

What are the ‘orderings’ of mathematics education research? How might we need to contain/constrain them in arguing for a mathematics education for solidarity and hope?

Hilary Povey

Sheffield Hallam University

Given the current socio-political-ecological context, I am concerned to problematise how (mathematics) education research is ‘ordered’ – what taken-for-granted and mostly unnoticed assumptions underpin our practices, the language we use, the artefacts we employ, the textual conventions we are required to adopt, the generally hidden practices of reviewing and how the products of research are and should be valued – what ‘counts’. I discuss why these ‘orderings’ matter and why we should all be concerned to work for a mathematics education for solidarity and hope, whatever our field. Throughout, I ask questions rather than suggest answers, and I argue that this continuous interrogation of the self and the community is a necessary practice.

Keywords: research practices; ‘ordering’; critique

Introduction

I begin this contribution, based on the Day Conference plenary, with some introductory remarks about the socio-political-ecological context within which we find ourselves. I will suggest this context requires us to consider if and how our own taken-for-granted practices, our ‘common sense’ in mathematics education research, might be eliminating the challenge to this *status quo*. And to ask if we need to rethink our ways of being in the world as mathematics educator researchers. How, if at all, do we need to change our ways of thinking, questioning, exploring, hoping, pondering, publishing and so on (Applebaum, 2017)? I then consider some of the ways (mathematics) education research is ‘ordered’ (Straehler-Pohl, Bohlmann & Pais, 2017):

- by taken-for-granted concepts
- with respect to value positions
- by instructions for text construction
- by the mechanics of text submission
- by the hidden processes of reviewing.

I will focus in particular on our own journal, *Research in Mathematics Education* (RME). Throughout, my intention is to raise questions rather than to answer them.

The current socio-political-ecological context

We live in a globalised era of, not least, ecological crisis; war and huge rearmament programmes across the United States and much of Europe accompanied by vast amounts spent on mathematically based arms research and huge profits for arms manufacturers; increasing inequality; enforced mobility across borders accompanied by pervasive colonialist and racist assumptions and practices; expanded powers of the

police and other law enforcement agencies and the military with an erosion of accountability; a breakdown of respect for international law and the apparent collapse of the world order since the Second World War.

The need to challenge taken-for-granted ‘orderings’

In such a context, no received wisdom should go unchallenged. We should call everything into question and interrogate if and how it contributes to maintaining or challenging the *status quo*.

‘Common-sense’ gains its orthodoxy through discourses of the powerful (Foucault, 1979; Gramsci, 1971), which are neither innocent nor value-free. They conceal their own invention, constraining what it is possible to say and to think: things are as they are and cannot be thought of as being otherwise. And, as soon as any field of critique emerges, initially contested but then becoming established, a process of colonisation occurs, and we become complicit in the new ‘ordering’ (Povey & Adams, 2021). We cannot avoid such entanglements. But we can attempt to draw attention to the complexities and contradictions inherent in this instance of writing articles acceptable for academic publishing, whilst arguing for challenging how things are.

Of course, much will escape our scrutiny, and much that we do see will be found valuable, worthwhile, and worth keeping. My intention is simply to keep asking ourselves questions. I suggest a need to be both ‘in and against’ the world of mathematics education research if we want a fairer, more just, ecologically sustainable and more loving world. “If we don’t push back, we will be pushed over” (London Edinburgh Weekend Return Group, 2021, n.p.).

To illustrate my thinking, I sometimes draw on the RME paper that Gill Adams and I wrote together (Povey & Adams, 2021). The catalyst for this was the moral and political difficulties and dilemmas raised by participation in an EU-funded project, *Project in Citizenship and Mathematics* (www.citizenship-and-mathematics.eu). Striving for a radical and emancipatory approach throughout, we found ourselves constantly enmeshed in a struggle to resist neo-liberal ‘orderings’ of being part of such a project and the accompanying research.

The ‘ordering’ of taken-for-granted concepts

Two key concepts at the heart of the project were *mathematics* and *citizenship*, which, in most mathematics education contexts, are unquestionable ‘goods’. As an example of how the taken-for-granted needs to be noticed and challenged, I seek to problematise these concepts.

Very briefly, *citizenship*. Citizenship is usually taken as a concept whose meaning is transparent, with rights and duties which are associated with equality and fairness. But what consensus is there about what it means? Who gets to be a citizen? And who has it taken away? How is this affected by the colour of your skin, your gender, your economic status, or your religious affiliation – think Palestinian Israeli or Muslim Indian citizens? And, in England, in 2026, are any constitutional rights guaranteed to any of us?

But much more central to our concerns is *mathematics*. We know mathematics does significant harm in the world. Two examples. Through the use of computer software, highly sophisticated weaponry is deployed by the rich against the poor, unmanned combat aerial vehicles against slingshots. Horrors only continue to increase. Drones programmed in all sorts of nightmare-ish ways. Or the use of

mathematical algorithms within predictive policing, now to be routinely accompanied by face recognition software, creates self-reinforcing feed-back loops likely to support, for example, anti-black and anti-Muslim injustice, violence and oppression. And then there's the role of mathematics in 'progress' (Povey & Angier, 2021), where this is understood as the exploitation of the earth to generate the never-ending accumulation of capital, with the world's interconnected ecosystems being under huge threat, disproportionately affecting the global South.

And mathematics is also implicated in ordering and ranking young people in schools, leading to the justification and legitimization of social stratifications. Complex statistical measures based on mathematically analysed tests and demographic data lead to learners becoming dehumanised, a cell on a spreadsheet coloured red, amber or green or a labelled co-ordinate on a two-way grid (ibid.).

Mathematics currently acts as a powerful political tool supporting governing elites, formatting how we understand the social world and therefore our place in it (Skovsmose, 1994). Mathematical thinking with its apparent certainties and neutrality easily provides "a training in ethics-free thought" (Ernest, 2016, p.14).

But taken-for-granted concepts can change or be replaced. For example, we no longer use the inherently masculine concept of 'mankind' to represent humanity. We no longer refer to people as male unless they identify as such. This change has come about due to decades of contestation around language. and, of course, continues. I suggest we need to be continually on the lookout for other concepts that require similar interrogation, acknowledgement, change, or replacement.

In writing for publication, should we all have to consider whether or not our key concepts are contestable?

The 'ordering' with respect to value positions

As researchers and authors, whether we like it or not, any text we produce, or research we undertake, is necessarily embedded in a value position. In the article Gill and I wrote, we made explicit the values underpinning the text: for example, developing more human and more humane interconnections with others; fostering a radical, active hopefulness; using mathematics to help us experience delight and joy in mystery in the world (Vlieghe & Zamojski, 2019); and using mathematics to critique and change the world with solidarity in the here and now to enable just practices and transformational action by young people to build a better world. But, I suggest, this is not typical and, for example, improving the teaching of addition of fractions to 12-year-olds needs no such statement; it is a necessary 'good'. Is it?

Should all the texts we produce require us to acknowledge our values?

A further set of 'orderings' relates to the production of research text. What is recognised, measured, valued and rewarded currently in research in the UK, indeed, I suggest what 'counts' as research at all, is the production of peer-reviewed text. These include the requirements for how it is constructed, the mechanics of how it is submitted and the ultimate invisibility of the review process when it is published. In the next three sections, I briefly consider these using our own journal, RME, and the article previously mentioned as context.

The ‘ordering’ of instructions for text construction

In articulating its aims and scope, RME ends with “[the journal] is open to innovative and unusual approaches” ([Learn about Research in Mathematics Education](#)). But the instructions for submission are narrow and formulaic: “[submissions] should be written with the following elements in the following order: title page; abstract; keywords; main text introduction, materials and methods, results, discussion; [and other end matter]” ([Submit to Research in Mathematics Education](#)). Of course, this structure is one effective way to construct a paper and may be useful as a starting point (though we might want to ask whether anything is missing, for example, a statement and a brief defence of the values underpinning the research).

But is it really the only one?

Another ‘ordering’ of text construction comes later in the review process. Sometimes, whether or not this reflects one’s methodological approach, it is required that one includes the research questions that the text addresses. But perhaps the research is about an initial enquiry related to an area to be problematised, explored and interrogated and not intended to offer specific answers to a set of questions.

Is this not research? What about ethnographic and anthropological approaches?

The ‘ordering’ of the production of text requires us to give titles to any tables, figures, images and so on and to incorporate and reference them in the text. But, in the case of the RME article mentioned above, we wanted to interrupt the text with images accompanied by quotations without comment in a process reminiscent of montage. Montage makes the author's role more explicit and is a form of representation that defies more traditional forms of research texts and helps underscore its manufacture (Swanson, 2018). These ‘invasions’ can highlight our textual performance in an attempt to interrupt the reader along the journey of reading the text, to try to unsettle its consumption.

The reviewers and editors alike wanted us to explain and justify what we were doing, an entirely reasonable request. But then, how could our attempts to unsettle the reader be effective? Now they would be expected and thus assimilated with comparative ease. One of our reviewers offered that “making someone write their own justification/critique is a practice associated with repression...all too often it is only the norm that does not have to justify itself”.

Is there an only or best way to present a research paper? How, if at all, does the given one constrict/constrain?

The ‘ordering’ of the mechanics of text submission

Academic life, like all ways-of-being, is deeply embedded in and framed and understood by artefacts whose very familiarity makes them invisible, thus imbuing them with great power. In the case of RME, a constraining, unremarked, unconsidered and unacknowledged artefact of academic life is the article submission software, ScholarOne, which makes strict textual and formatting demands. These prohibited us, in the previously mentioned article, from submitting the text with our interruptions in place. Fortunately, our two very helpful and supportive reviewers were aware of this

and expressed some concern that this prevented them from being able to provide effective feedback on the extent to which our device worked or didn't work to unsettle the reader.

Should we be worried about the software having this power?

Generative AI is, quote, “a technology that is changing faster than we can imagine under the less-than-careful eye of some of the most morally compromised and richest people on the planet” (Middleton, Shaw, & Gauntlett, 2026, p.11). ScholarOne, owned by one global corporation after another, is committed to the use of artificial intelligence to provide improved paper screening by pre-evaluating the content of papers before academic review ([ScholarOne Manuscripts - Silverchair](#)).

Do we all know this? Does it concern us? Should we trust it? Should we be worried about the extent to which technology is controlling academic practices with respect to text production?

The ‘ordering’ of the hidden processes of reviewing

The manufacture of an academic text involves a (power-drenched) dialogue between, usually, editors, reviewers and authors; but this dialogue, even when its existence is acknowledged, remains almost invisible to the reader, its consumer. The sometimes messy processes and human relationships behind it are hidden from view. Despite this erasure, the dialogue plays a significant role in creating and disciplining the texts that form the commodities of the research industry. This silence is an aspect of the ‘ordering’ of mathematics education research.

To make the consumption of the research text more self-conscious for the reader, and to push back a little on the taken-for-granted process of research production, in the previously mentioned article, we disclosed as transparently as we could some of what had happened behind the scenes. We asked the reader to bring this to mind by sharing some of those conversations, deliberations and responses. What we were able to do was very limited ‘disorder’ but, at least, we felt, it was something.

Does it matter that the role of the reviewer in shaping the text is almost always hidden from view? Is there any realistic alternative?

Mathematics education research for solidarity and hope

Before concluding, a word about my values and about a mathematics, a mathematics education and a mathematics education research for solidarity and hope. I believe:

- we need mathematics as part of a critique of contemporary political arrangements (precisely because of its formatting power) as we try to care for one another and our world
- the young need mathematics in shaping policies which bring greater fairness to people and the planet; and
- we need a mathematics education that can contribute to an understanding of the world as a mysterious and beautiful place (Vlieghe & Zamojski, 2019) and an awareness that it can delight us and allow our creativity to flourish.

Mathematics education research has a part to play in helping us understand better what this might be like and how it might be achieved (Povey & Angier, 2021).

Any thoughts about how we might reconsider our artefacts and practices will necessarily be uncertain and lack resolution: critical knowledge is persistently open, disclosive, incomplete and open-ended and, quote, “this uncertainty and indeterminacy extends beyond knowledge alone to include the foundations for political actions” (Skovsmose, 2016). The role of (unanswered) questions remains a key part of this process.

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References

- Applebaum, P. (2017). Disordered order, ordered disorder: threads, folds, and artistic action. In H. Straehler-Pohl, N. Bohlmann, & A. Pais (Eds.), *The Disorder of Mathematics Education: Challenging the sociopolitical dimensions of research*, (273-290), Springer.
- Ernest, P. (2016). The collateral damage of learning mathematics. *Philosophy of Mathematics Education Journal*, 31, November, 2016. [online].
- Foucault, M. (1979). *Discipline and punish: The birth of the prison*. Penguin.
- Gramsci, A. (1971). *Selections from the Prison Notebooks of Antonio Gramsci*. Q. Hoare, & G. Nowell-Smith (Eds. and trans.). International Publishers. London
- Edinburgh Weekend Return Group. (2010). *In and against the state*. <https://libcom.org/library/against-state-1979>
- Middleton, R., Shaw, L., & Gauntlett, M. (2026). What does generative AI mean for science? *Morning Star*, February 25, 2026.
- Povey, H., & Adams, G. (2021). Disordering mathematics, citizenship and socio-political research in mathematics education amongst the “rubble of words”. *Research in Mathematics Education*, 323(3), 306-322.
- Povey, H., & Angier, C. (2021). Against ‘progress’, FORUM, 63(2), 20-31.
- Straehler-Pohl, H., Bohlmann, N., & Pais, A. (2017). *The disorder of mathematics education: Challenging the sociopolitical dimensions of research*. Springer.
- Vlieghe, J., & Zamojski, P. (2019). Out of love for some-thing: An ontological exploration of the roots of teaching with Arendt, Badiou and Scheler. *Journal of Philosophy of Education*, 53(3), 518-530.
- Skovsmose, O. (1994). *Towards a philosophy of critical mathematics education*. Kluwer Academic Publishers.
- Skovsmose, O. (2016). Politics of meaning in mathematics education. *Philosophy of Mathematics Education Journal*, 31, November, 2016. [online].
- Swanson, D. (2018). Vernacular: A montage of mathematical graffiti, quotations and commentary. *The Mathematics Enthusiast*, 15(1/2), 133–147.