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A mathematics teacher's respectful listening in a culturally diverse class

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ABSTRACT

Respect and listening are two issues that are complicated to research. This paper presents how respectful listening may constitute one aspect of a teacher's role in child-centered learning. The analysis focus on a teacher's reflections about events that took place after she and a colleague carried out a mathematics teaching unit on culturally diverse children's understanding of 'pattern'. The teacher observed situations that she found interesting and relevant for the children's learning. She communicated with the researcher about this for some months. A closer look at the teacher's reflections caused the research focus to change from what the teacher observed, to how she carried out the observations. So, the research focus is the teacher's application of respectful listening skills when these observations were made. Our analysis reveals the outcomes of two situations. Situation 1 is about communication between the teacher and a child's mother, while situation 2 is about communication between the teacher and a child.

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Introduction

According to UNESCO's (2005) framework for peace education, "[i]t would be necessary to change the teacher-centered classroom approach to child-cetered learning' (17). Critical mathematics education is an answer to this need for change, because in critical mathematics education, it is important to consider the interests, expectations, hopes, aspirations, and motives of the students (Skovsmose 2020). The goals of the critical mathematics education movement require attention to culture, which includes being aware of the students' own ways of relating to the cultural groups that they find themselves in (Larvor and François 2018). Our paper presents how a teacher communicated with children and parents after a mathematics teaching unit in which children with culturally diverse backgrounds brought cultural items from their home cultures.

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UNESCO (2008) states, '[t]wo fundamental concepts of peace education are respect and skills' (3). Munter, McKinley, and Sarabia (2012) underline the need for redefining identity in the teacher–student relationship for peace education. Their perspective of teachers as peace educators focuses on listening, caring, being non-judgmental, and engaging in reflective practice. Hintz and Tyson (2015) point out that whereas most literature on discussion focuses on speaking, the study of listening offers an examination of language from a different perspective.

Skovsmose (2006) worries about the amount of mathematics education research based in *prototype mathematics classrooms* – to what extent the prototype classroom may become a defining element for research paradigms in mathematics education. In a non-prototype classroom, there are parents who do not speak the majority language well enough to help children with their homework. A non-prototype classroom could a) be in a poor neighborhood, b) include a large number of students or c) as in our case, be located in a cultural setting that would be categorized as 'foreign' according to norms in the mathematics education paradigm. Skovsmose points out that much of mathematics education research is biased, because it has been developed with reference to prototype classrooms only. Therefore, the theories are not necessarily relevant or valid in non-prototype classrooms. Our study aims to contribute to non-prototype mathematics classroom research. The study provides an analysis of a) a primary school teacher's application of listening skills and b) how her behavior was respectful. The research question is: How does a teacher's respectful listening support a culture of peace in a culturally diverse mathematics classroom?

Our study aims to describe how respectful listening may constitute one aspect of the teacher's role in child-centered learning. The analysis provides detailed insight into two situations that took place after a teaching unit; Situation 1 presents the communication between the teacher and a mother, and Situation 2 presents the communication between the teacher and a child.

Background

In inquiry-based mathematics education, autonomy and responsibility are granted to students, while the teacher plays a guiding role (Dorier and Maass 2020; Artigue and Blomhøj 2013). This is an example of child-centered teaching. Our study is part of a larger research project about inquiry-based mathematics education. Fyhn and Hansen (2019) examined (Indigenous) Sámi[1] children's investigations of patterns in different contexts. Two other teachers at the same school volunteered to participate in a follow up study two years later. Children with culturally diverse backgrounds investigated patterns in items from their home cultures in a two-day teaching unit.

The teachers in both studies aimed at valuing the children's home cultures in order to build connections between children's experiences within and outside of school. They wanted the children to show pride in their home cultures.

Yaro, Amoah, and Wagner (2020) draw attention to the possibilities of creating mathematics tasks for peace and sustainability and they warn against the conservative force of the textbook. They argue that a school-year-long professional development program could engage teachers in reflection on their practices. Our study presents one teacher's reflections about events that she experienced, while her school participated in a research project where no textbooks were used.

Culture related patterns in school mathematics

Inviting children to bring items from their home cultures to school is in line with the idea of culturally responsive teaching. According to Greer and Mukhopadyay (2012), striving towards culturally responsive mathematics teaching means centering the perspective of mathematics as a human activity, embedded in human culture. They suggest that the alienation that many children and adults feel towards mathematics is partly the result of the lack of connections between their experiences within mathematics classrooms and outside of school settings. Norway's Core Curriculum (KD 2017) also underlines the importance of school support in children's development of their cultural understanding. This curriculum emphasizes that a good society is founded on the ideals of inclusiveness and diversity.

After Grade 2, Norwegian children shall be able to recognize and describe patterns' repeating units and create their own patterns (KD 2019). Thus, investigations of 'pattern' in the early primary years is central in Norwegian mathematics education. However, the word 'pattern' cannot be translated into one single word in some languages. For instance, Sámi languages need to use at least four words to cover the meaning of 'pattern' (Fyhn and Hansen 2019). Patterns are related to culture, people around the world use different symmetric patterns as symbols (Lipka et al. 2019; Dunfjeld 2001/2006). Inviting the children to bring patterns from their home cultures to the mathematics classroom might allow for new approaches to children's mathematical thinking.

Context

The study took place in a municipality, which is located in northern Scandinavia at 70 degrees north. The municipality is close to Finland and Russia. The principal livelihoods in this area are reindeer herding, farming, and fishery. Throughout history, the area has been multicultural. During the 16th century, people in this area paid taxes to Norway, Sweden, and Russia due to their rich natural resources (Aarseth 1989). The municipality, like a dozen

other Norwegian municipalities, has two official names: one Sámi name and one Norwegian name. Around 1/3 of the students at the local school choose Sámi as their first language in school (Rasmussen 2018). We consider that schools where a significant proportion of the students are Indigenous are non-prototype.

Compared to southern Norway, the municipality is rural. The population is approximately 1000 within a land area of around 1500 km^2 (SSB 2020), a population density of less than one inhabitant per km^2. Comparably, the area of Singapore is 705 km^2, which is approximately half the size.

The school is a mixed age school that has two classes at each grade level; one class where Sámi is the primary language of instruction and one class where Norwegian is the primary language. This classifies the school as bilingual. The teachers' break room is a bilingual area; some teachers communicate in Sámi while others communicate in Norwegian. However, in classes where Norwegian is the primary language, most children do not speak Norwegian as their mother tongue.

Theoretical grounding and literature review

We draw on a range of different theoretical perspectives in this study. We present perspectives on mathematics and mathematics education, in order to situate our research within the current field of mathematics education. The two sections *respect* and *listening skills* are included, because 'respectful actions' and 'listening skills' frame the analysis.

Perspectives of mathematics

D'Ambrosio (2007) claims that to achieve a world in peace, mathematicians and mathematics educators have a special responsibility – to carefully promote citizenship transmitting values and demonstrate rights and responsibilities in society.

> We do not want our students to become bright scientists creating new weaponry and instruments of oppression and inequity … We do not want our students to become citizens who obey and accept rules and codes which violate human dignity (26).

Frankenstein (1983) introduced the concept of critical mathematics education based on the philosopher Freire's work. The purpose is to expand the limited scope of mathematics as neutral, value-free, and objective knowledge, and to provide an alternative to the idea that mathematical knowledge exists independent of how humans use it. According to Skovsmose and Borba (2004), critical mathematics education is concerned with social and political aspects of the learning of mathematics. It is concerned with the life in the classroom, it is

concerned with providing access to mathematical ideas to everybody independent of gender, class, and color of skin, and it is concerned with the development of critical citizenship.

Lerman and Zevenbergen (2004) view mathematics classrooms as cultural representations that are more or less accessible to students, based on their cultural and social backgrounds. Ability to participate in these classrooms depends on the students' knowledge of the classroom culture. When the mathematics teacher aims to value items that students in a multicultural class choose to bring from home, the teacher invites the students to participate in creating the cultural representations that constitute their mathematics classroom.

D'Ambrosio (1985) introduced the term *ethnomathematics* as a broad conceptualization of mathematics. Ethnomathematics allows us to integrate several practices that are essentially mathematical in their nature. This broader perspective of ethnomathematics has inspired our study. D'Ambrosio (1985) reminds us, 'that colonialism grew together in a symbiotic relationship with modern science, in particular with mathematics, and technology' (47). The evolution of mathematics is intimately related to the evolution of Western society (D'Ambrosio 1998). Hence, mathematics cannot be dissociated from human behavior. Bishop (1988) sees mathematics as a cultural product, as outcomes of human activity. Harber and Sakade (2009) challenge the idea of authoritarian schooling where the focus is on certainty and a single 'right' answer. They claim that this strong focus on truth and reason stems from European culture at the end of the eighteenth century, the period of the 'enlightenment', when the aim was to formulate general laws based on observation and experiments.

A person's background consists of events that have taken place, while the foreground is events that might take place (Skovsmose 2005). A person's background can be seen as a determining factor for her/his foreground – to some extent, the background frames the foreground. The foreground is important for understanding a person's intentions and actions. A refugee might see the new country as central in her or his foreground, while a bombed home country belongs to a frightening background. In situations like that, the background can differ from the foreground. Providing access to mathematical ideas for all, means that the teacher treats this issue with care.

Respect

Regarding peace education, respect refers to the development of respect for self and for others (UNESCO 2008). According to Fraser (2000), members of misrecognized groups can gain the respect and esteem of society by contesting the dominant culture's demeaning picture of the group. She explains that to be misrecognized is not simply to be thought ill of, looked down upon or devalued

in others' attitudes, beliefs, or representations. It is rather to be denied the status of a full partner in social interactions as a consequence of institutionalized patterns of cultural value that constitute one as comparatively unworthy of respect or esteem.

Regarding the ethical dimension of mathematics education, D'Ambrosio (2007) points out that it is our duty to cooperate, with respect and solidarity, with other human beings. The essence of the ethics of diversity is respect for, solidarity with, and cooperation with 'the other' (the different). This leads to quality of life and dignity for all. However, respectful behavior is a cultural phenomenon, it is not universal. Bongo (2012) provides examples of how Sámi respectful behavior differs from respectful behavior in a Norwegian context. For instance, if you follow your visitors to the door when they leave, you are polite in a Norwegian context, but in a Sámi context, this may be interpreted as you are chasing your guests to the door.

Burns, Lyons, and Niens (2017) studied children's respect for diversity in a multicultural society in Northern Ireland. They identified four actions that show respectful behavior: i) attention, ii) offering time, iii) equality of treatment, and iv) acts of solidarity. *Attention* means more than just paying attention, it means showing a genuine curiosity about other traditions and cultures. The second action, *offering time* means spending time with others, including playing together and explaining new things. These four actions might be interpreted differently in a Sámi context than in Southern Norway's more urban areas. Showing genuine curiosity about other traditions and cultures can be a very direct behavior, which according to Bongo (2012) is disrespectful in Sámi contexts. An indirect approach to showing genuine curiosity requires listening skills and the offering of time.

Listening skills

The importance of active listening in peace education is pointed out by Munter, McKinley, and Sarabia (2012) in their study of a teacher near the US-Mexican border. 'Above and beyond all, however, the real key is learning how to listen, how to care, how to be nonjudgmental, and to be reflective' (61). Stewart and Thomas (1995) use the term 'dialogic listening'; listening dialogically involves focusing on what you share with the persons you are talking with. According to Lynch (2010), listening per se is hard work and even in one's first language one may encounter difficulties in understanding speech. Regarding listening to second language, one faces additional problems. Lynch further points out that conducting research into listening is complicated, because listening rarely has an observable product.

There is not much research on teachers' listening in mathematics education. Davis (1997) presents a framework for teachers' listening. Communication is categorized as either under the teacher's control or under the students' control.

Inquiry-based mathematics is categorized as student-controlled communication: here the students are able to explore a mathematical issue rather than attempting to master already formulated bits of knowledge. Empson and Jacobs (2008) present a framework for teachers' listening in traditional teaching settings where communication is teacher controlled. Neumann (2014) shows how one teacher supports students' consciousness about their mathematical strategies and ideas, while Doerr (2006) examines one teacher's listening skills in the context of students' engagement with a modelling task.

In student-centered mathematics teaching, teachers' listening is necessary for being able to analyze and understand students' thinking (Prediger 2010). Hunter et al. (2018) study the development of mathematical inquiry communities. They claim that listening and noticing 'supports the teacher to reposition students to access a group's reasoning and press for students to engage in deeper reasoning' (30).

The linguist Rost (1990) presents a skill taxonomy for characterizing listening abilities in language learning, based on the three categories *perception, interpretation*, and *enacting*. Each category includes several sub-skills; some of these are listed below. *Perception* includes sub-skills of perceiving and discriminating sounds in isolated word forms, identifying use of stress and pitch in connected speech, and adapting to speaker variation. *Interpretation* includes sub-skills of deducing the meaning of unfamiliar lexical items, filling in ellipted information and recognizing indicators of discourse for introducing an idea, clarification, or changing topic. *Enacting* includes sub-skills of selecting salient points from information given for use in a task, identifying needed clarifications of topics and ideas, and providing appropriate feedback to the speaker.

Listener experience is central to achieving the sub-skills of *perception* and *interpretation*, because such skills cannot be achieved through literature studies alone. Hanson (1958) explains in detail how what you *perceive* is closely related to your experience.

> We may not hear that the oboe is out of tune, though this will be painfully obvious to the trained musician. (Who, incidentally, will not hear the tones and interpret them as being out of tune, but will simply hear the oboe to be out of tune.) (17)

In order to deduce the meaning of unfamiliar lexical items, the listener will benefit from a register of choices as well as from association skills. Providing appropriate feedback to the speaker is a skill that develop through experience and exercise. The listener's sub-skills of listening are influenced by her *attention*. By attention, we mean a genuine curiosity about other traditions and cultures, demonstrated by applying listening skills and offering time, as explained in the previous section about respect.

Method

This study analyses a primary school teacher's reflections about two situations that took place after she and a colleague had carried out a teaching unit about patterns from the children's home cultures. Bess teaches primary school and Clara teaches 'kindergarten' [Norwegian: barnehage] for 5-year-old children. After a teaching unit, teacher Bess observed situations that she found interesting and relevant for the teaching focus. This resulted in communication between her and the researcher for some months. A closer look at the teacher's reflections caused the research focus to change from what the teacher observed, to her application of respectful listening skills in the situations where the observations were made.

The class

Bess and Clara's group included fourteen 5–7-year-old children from kindergarten and school. The cultural setting in this classroom included a mixture of Indigenous, Norwegian, and immigrant children. Some of the children did not speak Norwegian at home and almost half of the group lived in bilingual homes. They spoke a total of eight different languages. The parents had eight different mother tongues, including North Sámi and Norwegian, and many of them were not fluent in Norwegian. The cultural setting combined with the municipality's very low population density caused the classroom to be categorized as non-prototype.

By the ages of 6–8 years old, children have developed an understanding of different ethnic groups and cultural backgrounds. Regarding children of this age, Divrengi and Aktan (2011) claim that as their understanding of events in time and place increases, their ability to identify tendencies towards discriminatory behavior related to ethnicity and cultural background is enhanced. Most influential are the children's observations of the world around them. Another important factor in this age range is the children's incipient development of self-respect in relation to culture. Consequently, the children who participated in the teaching unit are within the age range where classroom activities can increase their self-respect in relation to their home culture.

The teaching unit

The first day the teachers set the scene by focusing on properties of patterns and what constitutes a repeating pattern. The children painted patterns and created their own patterns using building blocks and other classroom materials. Bess and Clara decided that the children would present patterned items from home the second day of the teaching unit. They postulated that this could highlight children's cultural backgrounds in a positive way. The teachers did not control what items the students would bring and thus, they could not predict

the children's argumentation for why and how the items were patterned. The children brought a variety of items, mainly items from home: a striped t-shirt, a dress covered with butterflies, a potholder with a pattern of arrows, a Palestinian scarf, Sámi fur shoes with traditional patterns around the ankle, and so on.

Three days after the teaching unit, Bess sent the researcher Anne some SMS and MMS messages where she informed that they had continued working with pattern, and what they had done. This was the teacher's initiative.

Teacher as co-writer

Bess was invited to co-write this paper because she is the source of the data. Asking the teacher to co-write the paper is a way of respecting her knowledge and co-writing is cooperation. According to D'Ambrosio (2007), respect and cooperation are components of the ethics of diversity. In addition, there is a risk of misinterpretation if the researcher does the analysis without the teacher's participation.

Some weeks after the teaching unit, during the Covid19 lock down in March 2020, Bess contacted the parents. Among other things, these conversations included 'pattern'. After Bess had informed about the conversations' content, the researcher started paying attention to Bess' communication skills. A closer look at the reflections showed that the way Bess' observations were done was worth a study. Thus, the research focus changed from the content of Bess' observations to how these observations were done. Early in the following school year, Anne invited Bess to co-write a journal paper about how her listening skills appeared in her reflections.

The research focus

Because most of the children have diverse cultural and linguistic backgrounds and their parents are second language learners of Norwegian, we found it appropriate to include a framework that is developed for language learning in order to analyze the teacher's communication.

The teacher Bess' reflections are analyzed by a framework of Burns, Lyons, and Niens' (2017) actions of respectful behavior together with Rost's (1990) categories of listening skills. The teacher's actions are categorized as *attention, offering time, equality of treatment*, or *acts of solidarity*, and the teacher's listening skills are categorized as *perception, interpretation*, or *enacting*. As Bongo (2012) explains, respectful behavior is culture related. This means that listening skills constitute a crucial part of the teacher's respectful actions. The school is located in a rural area where Sámi and Norwegian cultures have existed together for hundreds of years. Bess grew up in a similar society and she has been living for decades where she lives

Figure 1. Teacher Clara wearing a 'malong' in front of the class. (Photo: Anne Birgitte Fyhn).

now. Her background gives reasons to believe that her *respectful behavior* is in line with the local culture(s). We have no data on how children and parents who come from abroad have adapted to the local Norwegian culture(s).

The two situations

Two different situations that took place after the teaching unit, are chosen for our study. Both situations provide information about a) learning and b) the teacher's listening. Situation 1 is the communication between Bess and one mother who misinterpreted the Norwegian word for 'pattern' in a phone call discussion. This mother learned Norwegian as an adult. The phone call took place two months after the teaching unit. Situation 2 is the communication between Bess and a student who, according to the two teachers, struggled with

grasping the idea of 'pattern' during the teaching unit. This student brought a Filipino 'malong' (Figure 1) to the class and she continued working with the concept of 'pattern' on her own after the teaching unit was finished.

Data collection and analysis

Bess sent the researcher an SMS two days after the teaching unit, with information of how they proceeded with the pattern work. Some weeks later, she phonecalled the parents. Among other things, the parents who were not from Norway were asked questions about 'patterns'. Some days after this, Bess and Anne communicated by e-mail. Five months after the teaching unit, just after the conclusion of the spring term, Anne interviewed Bess in a phone call. Here Bess discussed her reflections regarding the teaching unit and her further work with patterns. Bess also sent an e-mail to Anne in October with reflections related to this work.

Data were collected over the course of ten months and consist of audio recordings of the interview with Bess in June, Bess' typed notes from communication with parents in March, two SMS messages from Bess in January, one SMS in June, and one e-mail from Bess in October. The researcher's hand-written notes from the teaching unit are used as supporting material. The data were originally collected to reveal the children's development of 'pattern', but it turned out that they also provided information about how the teacher's observations were done. The interview questions are part of these data and thus they have varying relevance to our study:

(1) You added two 'new' issues [in the teaching unit] that were not included in the previous study: a) the children brought patterned items from home and b) The bird dance song. What were your reasons for doing this?
(2) After the teaching unit, you said that it was more time consuming than expected.
(3) Do you know words for *pattern* in any of the other children's languages?
(4) One child said he could read the letters on a Palestinian scarf. Do you think this could be brought into a future discussion about the Arabic numbers we use today?
(5) School – home cooperation. How do you think bringing items from home might influence the children? Did you experience any reactions from the parents?
(6) Did you experience that any of the children were able to transfer knowledge of patterns from one area to another?

The analysis was carried out by systematically identifying respectful actions and listening skills in the transcribed interview. Some replies were not relevant for this study. For instance, the teacher replied to question 4, that this was something she had not thought of before. The two teachers showed an action of respect by *offering time*; time is a limited resource for mathematics teachers and here they offer time for the children's home cultures in the mathematics lessons. This example (*offering time*) did not concern any examples of listening.

According to Bess' notes, two families did not reply when she telephoned all families in March about patterns. Bess believes that these families' children are fluent in their parent's mother tongues. At the time of her next conversation with these families, she forgot to ask about pattern. This is an example of poor listening; these parents lost the opportunity to participate because they did not answer the phone when Bess called. However, these notes also show the teacher's honesty.

Ethical considerations

The two mothers involved in these situations have read through the parts of the text that concern them and their family members. One mother read a two-column document with a Norwegian translated version of the text next to the English version. The other read the English version. They have given informed consent to our publication of this article. We decided to anonymize the name of the municipality and the area, in order to anonymize the participants.

Analysis and findings

The analysis reveals the teacher's respect and listening skills in communication with parents and with students. We present two situations, a) her communication with a parent and b) her communication with one of the students.

Communication between the teacher and the parents

A few days before the teaching unit was carried out, all parents received a written note with information about the lessons. The note explained that the children should bring something patterned to school, emphasizing that the items could include patterns from different countries.

> Bess: It was that we wanted patterns from the children's home countries – those who do not come from traditional Norwegian homes but come from bilingual homes or have a different culture. (Transcript from interview, 23 June 2020, author's translation)

This is interpreted to be what Burns, Lyons, and Niens (2017) call *attention*; the teachers showed genuine curiosity about children's home cultures. The children were invited to bring something from home, and Bess' behavior was indirect. This is also the action of respect called *equality of treatment*; each child was offered an equal amount of attention, and everyone was included.

When Bess contacted parents with non-Norwegian backgrounds during the first Covid19 lockdown week, she included 'pattern' in the themes she was discussing. She wanted to know ' . . . whether mother knows/remembers the word for "pattern" in her mother tongue – and whether there are more words for pattern in her mother tongue.' (teacher's notes, March 2020, author's translation). Bess knew from Fyhn and Hansen's (2019) study that several Sámi words were necessary to cover the meaning of 'pattern', thus, she wanted to know what words were used for 'pattern' in her students' mother tongues. She was paying *attention* to the parents' mother tongues, and she was *offering time* for the parents to tell about these words. This was an *act of solidarity*; Bess acknowledged the parents' knowledge about their home cultures. 'I wanted to communicate to the parents that their background and mother tongue is important, something we do not always manage to do every day' (teacher's notes, March 2020, author's translation). This use of *attention, offering time* and *act of solidarity* is categorized as three of the respectful actions described by Burns, Lyons, and Niens (2017).

Situation 1: The mother who misinterpreted a Norwegian word

We describe the teacher's listening skills in a situation where there was considerable potential for misinterpretations. One mother with non-European background, misunderstood Bess' question about the word 'pattern' ('mønster' in Norwegian). The mother's reply was about ghosts, which appear at cemeteries ('monster' in Norwegian). Bess realized that they were definitely not talking about the same thing. She applied two actions of respect (Burns, Lyons, and Niens 2017); she paid *attention* to what happened and *offered time* to communicate with the mother.

Bess applied her listening skills related to *interpretation* (Rost 1990) and realized that there was likely a misunderstanding. Later that day the mother sent Bess an SMS message. Bess said 'I had to telephone her again later and then I said m-ø-ø-ønster. I had to talk with the daughter' (transcript from interview, 23 June 2020, author's translation). This shows how Bess cooperated with the mother; the mother knew that Bess was *offering time* (Burns, Lyons, and Niens 2017) for her and thus she sent the teacher an SMS. Bess listened to the mother. When she could not understand, they waited for the daughter to arrive home. This is an example of *enacting* (Rost 1990). Bess refers to this situation in her notes too

> We realize that we do not quite understand each other. When her daughter arrives home, mother calls back to me. I talk with the daughter and tell her to show a pattern to her mother. I can hear the daughter say, "Yes, but mother, there is pattern [mønster] on your tights! The daughter continues, there … and there … is pattern. Mother laughs. «Oh, yes, monster … I thought you wanted words for monster." The words become very alike when she says them. (teacher's notes, March 2020, author's translation)

The Norwegian letter or sound 'Ø' is challenging to pronounce for many foreigners. Bess *perceived* (Rost 1990) the mother's pronunciation of the two Norwegian words 'monster' [monster] and 'mønster' [pattern] which sounded quite alike, even though the mother had lived in Norway for several years. Bess' knowledge about second language learners includes foreigners' challenges when they try to pronounce the Norwegian 'Ø'. The mother misinterpreted what Bess said because the Norwegian sound 'Ø' is challenging for foreigners, not because of a restricted Norwegian vocabulary. This example shows the importance of the teacher's listening skills.

When Bess and the mother realized there was a communication problem, Bess' ad hoc solution was an action of respect (Burns, Lyons, and Niens 2017); she *offered time* to wait for the daughter to come home. The daughter then had an opportunity to demonstrate her understanding of the mathematics she was learning at school to both her mother and to the teacher; she applied her knowledge of 'pattern' in a new context. The teacher solved the communication problem by creating a situation where the child was explaining, and the teacher was listening. Bess acted respectfully by *offering time* for the daughter and her mother to discuss this strange situation, while she was listening.

Bess wrote, 'After our conversation, she [the mother] sent me an SMS with one word for stripes on a dress and one word for t-shirt with flowers' (teacher's notes, March 2020, author's translation). She came up with two different words for 'pattern' in her mother tongue and thus, she made her knowledge about 'pattern' visible to Bess. The SMS messages show that the mother was expecting the teacher to pay *attention* and *offer time* to read her messages; she expected respect. Five months later, the mother still remembered this conversation in a positive way

> Just after school started this fall, [this] mother came smiling over to me and started talking about monster and mønster. My learning from this is that because sounds can be experienced very much alike, you can misunderstand words. Both of us learned something. (teacher's e-mail, 2 October 2020, author's translation)

This is an example of what Burns, Lyons, and Niens (2017) call *equality of treatment*. The teacher and the mother were treating others the way they wanted to be treated; they both listened with care. Bess emphasized the importance of the listening skills *perception* and *interpretation* (Rost 1990).

Communication between the teacher and the students

Bess' behavior in the classroom is in line with Burns, Lyons, and Niens (2017) actions of respect for diversity; she *offered time* for the children to present their home cultures in the mathematics lessons and her genuine interest and curiosity towards the children's home cultures is categorized as *attention*.

> But the students are completely aware that they know another language. They express pride when they for instance are counting in front of the class. (teacher's notes, March 2020, author's translation)

'Counting in front of the class' is an activity that was introduced through the school's ongoing research project. The children's work with numbers includes counting in different languages. Each child counted to ten in their mother tongue in front of the class and the other children tried to learn some of these numerals. Here Bess applies the listening skill Rost (1990) call *interpretation*; she listens with care and interprets that the children express pride. In the interview at the end of the term, Bess pointed out that it is important for teachers to value children's backgrounds. She referred to a boy whose parents come from a country with a large proportion of Muslims.

> Bess: … seeing that 'My background has value' and talking about this in school. I remember that when we worked with Islam, this boy was very proud. He could tell things … he knew about those things. (Transcript from interview, 23 June 2020, author's translation)

In this situation, the boy was given opportunities to show pride in his background. This is categorized as the respectful action *acts for solidarity*. Islam is not part of the majority culture in Norway and Bess offered the boy an opportunity to share his home culture with the rest of his class.

Situation 2: The girl with the 'malong'

One student brought a 'malong', a traditional Filipino garment, for the teaching unit. The 'malong' is used by members of ethnic groups in Mindanao and southern parts of the Sulu Archipelago. Traditionally, the 'malong' is handwoven, with patterns distinctive to particular ethnic groups. Modern 'malongs' are usually machine-made or imported, with patterns that mimic the traditional local designs (wikipedia 2020). Figure 1 shows teacher Clara wearing the 'malong' while the student presented it to the class. Beforehand, the child's mother showed and explained to the teachers how to put on and wear the 'malong', while the student watched. During the interview, Anne asked Bess about her experiences with how showing the 'malong' at school influenced the child

> Bess: I could see that she was wide-eyed when the mother showed it to me in the corridor [before the lesson started] - how to put it on Clara. She [the girl] was standing there tiptoeing around us. That [the 'malong'] was what she had brought. (Transcript from interview, 23 June 2020)

When the student presented the 'malong' to the class, she did not say or demonstrate anything that was interpreted as knowledge about 'pattern', but she referred to colors and items in the 'malong'. She told the audience the name of the 'malong', what it is used for, and then she said that she is related to the 'malong':

> Girl: Colors. – Pink, blue, – and, (pointing) flowers here. This one is bigger.
>
> Teacher: What is blue, pink?
>
> Girl: (pointing without talking)
>
> Teacher: Where does it come from?
>
> Girl: Philippines. 'malong'. Used for dressing up. I am from Philippines too. (researcher's notes, 7 January 2020, author's translation)

When the student listed the colors blue, pink, and added flowers, her utterance could be interpreted to mean that she listed items that she thought would constitute components of a pattern. However, it could also simply be a narrative about what the 'malong' looks like. The teacher used her listening skills and

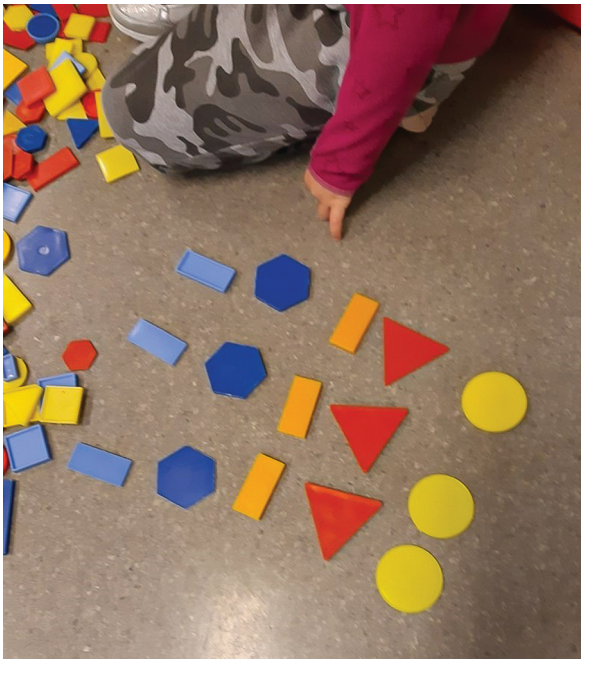

Figure 2. The girl's repeating pattern made by plastic shapes. (Photo: Gladys Berntsen).

interpreted what the student said about elements of the 'malong' and enacted by asking for clarification of the girl's ideas; 'What is blue, pink?' The student had no verbal reply, and then the teacher turned the focus to the origin of the 'malong' by asking where it comes from. This question is categorized as the respectful action *attention*; the teacher asked a question to learn about the student's home culture and she was listening to the student's reply. The student informed about what the 'malong' is used for and how it is related to herself.

The teachers doubted that this student grasped what constitutes a 'pattern' that day. However, the patterns on this 'malong' is complex; it is not easy to find a repeating unit in it. Two days later, Bess sent an SMS to Anne where she informed that they had continued working with patterns, 'This is the pattern one of the girls chose to make (she struggled [with patterns] while you were here) . . . . Good to see that she has decoded something new', (teacher's SMS, 9 January 2020). Figure 2 shows the photo that supported this SMS message, this is what the student with the 'malong' made that day. The teacher interpreted the student's work to be a creation of repeating patterns. Bess here showed a genuine interest in participating in the research project, by capturing photos and sending messages to the researcher.

During the interview five months later, Anne asked Bess for observations of children using their knowledge of patterns in other contexts. The question refers to Norway's Core curriculum, where one aim is that students can learn to apply subject knowledge and skills in familiar and unfamiliar contexts (KD (Ministry of Education [Kunnskapsdepartementet]) 2017). Bess' reply was about the student with the 'malong'

> Bess: She met some challenges [during the teaching unit] when she should create pattern herself with all the items that were put there [in front of them]. She picked me up in a recess to show that she had created pattern in snow. (Transcript from interview, 23 June 2020)

Figure 3. The girl's pattern in the snow. (Photo: Gladys Berntsen).

Bess explained how the student had created a pattern in the snow on her own and then she asked the teacher to come and watch her work. This shows two respectful actions from the teacher; she paid *attention* to the student's work, and she *offered time* for her. Bess used the listening skill *interpretation* and then she confirmed that the student had understood the task and solved it properly. The student's snow pattern is presented in Figure 3.

Bess captured the photo on January 13, which was one week after the teaching unit. This was definitely not what Anne expected to hear. Fyhn and Hansen's (2019) study revealed that children were able to recognize and create patterns in several contexts, but it was more challenging to apply their knowledge about patterns when the new context was snow. The final part of the teaching unit was an outdoor lesson where the children were instructed to create patterns in snow. This turned out to be complicated. Many of the children just started playing in the snow and most of them did not make any patterns (researcher's notes, 7 January 2020). Bess' report demonstrates that the student had indeed continued working with patterns on her own. Bess explains:

> It was a snowbank. She put her head into it and had one hand at each side [of her head]. Then she moved similarly to the right [and repeated her action]. Then a pattern appeared. I thought Yes! Then she had got it. She is on her way. (Transcript from interview, 23 June 2020, authors translation)

When she sent the photo, Bess explained the shape of the student's head in the snow pattern, 'she wore a cap with a kind of ears that she wanted to show' (teacher's SMS, 13 January 2020). The student's choice of cap shows that she had planned her presentation for the teacher before she went to school that day. The cap caused a characteristic repeating snow pattern, opposed to a cap with an ordinary round shaped contour. The teacher's explanation of the student's actions shows how Bess *perceived* and *interpreted* what the student did and what she said. Bess even *interpreted* the girl's body language.

Discussion and conclusion

The findings reveal insights into one experienced teacher's communication with parents and children from two situations that she was engaged in. We do not have data on all children and their parents. The teacher's reflections show that teaching and learning continued after the lesson finished; Bess participated in a research project, and she continued communicating with parents, children and the researcher about issues related to the teaching unit's content. Her SMS messages to the researcher show her interest in her work and in participation in the research project, as Yaro, Amoah, and Wagner (2020) emphasize as important. The teacher's communication is characterized by her respectful listening; application of respectful actions and listening skills. Bess applies the listening skills *perception, interpretation*, and *enacting* as described in Rost's (1990) study

of language learning. Her listening skills cannot be separated from the respectful actions, *attention, offering time, equality of treatment*, and *acts of solidarity*, as described by Burns, Lyons, and Niens (2017). Bess' performance of listening skills as well as her behavior related to showing *attention* is expected to be closely related to her experiences; she grew up in a similar rural diverse community and she has lived where she lives now for decades.

The teacher's listening with attention is also in line with Munter, McKinley, and Sarabia's (2012) point, that the real key is learning how to listen, how to care, how to be nonjudgmental. By respecting parents' home cultures and mother tongues the teacher gives the parents the status of a full partner in the social interaction, which according to Fraser (2000) is central in recognition. The teacher cooperated respectfully with the mother and the girl in the two studied situations, and according to D'Ambrosio (2007), respect and cooperation are essential components in the ethics of diversity. The teacher's application of skills to show respect for parents is in line with UNESCO's (2008) promotion of peace through education.

Prediger (2010) asks what kind of mathematical knowledge prospective teachers need for teaching and for understanding student thinking. She shows that teachers' diagnostic competence has at least four constituents, in addition to mathematical knowledge and knowledge about typical difficulties with and meanings of mathematical concepts, the teacher also has to show interest in students' thinking and to apply an interpretative attitude of understanding. Prediger claims that listening is important, but she does not inform about what kind of listening skills that are important. We expect that our study may contribute to future studies about teachers' listening in any classroom, particularly the two points offering time and knowledge about second language learners' challenges.

Artigue and Blomhøj (2013) present ten concerns that are valuable for inquiry- based mathematics education. One of these is the guiding role of the teacher and teacher(s)-students' dialogic interactions. The dialogical interactions rely on Alrø and Skovsmose's (2002) eight dialogic acts, in Danish: 'dialogiske talehandlinger' (Alrø and Skovsmose 2006). "Talehandlinger" means speaking actions. These actions are necessary for communicating and negotiating intentions, for fostering and sharing reflections and for encouraging and valuing critique. Listening is not a speaking action. Our study may contribute to the concerns for inquiry-based mathematics education by providing insight into the role of teachers' listening skills in dialogical interactions.

The North Sámi verb *gullat* means to hear and the word *gulahallan* means communication (Giellatekno 2022). Norwegian (and English) lack words for communication that explicitly include listening. Future research may provide insight into how Sámi mathematics teachers deal with different words for communication.

Regarding peace education, Oppenheimer (2009) points out that it may not be the presence of war and violence in the world around us that should worry us but rather the absence of positive attitudes toward peace in the most fundamental social institutions in our societies. Our study shows the teacher's positive attitudes toward peace, manifested as respectful actions which are intertwined with listening skills. The teacher showed a genuine interest in students' home cultures and *offered time* to listen to them. The teacher's listening skills were crucial for her understanding of the situation when a mother misinterpreted what Bess said. Bess *perceived* and *interpreted* what the mother said and used her *enacting* skills to let the mother clear up the situation together with her daughter.

Oppenheimer (2009) claims that peace education programs should focus on achieving changes not only in cognition and behavior but also in emotions. The communication between the teacher and the mother caused emotional changes; the mother was laughing when she realized what the misinterpretation was about, and she approached the teacher with a smile when they met again half a year later.

Skovsmose (2005) distinguishes between students' backgrounds and foregrounds. If the foreground is what matters to the student, then maybe the teacher should not focus on her or his background. The homework task in the teaching unit was for the children to bring an item to school. They were free to choose what they wanted, but the teachers encouraged them to choose something from their home culture. By doing so, the teachers invited the children to show some of their home culture for the class, but they also respected that some of the children might prefer their foreground to their background. For instance, some of the children presented drawings they recently had made as school, not everyone presented something from their background.

Children between 6 and 8 years old have an incipient development of self-respect in relation to culture (Divrengi and Aktan 2011). The student in our study presented her mother's *malong* with pride for the class at the time she was struggling to grasp the idea of pattern. After that, she continued working with patterns. Then, on her own initiative, she grabbed the teacher during a recess and showed Bess how to create a pattern in the snow with her head, cap, and gloves. Our data do not reveal whether the student's work with pattern was caused by her experiences with the 'malong' in the classroom. However, regarding empirical work on the experience of pride, relatively little is known about how social or interpersonal aspects are represented (van Osch and Zeelenberg 2018). Our study creates space for further research in culturally diverse classrooms for children between 6 and 8 years old, where the research focus is on relations between children's experiences with pride and their development of mathematical ideas.

Do Carmo Santos Domite (2010) studied encounters of non-Indigenous mathematics teacher educators and Indigenous teachers. She points at the teacher educators' poorly developed 'listening' as a great challenge. The teacher educators are not prepared to listen and then, speak with the 'other'. The educator in general is external to the Indigenous culture – an environment in which the educator/teacher educator does very little 'listening' to the teachers or interacting with the questions posed by them. Our study points at a very different situation, the mathematics teacher Bess is listening to parents and children even though she is external to their home cultures. We suggest that our study's contribution may function as a tool for describing what characterizes a teacher's respectful listening in a culturally diverse setting.

Our study focuses on the teacher's communication with one parent and one student. Most of the students seemed engaged and interested during the teaching unit, but we do not know the further outcome for the rest of the class. Nor have we investigated how the other parents experienced communicating with the teacher. A follow up study may focus on a broader perspective.

Note

1. The Sámi are an Indigenous people of the Arctic, who inhabit the North Calotte area of Norway, Sweden, Finland and Russia.

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No potential conflict of interest was reported by the author(s).

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References

Aarseth, Bjørn. 1989. *Grenser i Sameland*. Vol. 13,Samiske Samlinger.Oslo: Norsk folkemuseum.

Alrø, Helle, and Ole Skovsmose. 2002. *Dialogue and Learning in Mathematics Education: Intention, Reflection, Critique*. Dordrecht: Kluwer.

Alrø, Helle, and Ole Skovsmose. 2006. "Læring mellem dialog, intention, refleksion og kritik." In *Kunne Det Tænkes? – Om Matematiklæring*, 127–138. Albertslund: Forlag Malling Beck A/S.

Artigue, Michèle, and Morten Blomhøj. 2013. "Conceptualizing inquiry-based Education in Mathematics." *ZDM Mathematics Education* 45: 797–810. doi:10.1007/s11858-013-0506-6.

Bishop, Alan J. 1988. "Mathematics Education in Its Cultural Context." *Educational Studies in Mathematics* 19 (2): 179–191. doi:10.1007/BF00751231.

Bongo, Berit Aslaksdatter 2012. "«Samer snakker ikke om helse og sykdom». Samisk forståelseshorisont og kommunikasjon om helse og sykdom. En kvalitativ undersøkelse i samisk kultur." PhD Philosophiae Doctor, Department of Health and Care Sciences, UiT-The Arctic University of Norway. https://munin.uit.no/bitstream/handle/10037/5458/thesis.pdf?sequence=7&isAllowed=y

Burns, Stephanie, Evanthia Lyons, and Ulrike Niens. 2017. ""The World Would Just Fall Apart if There's No Respect at All": Children's Understandings of Respect for Diversity in a Post-Conflict Society." *Journal of Peace Education* 14 (1): 15–31. doi:10.1080/17400201.2016.1269313.

D'Ambrosio, Ubiratan. 1985. "Ethnomathematics and Its Place in the History and the Pedagogy of Mathematics." *For the Learning of Mathematics* 5 (1): 44–48.

D'Ambrosio, Ubiratan. 1998. "Mathematics and Peace: Our Responsibilities." *ZDM* 30 (3): 67. doi:10.1007/BF02653170.

D'Ambrosio, Ubiratan. 2007. "Peace, Social Justice and Ethnomathematics." *The Montana Mathematics Enthusiast Monograph 1*. edited by Bharath Sriraman, 25–34. MT: Missoula: Montana Council of Teachers of Mathematics. http://www.math.umt.edu/tmme/Monograph1/D'Ambrosio_FINAL_pp25_34.pdf

Davis, Brent. 1997. "Listening for Differences: An Evolving Conception of Mathematics Teaching." *Journal for Research in Mathematics Education* 28 (3): 355–376. doi:10.2307/749785.

Divrengi, Mihrap, and Ebru Aktan. 2011. "Early Childhood Education in Turkey: Pre-School Teachers' Attitudes Towards Diversity." *Journal of Peace Education* 8 (1): 37–53. doi:10.1080/17400201.2011.553377.

Do Carmo Santos Domite, Maria. 2010. "The Encounter of Non-Indigenous Teacher Educator and Indigenous Teacher: The Invisibility of the Challenges." *ZDM* 42 (3–4): 305–313. doi:10.1007/s11858-010-0249-6.

Doerr, H M. 2006. "Teachers' Ways of Listening and Responding to Students' Emerging Mathematical Models." *ZDM* 38 (3): 255–268. doi:10.1007/BF02652809.

Dorier, Jean-Luc, and Katja Maass. 2020. "Inquiry-Based Mathematics Education." In *Encyclopedia of Mathematics Education*, edited by Stephen Lerman, 384–388. Springer. doi:10.1007/978-3-030-15789-0_176.

Dunfjeld, Maja. "*Tjaalehtjimmie. Form og innhold i sørsamisk ornamentikk*. [Tjaalehtjimmie. Shape and Content in South Sámi ornamentation] Snåsa: Saemijen Sijte." Reprint, Dissertation for the degree of Dr. art. University of Tromsø: Department of Art History, Faculty of Humanities, 2001/2006.

Empson, Susan, B, and R. Jacobs Victoria. 2008. "Learning to Listen to Children's Mathematics." In *Tools and Processes in Mathematics Teacher Education*, edited by Dina Tirosh and T. Wood, 257–281, Rotterdam: Sense publishers.

Frankenstein, Marilyn. 1983. "Critical Mathematics Education: An Application of Paulo Freire's Epistemology." *Journal of Education* 165 (4): 315–339. doi:10.1177/002205748316500403.

Fraser, Nancy. 2000. "Rethinking Recognition." *New Left Review* 41 (3): 107–120. https://newleftreview.org/issues/ii3/articles/nancy-fraser-rethinking-recognition

Fyhn, Anne Birgitte, and Lisbet Hansen. 2019. "Exploration of Patterns in Different Contexts." In Proceedings of Eleventh Congress of the European Society for Research in Mathematics Education, edited by U. T. Jankvist, den & M. Veldhuis, Van den Heuvel-Panhuizen, M., 1672–1679. Utrecht, Netherlands: Freudenthal Group & Freudenthal Institute, Utrecht University and ERME. https://hal.archives-ouvertes.fr/hal-02435305/document

Giellatekno. 2022. *Neahttadigisánit*. Tromsø: UiT-The Arctic University of Norway. https://sanit.oahpa.no/sme/nob/

Greer, Brian, and Swapna Mukhopadyay. 2012. "The Hegemony of Mathematics." In *Opening the Cage. Critique and Politics of Mathematics Education*, edited by Ole Skovsmose and Brian Greer, 229–248. Rotterdam, Boston, Taipei: Sense Publishers.

Hanson, Norwood Russel. 1958. *Patterns of Discovery: An Inquiry into the Conceptual Foundations of Science*. Cambridge: University Press.

Harber, Clive, and Noriko Sakade. 2009. "Schooling for Violence and Peace: How Does Peace Education Differ from 'Normal' Schooling?" *Journal of Peace Education* 6 (2): 171–187. doi:10.1080/17400200903086599.

Hintz, Allison, and Kersti Tyson. 2015. "Complex Listening: Supporting Students to Listen as Mathematical Sense-makers." *Mathematical Thinking and Learning* 17 (4): 296–326. doi:10.1080/10986065.2015.1084850.

Hunter, Roberta, Jodie Hunter, Glenda Anthony, and Katrina McChesney. 2018. "Developing Mathematical Inquiry Communities. Enacting Culturally Responsive, Culturally Sustaining, Ambitious Mathematics Teaching." *Set: Research Information for Teachers* 25 (2): 25–32. doi:10.18296/set.0106.

KD (Ministry of Education [Kunnskapsdepartementet]). 2017. *Core Curriculum – Values and Principles for Primary and Secondary Education*. Oslo: Norwegian Directorate for Education and Training. https://www.udir.no/Udir/PrintPageAsPdfService.ashx?pdfId=150459&lang=eng

KD (Ministry of Education [Kunnskapsdepartementet]). 2019. *Læreplan I Matematikk 1.-10.trinn [Curriculum for the Common Core Subject of Mathematics]*. Oslo: Norwegian Directorate for Education and Training. https://data.udir.no/kl06/v201906/laereplaner-lk20/MAT01-05.pdf?lang=nob

Larvor, Brendan, and Karen François. 2018. "The Concept of Culture in Critical Mathematics Education." In *The Philosophy of Mathematics Education Today, ICME-13 Monographs*, edited by Paul Ernest, 173–185. Hamburg: Springer International Publishing AG. doi:10.1007/978-3-319-77760-3_11.

Lerman, Stephen, and Robin Zevenbergen. 2004. "The Socio-Political Context of the Mathematics Classroom. Using Bernstein's Theoretical Framework to Understand Classroom Communications." In *Researching the Socio-Political Dimensions of Mathematics Education: Issues of Power in Theory and Methodology*, edited by Paola Valero and Robin Zevenbergen, 27–42. Boston: Mathematics education library, Kluwer Academic Publishers.

Lipka, Jerry, Barbara Adams, Monica Wong, David Koester, and Karen Francois. 2019. "Symmetry and Measuring: Ways to Teach the Foundations of Mathematics Inspired by Yupiaq Elders." *Journal of Humanistic Mathematics* 9 (1): 107–157. doi:10.5642/jhummath.201901.07.

Lynch, Tony. 2010. "Listening: Sources, Skills, and Strategies." Robert B. Kaplanedited by *The Oxford Handbook of Applied Linguistics2 ed.)*,74–87.Oxford:Oxford University Press. doi:10.1093/oxfordhb/9780195384253.013.0005.

Munter, Judith, Lyn McKinley, and Kristine Sarabia. 2012. "Classroom of Hope: The Voice of One Courageous Teacher on the US–Mexico Border." *Journal of Peace Education* 9: 49–64. doi:10.1080/17400201.2012.657616.

Neumann, Maureen D. 2014. "Mathematics Teaching: Listening, Probing, Interpreting and Responding to Children's Thinking." *Investigations in Mathematics Learning* 6 (3): 1–28. doi:10.1080/24727466.2014.11790333.

Oppenheimer, Louis. 2009. "Contributions of Developmental Psychology to Peace Education." In *Handbook on Peace Education*, edited by Gavriel Salomon and Ed Cairns, 103–119. London: Taylor & Francis Group.

Prediger, Susanne. 2010. "How to Develop Mathematics-for-Teaching and for Understanding: The Case of Meanings of the Equal Sign." *Journal of Mathematics Teacher Education* 13 (1): 73–93. doi:10.1007/s10857-009-9119-y.

Rasmussen, Torkel. 2018. "Sami Language in Primary and Secondary Education." *Sami Statistics Speak. Numbers and Commentary*. edited by Snefrid Møllersen Kevin Johansen, Torkel Rasmussen, Iulie Aslaksen, and Per Tovmo, 169–195. Guovdageaidnu: Sámi University of Applied Sciences. http://samilogutmuitalit.no/sites/default/files/publications/samiske_tall_10_engelsk_-_web.pdf

Rost, Michael. 1990.*Listening in Language Learning* Applied Linguistics and Language Study , edited by Christopher N. Candlin. London & New York: Longman, 278.

Skovsmose, Ole, and Marcelo Borba. 2004. "Research Methodology and Critical Mathematics Education." In *Researching the Socio-Political Dimensions of Mathematics Education: Issues of Power in Theory and Methodology*, edited by Paola Valero and Robyn Zevenbergen, 207–226. Boston, MA: Springer US.

Skovsmose, Ole. 2005. *Travelling Through Education: Uncertainty, Mathematics, Responsibility*. Rotterdam: Sense Publishers.

Skovsmose, Ole. 2006. "Research, Practice, Uncertainty and Responsibility." *The Journal of Mathematical Behavior* 25 (4): 267–284. doi:10.1016/j.jmathb.2006.11.002.

Skovsmose, Ole. 2020. "Critical Mathematics Education." In *Encyclopedia of Mathematics Education*, edited by Stephen Lerman, 154–159. Springer. doi:10.1007/978-3-030-15789-0_34.

SSB (Statistics Norway) 2020. "*Population. 11342 Population and Area*." https://www.ssb.no/en/statbank/table/11342

Stewart, John, and Milt Thomas. 1995. "Dialogic Listening: Sculping Mutual Meanings." In Bridges Not Walls. A Book about Interpersonal Communication, edited by John Stewart, 184–201. 6th ed. New York: McGraw-Hill, Inc.

UNESCO (United Nations Educational, Scientific and Cultural Organization). 2005. *Peace Education. Framework for Teacher Education*. New Delhi: UNES. https://unesdoc.unesco.org/ark:/48223/pf0000150262

UNESCO (United Nations Educational, Scientific and Cultural Organization) 2008. "*UNESCO's Work on Education for Peace and Non-Violence. Building Peace through Education*." https://unesdoc.unesco.org/ark:/48223/pf0000160787

van Osch, Yvette, Marcel Zeelenberg, and Seger M. Breugelmans. 2018. "The Self and Others in the Experience of Pride." *Cognition and Emotion* 32 (2): 404–413. doi:10.1080/02699931.2017.1290586.

wikipedia. 2020. "*Malong*." https://en.wikipedia.org/wiki/Malong

Yaro, Kwesi, Emmanuel Amoah, and David Wagner. 2020. "Situated Perspectives on Creating Mathematics Tasks for Peace and Sustainability." *Canadian Journal of Science, Mathematics and Technology Education* 20 (2): 218–229. doi:10.1007/s42330-020-00083-w.