Advocacy and Subversion: Using the Past to Think About Mathematics in the Future

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As we go into the second quarter of the twenty-first century, we enter a troubling time for mathematics education in educational institutions at all levels. This troubling time comes with a multitude of challenges that seem to restrict how mathematics educators can incorporate research-based understandings into their practices. Using Bernstein's pedagogic device, I discuss where possibilities for identifying the "unthinkable" lie at the curriculum level, the institutional level and in the classroom, using examples from my own research. These possibilities can be linked to both advocacy with participants to create new spaces as well as to subversion in which existing spaces are used in unexpected ways, to proactively find alternative ways to act upon the unthinkable, so we can respond to the challenges that affect our practices.

In a recent editorial for the *Journal of Research in Mathematics Education*, entitled "Mathematics education at the end of the world", Horn (2026) stated "education in general and mathematics education in particular currently exist in precarious environments across the globe" (p. 1). It seems that rather than seeing mathematics education as a contributor to solutions for the more complex climate and geo-political crises engulfing our world, politicians seem intent on redirecting attention away from these difficult-to-tackle crises to instead present the current incarnation of education as being the problem. By doing so, they are then able to offer a solution that will save the economy and to a lesser extent the society. For example, Hattam et al. (2009) showed how an Australian Minister for Education used the media, through a specific contact, to present school education at that time as being in crisis and to blame teachers and their innovative pedagogies for this crisis. The consequence of this displacement of attention onto these so-called educational crises resulted in discussions being shifted from the purposes of education and what it could contribute to the wider society. This can be seen in the findings from research that Troels Lange and I did on public discourse to do with the introduction of the MySchool comparison website for the results of the Australian national tests (NAPLAN). A focus on these test results resulted in teachers and parents blaming each other for children's lack of attainment in mathematics (Lange & Meaney, 2014). In the media, the Federal Minister for Education had highlighted the importance of adding value to children, situating them as commodities which could be evaluated based on their achievement levels. Thus, rather than potentially discussing how education could contribute to the aims of society, it became possible for the Minister to situate the discussion of mathematics education as being about who was to blame for individual children not doing well on a national test.

In Norway, also with Troels Lange (Lange & Meaney, 2018), we investigated how the Norwegian Minister for Education used media discussions to make a case for the need for major changes to Early Childhood Education and Care (ECEC). These included more focus on "learning/teaching" and away from working with children's own interests, which had been the foundation for ECEC in Scandinavia (Bennett, 2005). This was a major shift from the philosophical foundations of ECEC and how mathematics education should be considered within it (Schaanning, 2015). The Minister's argument for this change was tenuous at best, in that in a debate piece in a newspaper, he tried to situate the economic future of the country as dependent on the society gaining more PhDs in mathematics and science. To gain these PhDs, the drop-out rate from upper secondary school needed to be reduced. For this to happen, more

(2026). In N. Berger, M. Thompson, J. Ley & C. Wilsmore (Eds.), *Beyond boundaries: Strengthening futures in mathematics education. Proceedings of the 48th annual conference of the Mathematics Education Research Group of Australasia, Sydney* (pp. 25–33). MERGA.

students needed to pass the exams at the end of junior secondary school. This would happen if interest in mathematics and science was awakened earlier in ECEC. In structuring this argument, the Minister does not explicitly state that his intention is to shift the focus to more direct teaching of those subjects but by ignoring that the ECEC curriculum already required children to engage with mathematics and science, he presented the situation as a crisis he knew how to overcome. This is an example of what Smyth (2006) described as the use of the media to promote policy change, "when the ideological agenda of government needs to be concealed, for example, in the desire of government to more closely and tightly control the work of teachers and schools, it is convenient to disguise the real intent" (p. 310). As a result of lobbying by those who worked in ECEC, the teachers, the proposed policy change was rejected (Fosse et al., 2018), but there remain pressures to undermine the current philosophical foundations of ECEC.

Thus, to determine how mathematics education could contribute to resolving the actual crises facing society, such as climate change and geopolitical tensions, there is a need to identify ways to resist proposed policy changes through advocacy or to subvert their focus. To discuss the opportunities for doing this, I first briefly describe Bernstein's (2000) pedagogical device, which he developed to show how knowledge was transmitted from the level of policy to the level of classroom practices. In this device, Bernstein (2000) discussed how the contestation of what constituted valuable knowledge allowed for spaces to think the "unthinkable". Three examples from previous research illustrate how recognition and implementation of the "unthinkable" at each level of the device could be achieved through subversion and advocacy.

Bernstein's Pedagogic Device

Bernstein (2000) argued that the pedagogic device controls what knowledge comes to be valued at different levels of the education system, which he labelled the fields of production, recontextualization and reproduction. For example, the selection of "official knowledge" by policy makers in the field of production, results in teachers having few independent choices in the field of reproduction. However, the transmission of policy initiatives, as "official knowledge" down through the recontextualising and reproductions fields, is never straight forward. This is because there is always competing valued knowledge within and between each field, which results in adaptions being made. Bernstein was most interested in the processes, which led to the adaptions. These processes he labelled the rules of the pedagogic device:

1. *Distributive rules*: These rules distributed forms of knowledge to different social groups. In this way, distributed rules distributed different forms of consciousness to different groups. Distributive rules distributed access to the 'unthinkable', that is, the possibility of new knowledge, and access to the 'thinkable', that is, to official knowledge.
2. *Recontextualising rules*: These rules constructed the 'thinkable', official knowledge. They constructed pedagogic discourse: The 'what' and the 'how' of that discourse.
3. *Evaluative rules*: These rules constructed pedagogic practice by providing the criteria to be transmitted and acquired. (Bernstein, 2000, p. 114)

Although Bernstein focused on the processes on how valued knowledge comes to be selected in each field, previous research has shown that the rules can support knowledge in the lower fields contributing to changes in what is value at the policy level (Meaney, et al., 2013). The example of the rejection of the proposed changes to ECEC policy in Norway, could be consider an example of the highly valued knowledge of ECEC teachers reasserting its importance at the policy level.

In the next sections, I discuss examples of advocacy and subversion in regard to the "unthinkable" possibilities which can become available when the selection of valued knowledge from different groups in the education system are brought together.

Opportunities and compromises in the production field

Decisions about educational policy currently seem to be made with limited input from educators, including teachers, teacher educators and researchers. Nonetheless, there are likely to be competing discourses about what is valuable knowledge from specialists that should be selected for inclusion in curricula. For example, Bernstein (2000) highlighted the role of subject specialists, such as mathematicians. Mathematicians "distributed" their knowledge, alongside that of other specialists who were deemed to have relevant knowledge or requirements, such as industry. Curricula writers select from what is made available to determine the official knowledge of the curricula, based on interpretations of what is needed by the society. Three decades ago, Ellerton and Clements (1988) suggested that the role of mathematicians had diminished in curricular planning in Australia, with others such as teachers and mathematics educators having a more prominent role. This may no longer be the case with fulfilling industry demands for specialised workers, seemingly a more legitimate purpose for education, than solving climate and geo-political crises.

The impact of economic demands on the delivery of education, such as the instigation of New Public Management in the 1980s and 1990s, has been examined in regard to general education policy (see for example, van der 7et al., 2015), but less so in regard to mathematics education. New Public Management was instigated "to make educational policy more effective and more efficient. Often, budget reductions were also at stake" (van der Sluis et al., 2017, p. 304). As a result of these economic policies, in New Zealand:

> The Tomorrow's School legislation (Lange 1988) devolved responsibility for providing education to local communities under a charter system. As well, some of the functions previously carried out by a large Department of Education, including curriculum development, were contracted to external providers. However, this legislation mandated state control of curriculum development and implementation as a means of ensuring schools were accountable (Codd 1995). National curriculum development was to be one of the new Ministry of Education's goals for the 1990s. (McMurchy-Pilkington et al., 2013, p. 344)

For Māori, these changes provided possibilities to gain funding for the schools that they had set up, outside the government education systems, to ensure their children gained fluency in *te reo Māori*, their Indigenous language. *Te reo Māori* had been recognised as under dire threat of being lost at the end of the 1970s (Meaney, et al., 2012). The compromise from accepting state funding was that the school communities had to be accountable to the Ministry of Education by, for example, showing how they followed curricular requirements.

For these Māori educators, who Bernstein (2000) would have labelled "individuals *outside the field of production*" (p. 115), having their valuable knowledge incorporated into curricula was not straight-forward, but occurred as a result of identifying the "unthinkable". The decision to revise curricula in the 1990s gave Māori mathematics educators the opportunity to insist on a version written in *te reo Māori*. Although the learning objectives could not be changed, the translated version, contributed to the standardisation of mathematical terms and expressions in *te reo Māori*, allowing students to move between Māori schools without having to learn new vocabulary (McMurchy-Pilkington et al., 2013). It also began the process of Māori mathematics educators gaining skills in policy and curriculum development that had not previously been available. In subsequent curricular revisions, recognition of their knowledge and skills led to being able to adapt the mathematics curriculum to better suit the aspirations of Māori communities. These revisions have also provided inspiration for other Indigenous communities to agitate for their own mathematics curriculum (see for example, Sámedigge, 2025). Even though political forces are currently working to deny the value of this expertise, the skills and expectations about what can or should be achieved by Māori for the benefit of Māori students, going beyond training them to be workers for the economic benefit of a society, does not disappear.

In summary, the unthinkable appears when valued knowledge and skills juggle with expectations about the purpose of education at the policy level. Subversion of policy makers' expectations can occur when the unthinkable is recognised within the contestation.

Opportunities and compromises in the recontextualisation field

In the pedagogic device, official knowledge becomes recontextualised as specialists in the education field, such as teacher educators, textbook writers and national examination writers, make sense of it within existing organisational structures (Bernstein, 2000). The independence of these specialists from each other can lead to contestation about what is important knowledge. How much space there is for recontextualising these different interpretations of the official knowledge in curricula will also depend on how independent the recontextualisation field is from the production field. For example, when the policy level has pre-eminence in an education system, teacher educators may be limited in what they can discuss with preservice teachers. When the first national curriculum was introduced into Australia, Briant and Doherty (2012) found that some teacher educators, including one mathematics teacher educator, were determined to maintain their commitment to social justice within their work with preservice teachers, while acknowledging the new pressures on doing so. In contrast, other teacher educators, including another mathematics teacher educator, felt pressured to align their teacher education with the foci in the curriculum, reducing the importance that they gave to raising social justice issues. In recent times, the independence of teacher education in places such as Australia to decide what should be provided to preservice teachers has become restricted, perhaps without a clear research basis for these changes (Knipe & Fitzgerald, 2017).

Yet, in some countries, like Norway, teacher education remains fairly independent of the schooling systems, with an understanding that preservice teachers' work can continue well beyond the immediate situations found in schools. This independence allows for teacher educators to identify and develop their teacher education on issues that teachers need both now and in the future. Previous research at our institution had suggested that preservice teachers tended to situate multilingual students as problematic if they were not yet fluent in the language of instruction or when they were fluent, the same as Norwegian students, thus requiring no further adaptions to their teaching (Rangnes & Eikset, 2019). To tackle this issue, in an externally-funded project, we recontextualised valued knowledge from different sources to develop understandings about how to support preservice teachers.

The core values of the curriculum included developing students' identity and cultural diversity in all subject areas (Utdanningsdirektoratet, 2019). This provided a legitimate basis for raising with preservice teachers how to work in multilingual mathematics classrooms to support students' cultural identities. However, we recognised that our interpretation or recontextualising was perhaps not quite what policy makers had envisioned. Initially we identified the kinds of teaching practices and the knowledge about their students, teachers would need. We also included the role of being advocates (Lange & Meaney, 2019), as understanding what students need for their learning is of limited value if there is no clear path to ensure that it is provided. In Norway, educators can also make submissions to policy proposals and have opportunities to debate policy issues in the media. Thus, knowing more about both in-class and outside the classroom advocacy was deemed important (Meaney & Rangnes, 2024).

To develop our understandings about the role of advocacy and how to raise it with preservice teachers, knowledge about what our preservice teachers might already know about teaching in multilingual classrooms and learning about their students from previous research was brought together. Recontextualising these different kinds of knowledge led us to utilise the contradictions in the preservice teachers' conflicting understandings about multilingual students learning mathematics as starting points for discussing the role of being an advocate.

As supporting preservice teachers to engage in these kinds of reflections was new for us as teacher educators, we are still learning how to develop our teacher education practices. As a result, we continue to bring in new understandings as part of our recontextualisation, such as the core values, of the curriculum, so that preservice teachers have a wider knowledge base from which to develop their classroom practices (e.g., Kasari & Steffensen, 2026).

Recontextualising policy will always happen as it comes into contact with established understandings at different levels of the education system. Yet, making use of what had previously been unthinkable during the contestation of knowledge may not always lead to benefitting society. Horn (2026) described how in the USA, "socially advantaged parents" made use of the "democratic visions of mathematics education encapsulated in 'mathematics for all'", described in the National Council for Teachers of Mathematics (1989) Standards, as "they hoarded educational opportunities for their own children" (p. 2). Thus, rather than benefitting the society, education became a way of adding value to their children, while reducing this possibility for others.

Opportunities and compromises in the reproduction field

For Bernstein (2000), the evaluative rules determine what becomes appropriate pedagogical practices, in the reproduction field. These practices are affected by the content which needed to be taught and how it should be made available to which student groups, depending on aspects such as age. To determine appropriate pedagogical practices for specific classrooms is affected by curricula, as well as established traditions within the schooling system. Nevertheless, there remains possibilities for identifying new previously unthinkable practices, although recognition of these possibilities becomes more difficult, the more regulated the schooling system becomes. For example, we know that high-status tests, even if low-stakes for students, can have an impact of what teachers consider is possible to do in their classrooms (Lange & Meaney, 2012)

In Norway, another core value in the curriculum is the requirement to develop students' democratic competencies, which could be interpreted in a multitude of ways, including those which took a broad view of what democratic competencies could be. In work with Trude Fosse, we have considered how this core value could be developed into pedagogical practices that could provide students with skills to responding to the crises facing the planet. Our focus was on supporting young students to reflect on societal issues, such as fairness, using mathematical understandings. We did this by using an established practice of having children pose and solve a written mathematical problem, which could include pictures and symbolic representations, known as a *regnefortelling* (Fosse & Meaney, 2024). We chose to do this after an investigation of textbooks for Grade 2 provided few possibilities for connecting the mathematics children were expected to learn to their everyday experiences (Fosse & Meaney, 2021), let alone to some of the important issues facing society and the world. Consequently, we asked teachers, we knew, to have their Grade 2 students produce a *regnefortelling*, about a fair and an unfair situation, using an example of *regnefortelling* from earlier research as a prompt.

In Figure 1, there are two examples of *regnefortelling*, about unfair, *urettferdig*, and fair, *rettferdig*, situations. There are no written problems, with the drawings providing clues to what the problems are. In the first drawing, Mia is paid 5 kroner for cleaning while Mie is paid only 2 kroner. Mie is very unhappy, reflected by the mouth turned downward. In the fair situation, both children get 5 kroner. This regnefortelling illustrates how mathematics provides a way to compare the pay rates for cleaning and could be used to discuss issues of equal pay for equal work. In the second drawing, the unfair situation is when Peder gets only 2 pieces of pizza, with Peder crying to show his unhappiness. Mia on the other hand gets six pieces of pizza. The fair situation is when both people get four pieces of pizza, providing an opportunity to discuss fractional parts. The distribution of resources, often food items, provided insights into these children's understandings of fair and unfair.

Figure 1

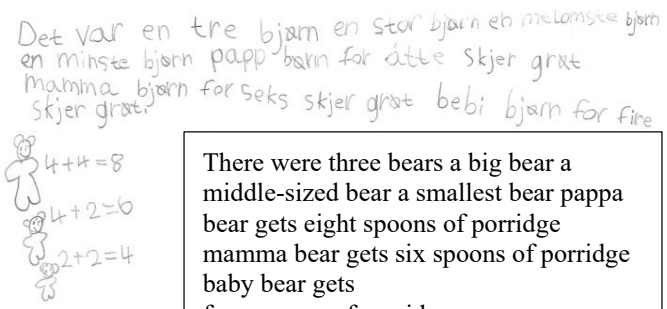
Examples of 7-year old children's understanding of fair and unfair situations

In a later project, Grade 1 students were asked to produce *regnefortellinger* in which the fair outcomes involved an uneven distribution of resources. Examples from two six-year olds can be seen in Figure 2. In the first set of drawings, the child sets out how when dad gets all the boxes to stand on, then the children cannot see. A redistribution of the boxes allowed everyone to see over a fence. In the second picture, the child used the story of Goldilocks and the three bears to also show an uneven but fair distribution of resources. Although it is clear that the children understand that some circumstances require uneven distribution of resources to be fair, writing problems and solutions about these situations seems difficult. For this approach to be developed into a pedagogical practice that contributes to children's understandings about how mathematics could be used to respond to societal issues, more knowledge is needed about the kinds of prompts that would support children to produce their problems and solutions.

Figure 2

Examples of 6-year old children's understanding of fair and unfair situations

This is dad standing on 3 boxes and the children standing on nothing.



There were three bears a big bear a middle-sized bear a smallest bear pappa bear gets eight spoons of porridge
mamma bear gets six spoons of porridge
baby bear gets
four spoons of porridge

In this example, the previously unthinkable in the reproduction field was the possibility to take an established practice, that of writing *regnefortellinger*, to develop children's democratic practices through working with more complex issues than typically found in textbooks. If mathematics is to be used in solving some of the issues now facing our society and the world we live on, there is a need to previously unthinkable possibilities to support students to do this.

Conclusion

Bernstein's (2000) pedagogic device illustrates how contestation between the valued knowledge of different groups at different levels of the education system can provide opportunities to identify the unthinkable. Given the pressure that education, including mathematics education, is facing, it is important to find ways to bring different knowledges

together so that new possibilities for educational practices are identified, developed and implemented, which could contribute to the good for society.

However, bringing together different knowledges so that previously unthinkable possibilities can be identified is not easy, nor is it easy to implement these new possibilities into existing structures. Subverting the intention of curricula, intentionally or unintentionally, can result in making unsatisfactory compromises, unless the aim for implementing the unthinkable possibilities remains clear. Recontextualising traditional practices, such as having children produce *regnefortellinger*, or interpreting core elements of curricular, such as identity and culture, to support preservice teachers to learn to be advocates, are forms of subversion. Although still requiring further trialling and refining, the identification and implementation of such new practices is becoming even more necessary. For example, supporting preservice teachers to gain understandings into advocacy has become critically important as funding for students who are still learning Norwegian as an additional language, is now being severely limited with the councils who fund the schools, looking for ways to save money. Redefining how the laws pertaining to teaching in the home language are to be interpreted has resulted in some students no longer being eligible. This has resulted in these students working in general classrooms, without even the small amount of support that these dedicated support teachers had provided. However, to ensure that new and alternative practices can be incorporated into different levels of the pedagogic device may require mathematics education researchers and teacher educators to become advocates in order to promote these new and different practices.

The three examples give insights into how the interaction between the valued knowledge of different groups provides spaces for new understandings about situations to arise and be acted upon. Although the crises that we face today are different to those of the past, looking back at how mathematics educators have previously tackled challenges, gives "critical hope" (Horn, 2026) about how to move forward in the future. Understanding how official knowledge, such as the curriculum, is adapted as it moved down through the pedagogic device provides insights into how this "critical hope" can be realised, through subversion of existing practices. However, for knowledge about these new practices to move up through the device, as shown in previous research (Meaney, et al., 2013), so that it becomes valued in discussions about curriculum, then mathematics educators need to develop their own advocacy skills.

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