PRINCIPAL'S STORYLINES ABOUT LANGUAGES IN MATHEMATICS CLASS

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Principals play an important role in shaping, encouraging and supporting mathematics teachers in their daily work. They also have the responsibility for teachers and students' welfare. A survey of almost 1000 district decision-makers in the U.S, however, found that these administrators tend to make decisions about structuring students' opportunities to learn based on principles of equality rather than principles of equity (Herbel-Eisenmann, et al., 2018). Bound with, or with support of, regulating policy, principals move their school life forward day by day, being responsible for students' opportunities to learn in all subjects, including mathematics. Conversations and interviews with principals in this study focused on understanding the complexities of storylines or grand narratives—related to organizing mathematics education for Indigenous and (rather) newly migrated students in Norwegian schools. This paper addresses the storylines about these minoritized youth, mathematics and languages.

Our research goal is to understand a range of "available" storylines (Wagner et al., 2019) to inform our longitudinal, participatory research project with teachers, administrators, community members, youth, and families. We are motivated by the fact that the opportunities that students from minoritized groups have for learning mathematics are often diminished as compared to their majority group peers due to systemic and institutional issues (Barwell et al., 2007; Civil, 2012; Le Roux, 2016; Meaney et al., 2011; Valoyes-Chávez & Martin, 2016). Over time, our partnership will develop strength-based pedagogies based on positive, asset-based storylines. In this paper, we analyze in-depth interviews with nine Norwegian principals and share some of their complex storylines about minoritized student groups, their languages and their learning of mathematics.

Positioning Theory and Storylines

The key construct we use for this paper, the idea of storylines or "lived stories for which told stories already exist" (Harré, 2012, p. 198), comes from positioning theory. As Davies and Harré (1999) point out, the multiple storylines at play "are organized through conversations around various poles, such as events, characters, and moral dilemmas. Cultural stereotypes like nurse/patient, conductor/orchestra, mother/son may be called on as a resource. It is important to remember that these cultural resources may be understood differently by different people." (p. 39). Storylines are negotiable; they are reciprocal and contingent (Wagner & Herbel-Eisenmann, 2009). Storylines also can occur at a range of scales (Herbel-Eisenmann, et al., 2015). Although positioning theory has been used in mathematics education research for over a decade, there is typically less focus on storylines than on positionings. Because storylines indicate what is expected in an interaction and can shape the potential fluid roles or positions that are made available to people, they are important to consider in relationship to mathematics teaching and learning.

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Methodology

Context

This research is part of the Norwegian Research Council's FINNUT-granted project MIM: Mathematics Education in Indigenous and Migrational contexts: Storylines, Cultures and Strength-Based Pedagogies, (see https://www.usn.no/mim), a collaboration drawing on participatory approaches to investigate educational possibilities and desires, in times of societal changes and movements. Although we focus on the Norwegian context, we recognize that these kinds of societal changes and movements impact many countries throughout the world. With these changes and movements of people, language diversity may be the most obvious challenge in mathematics classrooms, but this reality also connects to cultural differences and conventional characteristics of the discipline. Indigenous communities have experienced linguistic and other challenges for decades as a result of colonization. In Norwegian contexts, several groups with a different origin than Norwegian are recognized, often with a reference to a connection to a (former) nation state. These groups are mainly seen mentioned from the 1970s and onwards when migrant workers from Pakistan, Turkey, and Morocco started to arrive in Norway. More recently immigration also comprises people from other European countries and from conflict areas in, for example, Asia and Africa (Reisel, Hermansen & Kindt, 2019). In addition to these, there are peoples/nations of Norway (without their own nation state) that appear in the contexts we are interested in; the Kven and Sami peoples belonging to the northern part of Norway. The schools in which we have partnerships are in both the northern and southern parts of Norway. Principals in northern Norway are expected to provide mathematics education in Sami, and sometimes in endangered languages such as Kven. In some of the further north communities, and in the principals' schools in the south, there are a high number of migrated youth who have arrived in the last decade and hence are not (yet) proficient in the main language of instruction, Norwegian.

Methods

Between August 2021 and now, we have been working together with people in five schools. As part of this work we did In-depth interviews with nine principals in our collaborating schools in Norway. Each interview involved two people from our university-based team and one school principal and took place on Zoom. The interviews were recorded, then transcribed in Norwegian and were also translated into English. We independently read each interview multiple times and took notes on the range of ways Indigenous and (newly) migrated students, families, and teachers were positioned in the episodes and tried to identify the kinds of storylines that were at play. We then met and shared the storylines we had identified and evidence for that storyline and, after discussion, came to consensus on a set of storylines to report. As Wagner and Herbel-Eisenmann (2009) have pointed out, there is not a 'correct' way to name a storyline because each participant's perspective may be different. Thus, we drew on the context of the interview, information we knew about the school and community, and the educational, historical, and political context of the specific country to consider how to name the storylines.

Results

In the data material from conversations with principals focusing on Norwegian minoritized youth and their mathematics education, we found a number of storylines, Here we share two larger intertwining storylines, with both supporting and contradicting "smaller" storylines in the conversations. We found that the main storylines were similar from schools in different geographical and socioeconomic areas in Norway. How the principals developed and talked about the storylines, however, differed geographically, with an emphasis on the particular communities in their areas. In this section, we elaborate on the two overarching storylines: "Mother tongue

teachers are important resources" and "Students don't (yet) have the basic language skills to build their mathematics language" in separate sections while acknowledging that they intertwine and sometimes overlap each other.

Mother tongue teachers are important resources

The overarching storyline that all principals address is their concerns for giving students the best opportunities to learn mathematics. The principals talked about how they strive to find support for students who do not (yet) know the language of instruction (Norwegian) or try to ensure teachers can teach or support in the classrooms in languages other than Norwegian. Depending on the geographical area, however, the principal's way of talking about this storyline differed.

In the Northern context, the principals are obliged to offer education in the minoritised languages, as Sami and Kven. In addition, a number of the parents from indigenous communities want to protect and revitalize their languages and hence wants these languages to be the language of instruction for their children in schools. There are also a number of parents, however, who want their children to learn and know mathematics in Norwegian because this will support the students' further university studies. In addition, it is very difficult to find teachers who can teach mathematics in Sami and/or Kven. Teachers who are both educated in mathematics teaching, and know the Sami language are rare, if they even exist. The challenges are complex and contradictory.

In southern Norway, there are a higher number of minoritised student groups due to recent migrations. A high number of youth came to Norway as refugees, or in families who arrived in Norway for work. These students are usually offered to participate in a "mottagsklasse", a "welcome/arrival class", in schools where these exist. In these classes, they together get accustomed to the school, learn Norwegian and learn subjects such as mathematics even if they are of different ages and are on different learning levels in the subjects. After one year, the students are dispersed in, what is described as "ordinary" classrooms where children are in the same age groups despite knowledge levels. Principals do not talk about these "welcome/arrival classrooms" as ordinary: they are "special" classrooms, in some schools, where the students go one year.

A storyline about the latest arrived students is that it is hard for them to learn mathematics because they do not (yet) know the language of instruction, and the teachers—mainly Norwegian—do not know the students' languages. As one principal said, "they get lost in translation and it goes both ways". The principals talked about wanting to employ a higher number of mathematics teachers with migrational background, to teach in these classes. Another option they suggested would be to have mother tongue teachers present in the classrooms.

Students don't (yet) have the basic language skills to build their mathematics language

This storyline is shared by principals both in the north and south of Norway, however, with different explanations. The storyline addresses minoritised students who do not have sufficient language skills either in their mother tongue language or in Norwegian. These students may be second or third generation migrants, who heard and talked Norwegian only in day care (for example kindergarten and preschool) and then during school hours only. At home, they speak a "modified", or "adjusted" mother tongue language, mostly lost due to parents, grandparents and/or siblings not being fully exposed to this language while living in Norway over time. The principals talk about these students as having extra challenges as they do not have enough language skills to build a mathematical language in either of their languages.

In the north, the challenges with this storyline are experienced in the same vein, however, the reasons for the storyline are different. The reasons here concern either endangered languages (for example Kven) but also generations that have lost their indigenous languages due to being forced to speak Norwegian during "fornorsksningsperioden". In other words, families have "lost their

heart language" (mistat hjärtespråket sitt) (Broch Johansen, 2020). The situations are complex, and we here give two examples: If the children have been exposed to, for example, Sami, during kindergarten, pre-school and the early years, and/or at home, then they might not know the basic mathematical concepts in Norwegian when they move to secondary school where they switch language to Norwegian as language of instruction. Or, conversely, a student may have attended an early education in Norwegian, and then moved to a secondary school where they may learn mathematics in Sami. Or they were exposed to the indigenous languages in the early years of schooling, but at home they speak Norwegian only. In these cases and according to this storyline, as a minoritised youth, they get caught in the structures and do not have sufficient language skills in any language to build their mathematical language skills. For the principals, the impact and complexities of this storyline becomes an ethical dilemma.

Discussion

We are sharing here our early interpretations about the interviews with principals. In the presentation we will have translated transcripts to share, which will help us illustrate the complexities of these storylines. We recognize that some of these storylines also appear in first attempts to gather international data related to understanding school policies and principals' acknowledgement of difference and strategies that assist or deny access to schools for all children. For example, Goddard (2007) reported that "the issue of adequate funding for interpreters is present in many countries, as is the practice—albeit contested by some—of using children to interpret for their parents" (p. 4). Providing financial resources for mother tongue teachers in schools would be a systemic approach to supporting language for newly arrive immigrants and Indigenous students. Alternatively, resources could be provided that would educate a higher number of teachers with migrational backgrounds to become educators.

In Sweden, Johansson, et al. (2007) reported mixed messages from principals and teachers about the kinds of responses and attitudes to the increasing school diversity. Alongside valuing diversity for how it enriched the school community, for example, was associations with problems of "language difficulties, social programs, support programmes…[and needs of] special support" (p. 26). One of the complexities for us relates to our desire to avoid perpetuating deficit framing of students and cultures. When we identify storylines that pervade education discourse, deficit-framed storylines exist. We struggle to find ways of reporting on these storylines to research and professional education communities while making it clear that we see them as problematic. We also acknowledge that other storylines we have found have centered on individuals rather than systems or structures that need to change (Andersson, et al., 2021; Ryan, et al., 2021). An additional complexity in our work relates to the pandemic and its influence on our research plan. Although we planned to foreground the experiences of minoritized children in Norwegian mathematics classrooms, the pandemic's restrictions on face-to-face interaction forced us to talk with principals before talking with students. We consider this arrangement less than ideal for research drawing on participatory methodology that focuses on classroom opportunities.

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