M. (2006). The Ethics of Cogenerative Dialogue: A Cogenerative Dialogue. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*, 7(2). <https://doi.org/10.17169/fqs-7.2.128>
- Tenove, C. (2020). Protecting democracy from disinformation: Normative threats and policy responses. *The International Journal of Press/Politics*, 25(3), 517-537.
- Valero, P. (2004). Postmodernism as an attitude of critique to dominant mathematics education research. In M. Walshaw (Ed.), *Mathematics education within the postmodern* (pp. 35-54). Information Age Publishing.
- Varela, F.J. (1999). *Ethical know-how: Action, wisdom, and cognition*. Stanford University Press.