IN THE TEACHING OF MATHEMATICS PART OF ETHICAL RESPONSIBILITY IS TOWARD A SHARED SENSE OF SOLIDARITY AND COMMITMENT

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ABSTRACT

Before long, we will be handing over today's uncertain world to our students. Whose responsibility is it to help them make sense of this world? Whose responsibility is it to show them that each of them has the power to care, to recognize injustice, to unite, and to believe that a committed group can create change? Gutstein et al state: "Each of us has a responsibility to both think about and act on issues of equity." (2005, p. 98). This raises some questions: Responsibility towards whom? Towards the learners of mathematics? Our fellow mathematics educators? Society at large? The planet? These questions are important because, for the most part, the teaching of mathematics and its content as articulated at least in Norway and Canada curricula, is remaining ignorance to the happenings of the world. I suggest that, in choosing what to teach (and what to omit) in mathematics classrooms, part of the responsibility is towards a shared inner sense of unity and solidarity. In this brief text, I will explain this perspective, drawing on the ideas of Rumi and Arendt.

Keywords

Solidarity, Commitment, Ethics, responsibility, mathematics.

Pre-context

Persians have inherited more than 2,000 years of written philosophy, literature, and meaning-making traditions. Just by mere accident of where I was born, I became an inheritance. What I have inherited shapes my thinking, my way of being, and my relationship with the world around me. Within my own limits, I see the world of education and the place of mathematics in it, through the lens of my Persian ancient legacy. Recently, I wondered how 12 years of education through similar school subjects can produce figures like Elon Musk, Diddy, and Donald Trump, while also shaping individuals like Ruth Bader Ginsburg, Frantz Fanon, and Rosa Parks. Does explicit reflecting on human rights values—such as dignity and ethics— in schools influence these different paths? As teachers of mathematics, do we need to worry about the kind of mathematics that we teach? How do we know what our students' needs are, given that they are exposed to contents of all kinds, daily? What do we owe to our students?

Context

Mathematics education has research that sees no need to integrate social and political issues into the teaching and learning of mathematics and research that cannot imagine excluding

them. Although I understand the first perspective, I align with the second. I give an example to show the extent of my commitment to the second strand. Norway, in its new national curriculum (Udir, 2020) added 5 core values: Human dignity; identity and cultural diversity; critical thinking and ethical awareness; the joy of creating, engagement and the urge to explore; respect for nature and environmental awareness; and democracy and participation. The curriculum states that these values must be included in all school subjects (e.g., sciences, history, geography, language, mathematics and so on). Although more progressive than many other curricula, Norway's national curriculum still maintains well-defined school subjects (e.g., science, history, geography, mathematics, and so on). Students attend school to study these subjects within specific time slots and are tested on their proficiency. Meanwhile, values remain secondary to academic subjects. I like to be as radical as reversing the place of values and school subjects. That is, if school subjects were values such as ethics, human rights, ecological justice, democracy, and sustainability, while disciplines like science, history, geography, and mathematics were taught in relation to these values. Would this kind of education foster different kind of thinkers and leaders? Of course, from one end to the other, there is a spectrum of beliefs; from primarily teaching mathematics, to different degrees of integration of values, to primarily teaching the values and including mathematics as one sees fit in better reflecting on and acting upon the values. With what considerations would I choose where in this spectrum I wish to stand? What are the entities I am responsible towards? The curriculum, the government policy documents? My students? Myself?

In this paper, I build on the previous conceptualization to revisit ethical responsibility. I argue that in the teaching of mathematics one part of the responsibility is toward the shared inner sense of solidarity and commitment both for the teachers and for the students. To argue for this, I build on Rumi and Arendt. My guiding questions are:

1) Why and how in choosing what to teach (and what to omit) in mathematics classrooms, could part of the ethical responsibility be towards a shared inner sense of unity and solidarity?
2) How reversing the place of values (the ones noted in the Norway Curriculum for example) and the school subjects (including mathematics) could contribute to upholding this ethical responsibility?

The (added) responsibility

In day-to-day practices, teachers of mathematics face immense number of responsibilities. We are responsible for following mandates from the curriculum, for the demands of government authorities in terms of what mathematical concepts to teach, at which grade level, when during the school day, and so on, and, at times, for supporting parents and addressing their needs. Alongside these duties, some teachers courageously take on additional ethical responsibilities, for example, integrating social, ecological, and political discussions into their classrooms while still fulfilling their obligation to teach mathematics. With what considerations do teachers assume these added ethical responsibilities?

In our field, we have long moved from an egoistic, individualistic *I* toward an understanding rooted in the ethics of the *I-Other* relationship—a shift that many researchers have explored. *In the I-Other relationship*, the 'I' and the 'Other' assume different entities. For example, the

I could be a teacher or a researcher. The Other could be the community of mathematics education researchers, or the teachers of mathematics, or the students. In the following, I give examples. In their commentary, Aguirre et al (2017) explore the responsibility of mathematics education research community. They discussed various political actions to ethically advance intentional collective responsibility —to do the right thing for current and future generations "start now, collectively, and use our power toward a more humane, just, and equitable mathematics education" (p. 125). Skovsmose (2007) also speaks to ethical responsibilities of the mathematics education research community. He explains that it is the ethical responsibility of the community of mathematics education research to address the uncertainties, for instance with respect to how mathematics education might involve discrimination or empowerment, inclusion or exclusion, and in this way address the sociopolitical dimension of mathematics education. For both Aguirre et al (2017) and Skovsmose (2007) the entity that is 'responsible' is the individuals who collectively construct the mathematics education research community. Although Skovsmose (2007) does not explicitly mention, Aguirre et al (2017) regard the 'Other'—to whom we bear ethical responsibility—as 'current and future generations'.

Appelbaum (2007) believes that teaching is an ethical stance founded on the direct, face-to-face ethical encounter of responsibility between persons. With such an understanding, he argues the ethical responsibility of the teacher educators is to, for example, encourage K-12 teachers to infuse socially just curriculum, to resist the perspective that schools and teachers are apolitical, or to be conscious of their beliefs and values so that they begin to see ethical responsibility of teaching. Similarly, Atweh (2007) focuses on the ethical responsibility in the teacher-student pedagogical encounter. In this sense, he explains that ethics "invites us, rather compels us, to a continues and exhaustive sense of engagement with the welfare of the other" (p. 339). Both Appelbaum (2007) and Atweh (2007) identify mathematics teachers, whether in schools or in teacher education programs, as the entities bearing responsibility. Appelbaum (2007) views the 'Other'—to whom we hold ethical responsibility—as preservice teachers, while Atweh (2007) extends this responsibility to the welfare of 'the other'. These are some of the examples of the ethical relationship between I and the other.

I build on this establishment to extend the 'Other' to also include our sense of collective solidarity and shared commitment. Shared commitment to other humans, trees, glaciers, sea lions, and the layer of ozone. In the following, I explore these ideas through two historical stories from Rumi and Arendt.

A shared sense of solidarity – An inward journey

My presupposition in exploring the ethical relationship is stemmed from my growing up in the thoughts of Rumi (my root) and my reading of Hannah Arendt (one of my branches). Although, none of these two philosophers have explored the ethical responsibility towards a shared sense of solidarity in the manner I propose, my thoughts are nonetheless grounded in their combined ideas. The philosophical ideas of Rumi and theoretical ideas of Arendt are both the products of their time, space and life conditions. So to avoid abstractions and generalization, I first tell about their context.

Rumi's thoughts - The context in which a conceptualization of "I (self)" was born

Rumi is a 13th-century Persian philosopher, scholar and poet born in the 1207. He lived most of his life in exile and in travelling, meeting elders of many cultures and rituals. He has written over 70,000 verses, exploring inner growth, the spirit and sense of share commitment. Rumi fundamentally believed in the abolishment of fear-based religions. Through his experience, he becomes one of the boldest of believers in the oneness of the 'Eshgh (love)'; a quality that transcend all divisions. Eshgh, a power in every human, is the root of communal relationships leading to a sense of solidarity, belonging together, and shared responsibility.

For English thinkers, the word 'Eshgh', could be translated as Love – but it is well beyond just a romantic love. The closest translation for the act of Eshgh could the underlying emotion that surfaces as 'been moved'. That means being touched or affected by an event, story, or situation. The sense of Eshgh transforms the mere sense of 'being moved' to 'be willing to do something' about the event, story, or situation. Rumi compares the giving-ness of the Eshgh to that of the Sun; an unwavering force that gives without discrimination; radiating regardless of who or what it touches. Rumi says Eshgh: "is a sun within every person". It is the sense of Eshsgh – residing in every human – that deepens our sense of oneness and solidarity, which in turn creates devotion, commitment, and shared responsibility that is necessary for union amongst, all the members of the earth. Because the ideas of Rumi might not be known to English (Western) speaking people, I need to re-emphasize that Eshgh is not a human centric sense. Eshgh is solidarity with everything we share the earth with – mountains, rivers, spirits of the past and more. My emphasis here is also a strong opposition to De Freitas (2025) presentation in ICMI 27, stating: "Over twenty years ago, the philosopher of science Donna Haraway coined the term "nature culture" to describe how nature and culture are never mutually exclusive or ontologically Separable" (P. 15). The presentation viewed a 'none-human centric' view of the world as a new discovery of West; to which the least of my concern is the disrespect for non-Western's knowledges and thousands of years of being.

Now to show Eshgh in action, I give different examples at different levels, and highlight what makes them different. All of us, when we see a hungry child in our classroom, we try to find them food. Most of us, when we hear a hard condition of a child or their mother, at home, we are willing to stand up for them, to the school leaders. Some of us, when we see the atrocity of the horrid military actions in the world, we feel we need to talk about it in our mathematics classrooms. What makes the actions of different people differently in these examples, is the element of self-reflection. Rumi says the sense of Eshgh (inner solidarity and commitment) becomes stronger by going back to self; by constant self-reflection. He invites us to 'Look' and 'Search' not in the outside, but in the inside. He says: to find Eshgh, "look inside yourself; everything that are looking for, you already are".

From Rumi I learnt that the growth in Eshgh – growth towards a sense of shared solidarity and commitment is an inward journey. At the core of this inward journey are constant pauses. Pauses to re-assess experiences, choices, and responses. Going back to my guiding question, I suggest the possibility that in making the decisions in mathematics classrooms – in terms of what to teach or not teach – part of our responsibility is towards that shared sense of 'Eshgh' - of the inner sense of solidarity and commitment both of my students and myself. That is to

pause for self-reflection towards the growth of shared sense solidarity and commitment, the senses that we all possess and do belong to.

How optional is this inward journey?

As I mentioned above, Rumi rejects fear-based ideas. In my limited knowledge of his philosophy, I could not find his articulations of the consequences of the lack of constant self-reflection. To highlight the life-changing importance of self-reflection, I use another profound story. It might seem bizarre, but this story is stemmed from the controversial coverage of the trial of Eichmann, an officer of Schutzstaffel in WWII, by Hannah Arendt. I understand that Europe sees WWII as one of the most horrid events (on earth). Through the eyes of Europe, the fact that no other event is/was as bad as WWII, is understandable because this war was the closet to home. To the rest of the world, similar or worse horrid event have happened before WWII and are happening now. I have a rationale for choosing Arendt's reflection on the Eichmann trial. I do so because I want to make the strongest possible contrast with the current world, so that similarities and differences, in ethical responsibilities, become most visible. So that we could connect the past learnings of the (lack of) self-reflection to our own experiences, now.

During World War II, Hannah Arendt, a Jewish philosopher, fled Europe for America. Years later, driven by a deep sense of responsibility, she volunteered to cover the trial of Adolf Eichmann as a reporter for The New Yorker. From her observations, Arendt set to understand what was unprecedented in the Nazi genocide, not to establish an exceptional case for Israel, but to understand a crime against humanity. Crime against gypsies, gays, Jews, communists, the disabled and the ill. Her coverage was controversial as it caused outrage in the Jewish communities. Firstly because of the argument that the Eichmann trial should have been reported as beyond a crime against humanity, instead it was a crime against Jews. And secondly the outrage that she referred to Eichmann's monstrous actions as 'banal. It is through the concept of banality that Arendt underlies conditions that either prevent or enable us to commit different acts (in line with or against solidarity and commitment). Let me explain.

In her report of the trial, Arendt portrayed Eichmann an ordinary bureaucrat. She explained that Eichmann was not a monster, instead, he was terrifyingly normal. Normal but 'thoughtlessness'. Eichmann lacked the ability to think for himself. Arendt called the crime "banal", to show how bad actions can become accepted, routinised, and implemented without revulsion or resistance. I need to mention that, personally, I do have difficulties accepting the extent of Arendt's view that Eichmann was very normal only very thoughtless. I seem to be more comfortable believing that Eichmann must have had some other traits, other than just being very thoughtless. Even with my personal view, Arendt's conceptualization of the roots and consequences of this banality is useful to my thoughts and arguments. She explains that evil doing is not something that only an inherently nasty person could do. Her unsettling argument—that Eichmann was not a monster but rather painfully normal yet thoughtless — elaborates a more disturbing truth: under certain conditions, anyone might be capable of bad-doing. In assuming that those who collaborated with the Nazis were not simply monsters, Arendt then asks a profound question. If not monsters, then "What was it that made them behave as they did?" (p. 44). Arendt carefully defines the conditions under which the banality

of evil emerges as a consequence: "*Could […]* the habit of examining and reflecting upon whatever happens to come to pass, regardless of specific content and quite independent of results, *could this activity be of such a nature that it 'conditions' men against evil-doing*?" Arendt explains that even under totalitarianism, the ethical decision of participating or not participating in the demands of the ruler remains. Under conditions of terror, she says, most people will comply [with whatever that is asked of them] but *some people will not.* Arendt explains that we resist evil (bad-doing) by not being swept away by the surface of things, by stopping ourselves and beginning to think and reflect. It is important to note that here, self-reflection is not about mechanically applying the categories and rules – such as the ones we receive from social hierarchy (e.g., ministry documents or the content of the curricula). Nor it is about judging and making decisions on the bases of held-fast knowing of wrong and right. Instead, this self-reflection is to vigilantly and critically examine and re-examine the actions and the contexts, regardless of how ordinary they may seem.

From Arendt, I learnt that if someone like Eichmann (Trump, or Diddy) is simply labelled a monster, it becomes easier to distance oneself from the idea that ordinary people are also capable of committing harmful acts. This labelling creates a false sense of separation. Anyone might do harm, under certain circumstances, if they are thoughtless. Failing to engage in continuous self-reflection and critical thinking risks acting in ways that contribute to harm, often without recognizing the full consequences of the actions.

In thinking about why and how in teaching mathematics, part of the ethical responsibility be towards a shared inner sense of unity and solidarity, Rumi and Arendt gave us powerful tools to think about how to do this and why?

Rumi tells us how: Rumi says there is a powerful sense towards solidarity and commitment resides in us – in our sense of love, a sense of Eshgh. And the power of Eshgh does not need socially constructed accreditations or validations (fancy degrees, titles, or lives) — the power is already within us. To cherish and grow the Eshgh, we need constant self-reflection: To pause, to negotiate and re-negotiate priorities, actions, and responses—to consciously engage with our intention and awareness in every step.

Arendt tells us why: Inspired by Arendt's ideas, Rumi's invitation to self-reflect – to grow the inner Eshgh – appears to be more than just an invitation—it carries consequences. The consequence of not doing the self-reflection and self-thinking, it is articulated by Arendt. Arendt says bad-doers are not monsters, they are horrifyingly normal, but lack the capacity of self-reflection. Anyone, if thoughtless and not reflective, is capable of doing harm (in different degrees of course).

Therefore, going back to the I-Other conceptualization of ethical responsibilities, I suggest that the 'Other' could (and 'Should', according to Arendt) include a sense of collective solidarity and shared commitment. This means in the deciding what to teach and what not to teach in mathematics classrooms, part of the ethical responsibility is to our solidarity and commitment to other humans and our earth.

Where is mathematics and mathematics education?

In the above, I suggested a (utopian) possibility that schools would be primarily organized around values such as: Human dignity; identity and cultural diversity; critical thinking and ethical awareness; the joy of creating, engagement and the urge to explore; respect for nature and environmental awareness; and democracy and participation. Then current school subjects such as science, history, geography, language, mathematics and so on would be included in teaching the primary value subjects. How reversing the place of values (the ones noted in the Norway Curriculum for example) and the school subjects (including mathematics) could contribute to upholding the ethical responsibility towards inner solidarity and commitment? In this imaginary school, where does mathematics sit?

If mathematics is a means to read and write the world (see the life work of Gutstein), if mathematics is at the centre of our democracy (see the life work of Skovsmose), then mathematics becomes exactly the knowledge that sits at the heart of teaching our children to experience and reflect on different values and be prepared for tomorrow (for example, a tomorrow that stands together in resistance to any military actions). Now mathematics becomes a tool through which each student sees their capacity to Eshgh (the sense of solidarity and commitment): to believe that they have power to care, to bring people together, to acknowledge injustice, and to believe that a dedicated group can make changes. Our field has countless examples of mathematics being this tool. In search for how senses of solidarity and commitment might grow by the teaching and learning of mathematics, I read the proceedings of ICMI-27 study group Mathematics Education and the Socio-Ecological. I looked at this 550-page proceeding because I believe that contributions to this study group are rich international representations. In this proceeding, different studies have highlighted different capacities that impact and influence the growth of Eshgh (Solidarity and commitment) with and through mathematics; capacities such breaking the silences, taking a strong stance, standing against capitalism, individualism and brutal environmental violence, reflecting on press Freedom, social realities, and modern political systems and so on. The following table shows more details.

Solidarity and commitment	**Example**
Fair share versus equal share,	Andrà et al., (2025) explored the issue of fair share (value) in as opposition to equal share (division in mathematics) explaining how a preferred model brings out the value that guides the choice of mathematical model.
Dialogue between mathematical thinking and values,	Barwell (2025) focuses on the ecological challenges, in dialogue between the mathematical thinking (of how it can be used, of what it can be used to do) and the values (such as what are useful or desirable or undesirable things to do with mathematics" (p. 46).
Importance of taking strong stance	Bullock (2025) questioned the values in the face of global humanitarian and climate crises, arguing that those "who espouse critical interests in mathematics education to stand in direct opposition to those perspectives that either ignore or reify these crises" (p. 67). In upholding values, she says: "Anything less than such direct opposition is an exercise in racial liberalism (Mills, 2017) that stops short of justice (p. 67)
Against individualism	Povey & Angier (2025) highlight the neoliberal values of West and beyond about the competitive individualism, preparing students for a life of acquisitive consumer

and consumer capitalism.	capitalism and of the fabrication of the self. They criticize that in such case "mathematics classrooms can be experienced as hopelessly constrained by the dominant purpose of attaining qualifications with a high exchange value and by a performativity culture" (p. 100).
Breaking the silences	Rubel et al (2025) spoke about values such as 'Breaking silences' is an indicative of what is valued and considered as important, and thus also what can be troubled or challenged with mathematics.
Brutal violence against ecosystem	Viola & Corrêa (2025) challenge the humans values that make it possible to brutally commit violence against the region's ecosystem. The Western human is an element of an anthropocentric mathematics education. The multispecies entangled with the Anthropocene and Gaia can operate concepts such as scale and belongings, and many others to be invented by necessity or even contemplation, in a Mathematics Education of Terrans. They proclaim: 'Mathematics Education sleeps a lot, but it (yet) can only dream about itself' (p. 147).
Privileges and disparities	Estrella, Valero & Van Steenbrugge (2025) highlight how Eurocentric epistemology is privileged inside mathematics classrooms as shown by the disparities between school and community mathematics; and mathematics education creates people who are knowledgeable in English and can participate in occupations that are economically-valued; devaluing informal and culturally-rooted ways of doing mathematics outside school settings
Develop student agency	Hunter and Hill (2025) draw on the voices of young Pacific people to building on both family and community experiences and values related to mathematical wellbeing (MWB). They highlight the possibilities of connecting knowledge systems related to growing, collecting, and cultivating food in mathematics classrooms to modelling tasks and mathematics for social justice-oriented and how MWB values can be leveraged to develop student agency.
Press Freedom and social realities	Hilario & Joaquin (2025) Explore Press Freedom to demonstrate the value of integrating social realities into teaching statistics, as responses might differ if the context were reduced to a mere word problem without real-world relevance.
Creating human graph	von Bülow (2025) creates human graph activity in which students took on roles from data categories on wealth, and created a tableau with their bodies to spatially represent the economic gaps. von Bülow explains that During the activity, mathematical objects were students' bodies, statistics were people's experience, and social concerns were emotions and voices in the classroom.
Securing a sustainable future	Fran & Vistro-Yu (2025) It has been pointed out in earlier discussions that their inherent mathematical knowledge systems highlighted social equality and fairness as important moral values, as demonstrated in their product sharing activities. With a clear understanding that these inherent mathematical knowledge systems are crucial in securing a sustainable future, this strengthened their assertions of what is right for the community and the rest of the people of Sibuyan.
Challenges of modern political systems	Khan (2025) Challenges the current limited political power of 'green' parties and the democratic values that underpin modern political systems. here may come a time when the current enterprise of Mathematics Education as a specific signifier comes to an end and becomes subsumed under a more inclusive framework (Isaac Asimov)
Space for other knowledges	Meléndez et al (2025) Western concepts, ways of thinking and even values. But the positioning as learners allows them to appreciate local culture and even to be allowed to participate. When mathematical content and thinking appear in this approach, they might be questioned and problematized, which has great consequences for mathematics education.

In these studies, the decisions that are made about what to teach and what to omit in mathematics classrooms reflects a fundamental disposition to live in harmony with the shared sense of Eshgh – sense of solidarity and belonging together. The suggestion is that one way to expand the 'Other' in the I-Other ethical responsibility is to not only focus on teaching mathematics for the growth of Eshgh, but also on how to utilize the sense of solidarity and commitment to pause for self-reflection – reflection on the actions, responses and choices.

In summary, my argument is an invitation to expand the sense of ethical responsibility to also include a constant awareness of the consequences of our teaching actions towards the sense of oneness and solidarity, no matter how ordinary or routine the actions may seem. Every choice made in mathematics classroom—whether in what we teach, how we approach a topic, or even what we choose not to teach—carries an ethical responsibility. And here, the argument is that part of the ethically responsible is towards the sense of Eshgh that unifies me with everyone and everything that one is in relation with – all the members of my planet.

I finished by stating that our students deserve to know better mathematics. They deserve to see through the learning of mathematics that:

1) the importance of continually considering the consequences of our actions, regardless of how ordinary or routine they may appear (stemming from Arendt)

2) and that the power to care, to unite, and to drive meaningful change (like the sun) is already inside them (Stemming from Rumi)

References

Aguirre, J., Herbel-Eisenmann, B., Celedon-Pattichis, S., Civil, M., Wilkerson, T., Stephan, M. & Clements, D. H. (2017). Equity within mathematics education research as a political act: Moving from choice to intentional collective professional responsibility. *Journal for Research in Mathematics Education*, *48*(2), 124-147.

Appelbaum, P., & Davila, E. (2007). Math education and social justice: Gatekeepers, politics and teacher agency. *Philosophy of Mathematics Education Journal*, *22*, 1-23.

Atweh, B. (2012). Mathematics Education and Democratic Participation Between The Critical and The Ethical. In: Skovsmose, O., Skovsmose, O., Greer, B. (eds) Opening the Cage. New Directions in Mathematics and Science Education, vol. 23. Sense Publishers, Rotterdam. https://doi.org/10.1007/978-94-6091-808-7_17

Atweh, B., & Brady, K. (2009). Socially response-able mathematics education: Implications of an ethical approach. *Eurasia Journal of Mathematics, Science and Technology Education*, *5*(3), 267-276.

Boylan, M. (2016). Ethical dimensions of mathematics education. *Educational Studies in Mathematics*, *92*, 395-409.

De Freitas, E. (2025). More-Than-Human Mathematics and the Power of Speculative Thought. In Le Roux, et al. (2025) *Mathematics Education and the Socio-Ecological*: pp. 15-16.

Ernest, P. (2012). What is our first philosophy in mathematics education?. *For the learning of mathematics*, *32*(3), 8-14.

Ernest, P. (2018). The ethics of mathematics: Is mathematics harmful?. *The philosophy of mathematics education today*, 187-216.

Ernest, P. (2019). The Ethical Obligations of the Mathematics Teacher. *Journal of Pedagogical Research*, *3*(1), 80-91.

Gutstein, E., Fey, J. T., Heid, M. K., DeLoach-Johnson, I., Middleton, J. A., Larson, M. and Tunis, H. (2005). Equity in school mathematics education: How can research contribute? Journal for Research in Mathematics Education, 36(2), 92–100

Hannah Arendt, Correspondence between Grafton and Arendt, (September 19, 1963) *draft*, *Hannah Arendt's Papers*, Manuscript Division, Library of Congress, p. 06. (hereafter cited as 'Arendt to Grafton').

Le Roux, K., Coles, A., Solares-Rojas, A., Bose, A., Vistro-Yu, C., Valero, P., Sinclair, N., Makramalla, M., Gutiérrez, R., Geiger, V. and Borba, M. (Eds.) (2025). *Mathematics Education and the Socio-Ecological (Proceedings of the 27th ICMI Study Conference).* Berlin, Germany: International Commission on Mathematical Instruction (ICMI), and Quezon City, Philippines: MATHTED (Philippine Council for Mathematics Teacher Educators).

Radford, L. (2023). Ethics in the mathematics classroom. *Hiroshima Journal of Mathematics Education*, *16*, 57-75.

Radford, L., & Santi, G. (2022). Learning as a critical encounter with Prospective teachers conversing with the history of mathematics. *ZDM–Mathematics Education*, *54*(7), 1479-1492.

Skovsmose, O. (2004). Research, practice and responsibility. Article presented as part of a Survey Team for the International Congress on Mathematics Education in Copenhagen 2004. http://www.icme10.dk/ (Click on ‘PROGRAMME’ , then ‘ICME-10 Survey Team’, and eventually ‘ST1’.)

Skovsmose, O. (2006). Challenges for mathematics education research. In *New mathematics education research and practice* (pp. 33-50). Brill.