

Mathematics Education Storylines and Cultures in Indigenous and Migrational Contexts

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In November 2022, we organised a conference where researchers, teachers, elders, doctoral students and prospective teachers from “all over the world” were invited to participate in conversations about mathematics education in Indigenous and/or migrational contexts. The conference took place in Alta, Northern Norway. In this area, Sami, Kven and Norwegian peoples live together side by side. This is often referred to as “the meeting of the three tribes.” The Sami and Kvens have their own history, traditions, cultures and languages, which have been partly absorbed into Norwegian traditions and cultures as a consequence of “effective” assimilation policy practices. Today, however, individuals are taking back their minority identities and there are ongoing processes of revitalising the languages. Within this context, the conference welcomed contributions to explore this complexity, as well as those experienced by minorities and migrants, in the mathematics classroom and in mathematics education. The articles in this double special issue are based on presentations and conversations at the conference. We thank Kaja Burt-Davies for her logistical help in organising the conference and the manuscript processes for the articles in this special issue.

The conference was funded by UiT the Arctic University of Norway and as part of a larger research project supported by the Norwegian Research Council: The MIM project “Mathematics Education in Indigenous and Migrational contexts: Storylines, Cultures and Strength-based Pedagogies”. The MIM-project is aiming to answer large questions: How can mathematics contribute to more equality and social justice in school? And how can the subject itself be enhanced by the diversity of languages and cultures? Indigenous people

have, through colonisation, experienced such educational challenges for generations. We also see similar tensions in classrooms with children and teachers from other minority groups. This is in addition to the high number of all students who report disliking, or even hating the subject (Andersson et al., 2015). These tensions are occurring in Norwegian classrooms. The MIM research project is investigating how mathematical education develops in multilingual and multicultural classrooms in Norway, where different languages and cultures can hinder, support or challenge learning in mathematics education. In particular, we are looking at classrooms with a high number of different languages and cultures, including Norwegian.

Many of the 42 participants at the conference are connected in some way to the MIM project, but the invitation extended to others researching mathematics in Indigenous and migrational contexts, in Norway and beyond. However, the group of editors of this special issue and the conference organisers are all connected to the MIM project. Our choices of whom to invite to the conference were guided by our orientation to the mathematics classrooms with Indigenous and newly migrated students. In short, our orientation aligns with our project goals: to investigate educational challenges in mathematics education in times of societal changes and movements. In our research, in the conference and in this special issue, we promote education responsive to diversity by first, constituting an arena for minoritised students' and teachers' voices, and second, through participatory research, developing and evaluating strengths-based pedagogies. These are research based pedagogies deriving from social, cognitive, and positive critical theories, building upon individuals' strengths and assets identified by examining past positive experiences (Adiredja & Louie, 2020; Louie et al., 2021); encouragement of hope and optimism and development of emotional satisfaction with the present (Seligman & Csikszentmihalyi, 2000) hence moves away from cultural-deficit orientations and instead promotes achievement for all students.

Language and Culture - Storylines and Positioning

Linguistic and cultural challenges are not new. Indigenous communities have experienced them, as have children from non-dominant communities in other contexts than Norway (e.g., Canada, New Zealand, South Africa, USA). Tensions in education are intensified by language and cultural differences in times of large migration (Cenoz & Gorter, 2010). Classrooms with a high number of students from different migration waves, historically homogeneous communities with newcomers in their schools for the first time, and Indigenous schools with endangered languages are contexts that have been described in research, society and media as problematic due to race, gender, culture and religion, hence impacting *all* students. Thus we engage in participatory research to address these important challenges in mathematics classrooms. Students' relations with and expectations for future working life are considered as most important and relevant to teaching and learning mathematics.

Contrary to Dewey's (1916) suggestion to "teach a child, not a subject," the language and culture of mathematics classrooms may in many cases emphasise teaching the subject rather than the human, hence missing possibilities for developing diverse mathematics and for students to develop as humans within their (mathematical) language and culture. Languages may be the most obvious challenge in diverse mathematics classrooms. Translanguaging (García & Wei, 2014); code-switching (Bose & Clarkson, 2016) and other promoted methods (see Moschkovich, 2002; Setati, 2008) are not always available for students even when teachers see languages as resources. Culligan et al. (2023), in this special issue, discuss the role of language around "some challenges, opportunities, key questions, and ways forward for research in mathematics in Indigenous and Migrational (MIM) contexts" (p. 145). They "challenge researchers in MIM contexts to keep language ever present in the

dialogue, recognizing peoples' complex relationships with it and its connections to community, land, culture, identity, and mathematics" (p. 160).

With investigations of the mathematical classroom interaction experiences of minoritised students, it is important to understand the contexts. There is a rich general research body on migration, education and language (Cenoz & Gorter, 2010), but little on migration and mathematics education specifically. A small body of research on migration and mathematics education in Sweden shows these students "are positioned in discourses that contribute to ... gaining poorer performance in school mathematics than the 'Swedish' students" (Svensson Källberg, 2018) and immigrant students' feelings of risk when taking part in mathematical conversations (Ryan, 2019). However, one of the contributions at the MIM conference shows what a great support and resource parents and families can be for researchers and teachers. The study of Yaro (2023) demonstrates counternarratives of African immigrant families to counter racial stereotypes through awareness of the deficit narratives in the public discourse. Mathematics may be a gatekeeping subject, but also an empowering subject.

The linguistic challenges connect to cultural differences and conventional characteristics of the discipline of mathematics. Deficit discourses about bi/multilingual students and teachers may further stigmatise or cause harm (Andersson & le Roux, 2017). There is therefore a knowledge gap in how mathematical knowledge crosses borders and what pedagogies might counter deficit discourses and address both multicultural and linguistic issues in mathematical learning contexts that include Indigenous, migrated students and others in a holistic way. One paper at the MIM conference demonstrated the role of the discipline itself and how certain areas of mathematics may be more important for making space for cultural heritage than others. Through examples of how combinatorics appear in a range of traditional skills and areas of traditional livelihood in the Sámi culture Fyhn and

Steinfjell (2023) argue that a “stronger focus on combinatorics might have caused a more positive attitude towards Sámi mathematics” (p. 16). We are all, as individuals, in our groups and families, in our professional life and as citizens of the world, representatives of unique world heritage. To protect us all we have the UNESCOs Convention for the Safeguarding of the Intangible Cultural Heritage, and Fyhn and Steinfjell argues that the exclusion of combinatorics can be a breach of this convention. This shows the considerations that also policy makers need to be aware of. Looking at decolonizing work, Sámi mathematics teachers are decolonizing their school mathematics through developing culturally based oral examinations (Fyhn et al., 2016) and interdisciplinary teaching units (Fyhn, et al., 2017; Jannok Nutti, 2013).

The relationship between youths’ and teachers’ experiences of language and cultural diversity in mathematics classrooms needs new ontological and epistemological solutions. Our MIM project aims to fill these knowledge gaps regarding how to solve linguistic and cultural challenges in education through developing strengths-based pedagogies. Our project brings multicultural/multilingual contexts into conversation with each other by identifying pedagogies that support positive student experiences and discuss these pedagogies across contexts and nations. Several of the articles in the special issue give us valuable insight in how we can support our students.

People interpret their experience through known storylines. Storylines are “lived stories for which told stories already exist” (Harré, 2012, p. 198). Storylines make certain positions available, which have accompanying expectations for interaction. The storylines used by minoritised mathematics students to interpret their mathematics classroom interactions and the role of mathematics in their life trajectories is juxtaposed with the storylines used by the others in their classrooms and community. Certain storylines (and positionings that are associated with them) are available in any given situation. Høyer-

Hansen and Andersson (2023), interviewed students in a multilingual Grade 10 classroom in a Norwegian reception school (a school for newly arrived students). They identified the storyline “Mathematics is important for my future,” with the sub-storyline “... even though I'm not good at math.” Høyer-Hansen and Andersson (2023) interpret this as students seeing mathematics as a way to change available storlines and positioning; mathematics can create new socio-political opportunities.

Teachers are central in mathematics classrooms and they have the power to make a difference for how students are supported. Burt-Davies and Andersson (2023) investigate the storylines emerging in conversations with a mathematics teacher in a multicultural classroom. The context of their study is that the teacher aimed to prepare students for participation in a democratic society with teaching inspiration from Critical Mathematics Education. Burt-Davies and Andersson (2023) present four storylines, two about the importance of mathematics, one about the activity in mathematics classrooms and one about multilingual students’ opportunities to develop conceptual understanding in mathematics. From a CME perspective, Burt-Davies and Andersson (2023) argue that mathemacy is crucial for students’ opportunities to free themselves from existing discourses and repositioning in alternative discourses. Further, the fourth storyline they present has clear implications for newly arrived students’ mathematical learning opportunities: “For multilingual students to gain a good conceptual comprehension, it is critical that students are permitted to utilize their own language in the mathematics classroom.”

Several of the articles in this special issue apply positioning theory (e.g., Harré and van Langenhove, 1999) to understand students’ and teachers’ experiences in mathematics classrooms. It provides the required tools to understand *how* the people in an interaction may have different understandings both of the interaction and of the opportunities available to them within it. Herbel-Eisenmann (2023) considers positioning as praxis, and argues how

praxis cannot be picked up from one context and experience and moved to another context. This allows for drawing on more theories and to bring in critical, feminist, postmodern, and decolonizing perspectives to our use of positioning and with an aim to change and de-center.

Steffensen and Kasari (2023) investigate the characteristics of pre-service teachers' problem posing activities involving a modelling activity related to the refugee crisis in their article "'Forced to flee' – mathematical modelling and problem-posing in 7th grade." They draw on data from one group of pre-service teachers' assignments and follow-up interviews, where they reported on their experiences of planning and implementing the modelling activity with 7th-grade students. They focused on questions with the students relating to the refugee crisis, feeling the numbers, taking action against the crisis, and modelling for lived democracy.

Norwegian educational contexts identified as having linguistic and/or diverse cultural problems, particularly where there are misalignments among the teachers' and students' school and home languages (Steinkellner, 2017) is of particular interest. The challenges in such contexts are local but reflect global trends. They significantly affect our children and their learning, their relationships, their (mathematical) identities, and their possibilities for future citizenship and work life. Our social justice commitment is motivated by concern for students, but we also recognize that their success has implications for society. Society needs citizens who know mathematics, who are comfortable with it, and who have learned to use their mathematics with authority. The students in the classrooms will be the work force and citizen leaders of tomorrow.

Wirkola and Andersson (2023) report from interviews with previous students, now successful tradespeople and entrepreneurs that did not always succeed in school. They identified storylines at play addressing: 1) student perspective: "I'm so stupid anyway, so there's no point in trying," 2) school perspective: "School is not an arena for experiencing

mastery in mathematics”, and 3) differences between school and real life perspective: “You do not use the same mathematics at work as you learned at school.” These storylines illustrate that storylines and positioning available for a student at school may be different from those available for an adult in a job situation. One consequence of these differences may be that students feel alienated at school. Another study reporting a shift in how the students saw themselves in relation to mathematics, is the one by Simensen et al. (2023). By using positioning theory as a lens for the analysis of student–student interactions during collaborative test situations and post-test interviews with the students, the authors reflect on a consideration raised by the students: trust is crucial in collaborative test situations. The students in this study described how they had changed from “stupid” to someone who can do mathematics. That is, their storylines and positioning changed.

Pivots: Changing While Remaining Grounded - Participatory Work

In this special issue, we want to be attentive to *which storylines are available* and *why they are available*. The research community has recently begun extending the field’s understanding of the availability of storylines and identities in mathematics classrooms (Andersson & Wagner, 2019; Wagner et al., 2019). The MIM community’s investigation of the way students, teachers, school leaders, media and community members experience and talk about mathematics classroom interaction, and thus the way they enact the storylines they envision, will lead us to consider ways of opening up new possibilities of storylines. Gerbrandt and Wagner (2023) use the word “pivot” to describe these different perspectives available/visible from one point of view:

For us, the ultimate goal of storyline work is to redeem pathology-based storylines and thus provide bases for alternative ways to deem/identify the people at play in them. We suggest this can be achieved by identifying opportunities to pivot within a given storyline. The metaphor of the pivot connects us to basketball, which has specific rules about movement when in possession of the ball. As long as you continue dribbling the ball, you are free to move within the boundaries of the court. But the moment you stop

dribbling, you must keep one foot planted on the ground. The grounded foot anchors the body to a fixed point, but the other foot is free to orient your body towards any direction. While a beginner to the game might feel stuck after they stop dribbling the ball, an experienced player knows how to pivot their body to face a more desirable path. (p. 134)

Abathi (2023) investigates the learner as self-in-relation, a conceptualisation of interrelational epistemology, using a compass to illustrate the pivoting, where

...each self, like a drafting compass, has two legs, one leg rooted in history, experience and reflections and the other leg moving to make relations with other things: humans, non-humans, and knowledges (Abtahi, 2022). With the rooted leg rooted and the moving leg in movement, one can draw coherent relationships, similar to how a drafting compass can draw circles. (p. 234)

We would like to stay grounded in traditional knowledge, local languages and in healing of minoritized peoples and social and ecological systems to wholeness in sustainability, and Abathi (2023) considered UNESCOs Four Pillars of Education to Sustain the Commons and how the pillars can provide a concrete and practical base for connecting mathematics to the learner as self in relation.

Working with the local communities, with the students and teachers through participatory research is the approach of the MIM project. Throughout the project period, the project team has aimed to collaborate with students, practising and becoming teachers and school leaders. Participatory work is grounded in “a commitment to collaboration and partnership throughout the problem-posing, knowledge creation, and action-taking cycles of a project” (Brydon-Miller & Maguire, 2009, p. 88). Indigenous research ethics in Canada favour participatory research in their communities, emphasizing the principles of OCAP— i.e., Ownership, Control, Access, Possession.

The principles of participatory research were challenged by the pandemic. Also research projects had to adapt and restructure. The MIM project was just starting up when the pandemic hit, and had to flip the methodological approach and strategy for data collection:

Rather than starting with the student and working outwards via the teacher, school leaders,

the local communities regional and national policies to media, the MIM project started with the national media and went on circling inwards with online interviews with teachers and school leaders and then, when the society opened up, towards the student and the interaction in the classroom last.

Lunney Borden et al. (2023) describe how the pandemic pivoted their project from case studies to an online learning collective focused on understanding what locally meaningful STEM teaching and learning in Indigenous communities looks like when the goal is to do it in a good way. The outcomes, while different than intended before the pandemic, are strong. Lunney Borden and her group (2023) worked collectively and described emerging ideas about mathematics and land (where “Indigenous and ecological approaches might allow us to reimagine STEM” (p. 74)), language (and the need to make “space for Indigenous languages and linguistic structures” (p. 75)) and healing as well as justice and wholeness. This involves rehumanizing spaces for learning and decolonizing education with “meaningful mathematics emerging from and contribut[ing] to the local communities” (p. 76)

Morales (2016) reminds us that participatory work offers a democratic model of who can produce, own and use knowledge; there is a strength in jointly orchestrating data and analysis. In our MIM project, we will have conversational interviews with individual partners (e.g., students about their perspectives on their classroom experiences) and engage in cross-group conversational interviews (e.g., looking at data from the classroom). Morales (2016) highlights the importance of bringing together different forms of knowing, hence honouring and grappling with the tensions that result when new forms of knowing (and being) emerge.

We see our project as decolonizing work (e.g., Battiste, 2013; Tuck, 2009; Tuhiwai-Smith, 1999) in the contexts with Indigenous students and culturally responsive pedagogy in the case of the migrated students. As researchers, we have made some assessments about

what we want to achieve. We want to promote teaching that addresses diversity in the classroom, by letting the voices of students and teachers be heard. However, some tough reflections are necessary for us as (becoming) researchers with high standards and expectations for ourselves. Pasanha (2023) explains some of these in her article “Mathematics is like ‘iron chickpeas’: An upcoming researcher’s reflexive storylines.” In the process of becoming a researcher working with storylines, Pasanha realised the need to identify her own storylines as they impact her research on minoritized students’ mathematical experiences and storylines. Assaf et al. (2023) reflect on research ethics, motivated by events in the author group’s work with migrant mathematics students after COVID events forced them to change the nature of their research interactions in their article “Ethical Dilemmas When Researching Migration and Children’s Experiences of Mathematics.” This change came as a result of authors seeing how aspects of their power as researchers was dominating the research, and ultimately afforded children less agency.

One of the important contributions of our research will be to bring these wishes, principles and pedagogies together in mathematics classroom contexts. We hope the research will impact today’s children and future generations: their learning, their relationships, their (mathematical) identities, and their possibilities for future citizenship and work life. As teachers and teacher educators we have central roles in this. Nolan (2023) in her article “Modelling culturally responsive pedagogy: Studying a mathematics teacher educator’s practice” shares the tensions and struggles involved in being/becoming a culturally responsive mathematics teacher educator. With a literature review as the foundation, the author conducted a self-study in which prospective and practising teachers reflected on the author’s role as the course instructor and modelling of culturally responsive pedagogy (CRP). Nolan embraces her dual identities by both teaching through and about CRP: the teacher educator acknowledges that developing their own CRP is an essential step towards the

students to developing their CRP drawing on the culture of mathematics, of mathematics classrooms and of students' lives and communities. We see similarities in this to the way Pasanha (2023) reflects on her stance as a researcher among immigrant students while having her own experiences as an immigrant—two identities at play simultaneously. Nolan and Xenofontos (2023) also explored CRP in their study including five Canadian teachers enrolled in a CRP course. Their analysis showed that expressions of the five components of their COFRI framework (challenges, opportunities, fears, resistance, and insights) exist side by side and were even overlapping/intersecting with each other in the teachers' perspectives. The authors argue that integrated reflections (journals) in CRP courses is a promising way forward for development and growth for being/becoming a culturally responsive teacher of mathematics.

In the process of becoming, those of us not from a dominant group may face extra challenges in building a professional identity. Perlander and Sjøberg (2023) identified some storylines related to student teachers' sense-making of becoming teachers. The storylines “The Norwegian way of being a teacher includes adapting to the pupils rather than pupils adapting to the teacher” and “Teacher education is not suited for immigrant student teachers” points to such cultural challenges. However, the authors showed that (a combination of) parallel and conflicting storylines can initiate a renegotiation of the meaning of positions and can be used as resources for positioning.

We end the special issues with an article of Gerbrandt and Foyn (2023) titled “Wading into murky territory: Hunting for storylines at an academic conference.” The data was collected at the Mathematics Education in Indigenous and Migrational contexts (MIM) conference in November 2022 through observing the scheduled presentations and the informal discussions that took place at the conference. Reflecting on relationships between positionality, personal identity and the process of identification of storylines, the authors sum

up the conference in one overarching, or underlying, storyline ‘The need for change in the ways we approach teaching, learning, and researching school mathematics’. This connected the three storylines identified at the MIM conference: “We need more space”, “There will be tensions” and “Perhaps it is okay to be uncomfortable”.

Short Description of Each Article:

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Fyhn and Steinfjell show through three examples of how combinatorics is important for prospective Sámi mathematics curriculum: The Sámi braiding *ruvden* and the traditional reindeer ear marking involves intricate sorting and organising items, and the Sámi board game *Sáhkku*, displays many possibilities for how a player could move the pieces and develop strategies. All examples are cultural practices that show descriptive use of mathematical knowledge. The authors describe the cultural practices by connecting them to the framework Cultural Symmetry.

Wirkola and Andersson have interviewed people who did not succeed in mathematics in the school context, but now are successful in their jobs and have high socioeconomic status in their communities. The article gives insight into conflicting positionings, where the respondents felt “stupid” in school mathematics, but in their workplace or with their family, they master mathematics. The context of the study is a community where most people have higher socioeconomic status, but higher education has not been appreciated, neither historically nor currently. The article shows that the positions the students are offered make them act in a negative way, which can be detrimental to their education.

Simensen, Johannessen and Huru investigates storylines at play in collaborative test situations in mathematics in an upper secondary school in an area of Northern Norway where the majority have diverse Indigenous cultural heritage - that differs from the main national culture. By using positioning theory as a lens for the analysis of student–student interactions during collaborative test situations and post-test interviews with the students, the authors reflect on a consideration raised by the students: trust is crucial in collaborative test situations. Through the students’ talk about rights and duties collaborative tests turn out to be a strength-based approach for assessment in mathematics.

Lunney Borden, Wiseman, Lafferty, Sylliboy, Robinson, Glanfield, Ghostkeeper, West, Daoust, Ribbonleg and Bernard describe a research study that due to the pandemic became an online learning collective focused on how we engage in learning. The authors share emerging ideas from their collective work related to concepts of land, language, and healing in relation to mathematics. They ask what the obligation of mathematics education is to address these

ideas, to transform and decolonize mathematics education in ways that honour Indigenous knowledges in locally meaningful STEM teaching and learning in Indigenous communities.

Burt-Davies and Andersson investigate a 10th grade teacher's work within Critical Mathematics Education for promoting the interdisciplinary topics democracy and citizenship education, public health and life mastery in mathematics. Through analysing interviews with the teacher, the authors identified storylines significant for developing mathematics education to better correspond with the democratic society that students encounter outside of school and for better learning environments for multicultural and multilingual students.

Høyer-Hansen and Andersson focus on the potential for Critical Mathematics Education for teaching and as a resource for all children. In a 10th grade multilingual classroom in a Norwegian reception school (a school for newcomers) the authors identified four complex storylines about students' experiences, strengths, hopes and goals that provide a picture both of their foregrounds and impact for their learning. The main storyline found is "Mathematics is [not] important for my future" together with the two related storylines "The theme of economics gives a new picture of the future" and "Mathematics plays a bigger role in today's society than I thought". Through the fourth storyline identified "Learning mathematics in Norwegian is important" the students express the recognition that having multiple languages is an advantage but that linguistic and cultural differences make it difficult to get help, thus a fear of missing important concepts by using their mother tongue.

Gerbrandt and Wagner play with and deconstruct several storylines from the MIM project. The authors noticed how storylines that feature conflict offer more opportunities for reorientation, than do storylines that feature appeals to hope. The concept of storyline within positioning theory suggests that people make choices according to known or familiar storylines. The authors discuss how "[t]his process of reorientation resists the dominance of pathology-based storylines about mathematics education for students from minoritized groups and draws attention to the impact of orientation on storylines" (p. 126).

Culligan, DeWolfe and Simensen present perspectives that arose in discussions between the authors as featured panellists (DeWolfe and Simensen) and mediator (Culligan) in the closing symposium of the MIM Conference. Through four main discussion points; *challenges*, *opportunities*, *key questions*, and *ways forward*, the authors reflect on the role and importance of language in research in mathematics education in Indigenous and Migrational (MIM) contexts and issues such as colonialism and language loss. After an introduction of the three authors, their contexts, and their respective research interests, the role of language is examined in their respective contexts and research. The authors remind us of the importance of language for recognizing peoples' complex relationships with language, and how language is connected to community, land, culture and identity, as well as mathematics curriculum.

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Herbel-Eisenmann proposes positioning as praxis as a tool for action in mathematics education, for empirically exploring mathematics classrooms and for teacher professional development. The author offers two beginning examples of how this might occur. While recognizing that there is still more work to be done to realize such a shift, Herbel-Eisenmann argues that it is time for mathematics education researchers' (powerful) work related to positioning to move from a field that rarely gets read or used outside of academia and into action.

Assaf, Barwell, Abtahi, Suurtamm, Kane, Paquette and Stokmo reflect on research ethics, motivated by events in the author group's work with migrant mathematics students (after COVID events forced them to change the nature of their research interactions). Through discussions around ethical issues concerning consent, power relations, and children's agency and voice, the authors saw how aspects of their power as researchers was dominating the research, and ultimately afforded children less agency.

Yaro presents counter-narratives of six African immigrant parents and their children (10–15-year-olds) living in Canada, to elucidate what it means for them to participate in the mathematics learning of their children. The study's finding indicates that families' support for their children's mathematics learning was based on the popular neoliberal configuration of mathematics as a gatekeeping subject for future economic prospects and workforce. However, beyond immigrants (parents' dyad children) desire to participate in the workforce, supporting their children's mathematics fluency is yet another means of counterbalancing their social exclusion and positioning themselves as people of intellect especially in an environment where academic excellence in mathematics is racialised. The study challenges the majoritarian assumptions about immigrant families as disengaged and uninterested in their children's mathematics learning.

Nolan shares the tensions and struggles involved in being/becoming a culturally responsive mathematics teacher educator. With a literature review as the foundation, the author conducted a self-study in which prospective and practising teachers reflected on the authors role as the course instructor and modelling of culturally responsive pedagogy (CRP). By both teaching through and about CRP, the teacher educator acknowledges that developing their own CRP is an essential step towards the students to developing their CRP drawing on the culture of mathematics, of mathematics classrooms and of students' lives and communities.

Abtahi reminds us that “knowing is about understanding one's position in the webs of interconnected relations” (p. 233, including our constant interactions and the multidimensions of one's experiences. Through UNESCO's Four Pillars of Education to Sustain the Common the author introduces a concrete and practical base to better work with the learners on this side of knowing. While considering the learner as a *self-in-relations*, a conceptualisation of *interrelational epistemology*, may appeal to the theoretical aspects of teaching and learning

mathematics, the more pragmatic practices are highlighted with the self in relations to humans, non-humans, different systems of knowledge, traditions, cultural aspects, languages and more.

Pasanha focuses on minoritized students' mathematical experiences and storylines, and in the process becoming a researcher working with storylines, the author realized the need to identify her own storylines as they impact her research. Using the concepts of positioning, positions, storylines, and socio-political power relations, Pasanha reflection focuses on three storylines identified: "Positioning as a mathematics teacher in society is a prestigious thing", "Mathematics is tough like an iron chickpea, and one should work hard to become good at mathematics" and "Researchers actively taking part in teaching activities would be a great resource for the students and help the researcher get more perspectives from students".

Steffensen and Kasari, investigate the characteristics of pre-service teachers' problem-posing activities involving a modelling activity related to the refugee crisis. They draw on data from one group of pre-service teachers' assignments and follow-up interviews, where they reported on their experiences of planning and implementing the modelling activity with 7th-grade students. They focused on questions with the students relating to the refugee crisis, feeling the numbers, taking action against the crisis, and modelling for lived democracy.

Perlander and Sjøberg provide insight into how student teachers with diverse cultural backgrounds use storylines to make sense of becoming mathematics and science teachers. How they referred to and argued around the meaning of practices, features, and moral rules, and their argumentation for consequences of actions and commitments to positions, showed that (a combination of) parallel and conflicting storylines can initiate a renegotiation of the meaning of positions and can be used as resources for positioning. For teacher education, our results indicate the importance of making different positions and perspectives of being a teacher available to explore as part of developing a teacher identity.

Nolan and Xenofontos present results from a study including five Canadian teachers enrolled in a culturally responsive pedagogy (CRP) course. Through the lens of their COFRI framework on the five elements challenges, opportunities, fears, resistance, and insights, a key learning from their analysis was how expressions of these five components exist side by side and even overlapping/intersecting with each other in the teachers' perspectives. The authors present integrated reflections (journals) in courses as a promising way forward for how mathematics teachers and teacher educators can develop and let their perspectives grow. They discuss the potentially positive implications for the field of mathematics teacher education, being/becoming a culturally responsive teacher of mathematics, and for diverse cultures and funds of knowledge flourishing in mathematics classrooms.

Gerbrandt and Foyn share their analysis of data collected at the Mathematics Education in Indigenous and Migrational contexts (MIM) conference in November 2022 through observing the scheduled presentations and the informal discussions that took place at the conference. Reflecting on relationships between positionality, personal identity and the

process of identification of storylines, the authors sum up the conference in one overarching, or underlying, storyline “The need for change in the ways we approach teaching, learning, and researching school mathematics”. This connected the three storylines identified: “We need more space”, “There will be tensions” and “Perhaps it is okay to be uncomfortable”.

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