

# **Seeking a Strength-Based Approach to Assessment in a Multicultural Context: A Participator Approach**

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## **Abstract**

In this paper we present our reflections on collaborative tests in mathematics as a strength-based approach to assessment in upper secondary school. Our reflections are based on analysis of student–student interactions during collaborative test situations and post-test interviews with the students. The participating students are from a town in Northern Norway and the surrounding areas, where the majority people have (diverse Indigenous) cultural heritage that differs from the main national culture. We are using positioning theory as a lens for our reflections, and we build on a consideration raised by the students: trust is crucial in collaborative test situations. More precisely, we have identified storylines at play in the students' talk about rights and duties.

## **Introduction**

Our purpose in writing this paper is to better understand collaborative tests as a strength-based approach to assessment in mathematics in a multicultural context within the frames of positioning theory. The backdrop of these reflections is a larger longitudinal, participatory research project, the MIM project<sup>1</sup>, with teachers, administrators, community members, youth, and families in Northern and Southern Norway. Working closely with schools and communities, the goal is to investigate what can support and challenge mathematics education in times of societal changes and movements in migrational and Indigenous contexts. Specifically, this paper reports on one part of the project where researchers and teachers work in partnership in multilingual and multicultural classrooms in Indigenous areas in Northern Norway.

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<sup>1</sup> <https://www.usn.no/english/research/our-research/kindergarten-schools-and-higher-education/mathematics-education-in-indigenous-and-migrational-contexts/>

One of the teachers, Ane, in the participatory research study introduced the researchers to collaborative tests in mathematics. The teacher explained that her students expressed that they preferred collaborative tests over individual tests, and the teacher was interested in developing a better understanding of collaborative tests as a strength-based approach to assessment in mathematics. The teacher also expressed that the collaborative test situations might be “fairer” than the more traditional test as she saw that her students to a greater extent were able to show their competence in mathematics. She saw that the collaborative test helped the students overcome barriers not related to their competence in mathematics, such as reading and understanding what the tasks ask of them. In early interviews with students from this school about their experiences with mathematics, the majority expressed that their grades had gone up after they got this particular teacher (we did not ask about the collaborative tests explicitly). A surprisingly high number of the students expressed this through statements such as “I always thought I was no good in mathematics...” and “I thought I was stupid until...” These statements cultivated our curiosity about changes in students’ positions.

We (the three coauthors) analyzed data from student–student communication during collaborative tests and from interviews with the students after these tests as sources for describing storylines of collaborative test situations. In an early phase of the analytical process, we became aware of *trust* as a wish or requirement the students had in relation to their partners. Törrönen et al. (2013) noted that “trust includes both social and moral elements which are combined with free will and norms of the society” (p. 11). When the students in our study talked about trust, they expressed expectations for rights and duties in relationships with peers and teachers. Therefore, we considered the students’ use of the word *trust* to be related to positioning as a reciprocal phenomenon. Trust affects how the interlocutors give and take responsibility for accepting or rejecting available positions. We found that trust is the foundation of shaping positions that allows people to critically challenge the established common-sense understandings, and hence promotes free will.

In this paper, we understand strength-based approaches as students' opportunities to show mathematical proficiency. We build on research showing that these opportunities are dependent on students' access to participate with authority and agency in meaning-making processes (e.g., Boaler & Sengupta-Irving, 2016; Watson, 2002). An opposite situation is when students are in a context of low academic expectations. Here students do not always have access to participate, and the low expectations can hinder their access to mathematical learning opportunities (Straehler-Pohl et al., 2014). According to Harré (2012), positioning theory has the potential to provide insight into human interaction. Harré (2012) explains: "Positioning Theory is based on the principle that not everyone involved in a social episode has equal access to rights and duties to perform particular kinds of meaningful actions at *that moment and with those people*" (p. 193, italic in original).

The local context is a school that recruits students from a larger area which is multicultural in the sense that the majority of students in the area have cultural heritages that differ from the national majority culture. The area is historically, and still today, composed of several northern peoples (mostly Sami and Kven) as well as elements of various nationalities all intertwined in the families and the local community. The students have diverse cultural backgrounds and it is normal, not the exception, to have family histories that deviate from the main national narrative of the ethnicity and culture of the inhabitants. The teacher Ane is from another part of the country, has settled in the area and lives together with a local woman with similar background as the students in our study. The researchers are both from the county in which this research takes place. Anita has Sami and Kven identity and family history, and Hilja has Kven identity with Kven language in her immediate family. More information about the cultural context of the students is provided in the article "Culturally based mathematics tasks: a framework for designing tasks from traditional Kven artefacts and knowledge" (Huru et al., 2018).

The social episodes we report in this paper are related to student–student interactions during collaborative test situations in mathematics. We investigate positions between the students and report one of multiple storylines identified in social episodes at particular moments with particular

students. The research question guiding the reflections we present in this paper is: *What characterizes students' expressions about rights and duties in collaborative test situations?*

## Theory

Positioning theory frames communication as immanent and co-constructed by the participants taking part in the actual communication (Davies & Harré, 1990). When one person takes a position, the person is both positioning themselves and other people taking part in the communication, and in that way positions are reciprocal. Within this frame, mathematical learning opportunities can be conceptualized as dynamic, depending on the positions taken and given in a particular classroom episode. Andersson and Wagner (2019) report from their study that “the discourses available to a person in a context may be different than the discourses available to others in the same context” (p. 539). Resonating with the findings reported by Andersson and Wagner (2019), we understand positions as dynamic and negotiable. This dynamic has been addressed by Herbel-Eisenmann et al. (2015) who describe this through relationships between communication acts and positions (see Figure 1). On the one hand, communication acts are considered to initiate, maintain and negotiate the potential positions, illustrated by the stack of possible positionings on the right-hand side of Figure 1. On the other hand, the positions taken are considered to format the potential and actual communication acts and our choices in the moment of interaction.

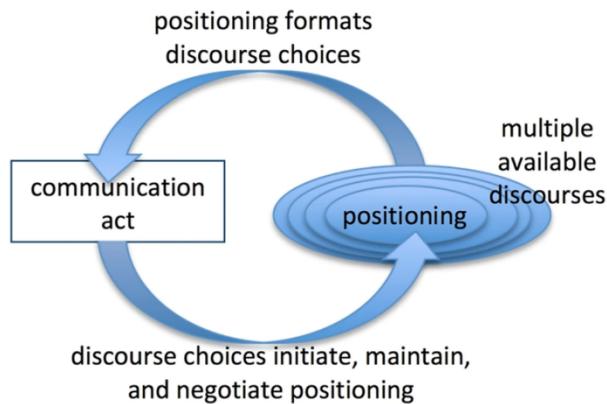
People see and interpret their available positionings in interactions through storylines. Classical examples of storylines are those of relationships like coach/athlete, nurse/patient, mother/child, teacher/student. Such storylines are cultural stereotypes and may be called on as a resource (Berman, 1999). As the classical examples mentioned show, storylines make different positions available, which could be either accepted or resisted. For example, in a homework situation both the parent/child and teacher/student storyline could provide available positionings that could either be accepted, or one of the parties could try to interact within a different storyline (Andersson et al, 2022). In this way storylines are negotiable. In authentic situations, however, such relationships tend to be more complex, involving more than two parties and several, sometimes

conflicting, storylines (Langer-Osuna and Avalos, 2015). As an example, in classroom interactions we can imagine several classical and stereotypical positionings that may be available. In addition to the binary teacher/student storyline we may have the assistant teacher, the class clown, the hardworking clever girl, the quiet nerd, the noisy boy with a troublesome home situation, etc. Still, as Harré (2012) described them, storylines are “lived stories for which told stories already exist” (p. 198) and as the stories in other words already are told, the storylines both define and confine the amount of freedom in positionings in interactions, and describe available positionings. For minorities and students of minoritized groups the “told stories” that already exist through storylines and their related positionings are often deficit based, such as the storyline *Students from minoritized groups underachieve* found in Norwegian news media (Andersson et al., 2022).

As we can see from our discussion and as pointed out by Wagner and Herbel-Eisenmann (2009), positionings are fuzzy, not crisp and static. To sharpen and to help us work out the fuzzy images of positioning, Wagner and Herbel-Eisenmann (2009) describe positionings in mathematics education as: *Immanent* rather than transcendent as it happens in the moment in human interactions; *Reciprocal* as this human interaction goes both ways; *Contingent* as any situation can be interpreted with different storylines and there is no correct storyline or positioning to any given situation, and; *Contestable* as the participants can make moves to change the positioning. Simensen et al. (2015) addressed this fuzziness focusing on different positioning and space for communication for low achieving students in different heterogeneous groups.

In this paper, we are interested in better understanding the fuzziness of positions in the context of a school in a historically multicultural and colonialized community and how students express their experiences with positionings working on collaborative tests. In interactions where students work with tasks in mathematics, positioning theory might be helpful for addressing students learning opportunities as immanent and local in the classroom interaction or working together on a mathematical task or problem, and reciprocal and relational both in student-student and student-teacher interactions. The contingency of the positionings relates to aspects of students’ Journal of Mathematics and Culture

access to learning opportunities through their interpretation of storylines being played out, the interaction with each other, and with the teacher(s). Finally, the degree of staticity or fluency of access to learning opportunities manifests through the degree of contestability in the observed situation. As our data shows, the degree of contestability is visible in the students' reflections looking back at their earlier schooling.



**Figure 1: Relationship among communication acts and interpretive frames (Herbel-Eisenmann et al., 2015, p. 194).**

Rights and duties are suggested crucial aspects of the storylines unfolding and the positions available to the actors (Herbel-Eisenmann et al., 2015). Rights and duties can be understood as two sides of the same coin. They are both present at the same time, but it may be difficult to see both at the same time. Rights are what someone expects others to do for them. Duties are what someone thinks they must do for others. In our analysis we use this duality to identify both rights and duties: If only one of them is visible in the data, the other can be derived by “flipping the coin.” When expectations about rights and duties are shared in a group of people, they can be said to be interpersonal. When they are not shared, that is, each person has different expectations to rights and duties, they can be said to be intrapersonal. Davies (2022) describes how power/knowledge can (and will) affect relations. When expectations about rights and duties are not shared in a group of people, the “taken for granted” can be questioned and changed. These changes can initiate and negotiate new available positions.

## **Methodology**

To address our research question, we have collected data in two rounds:

1) Interviews of nine students at the participating upper secondary school. These nine interviews were done a few months ahead of the next round of data collection.

2) Observations of student-student interaction during collaborative tests in mathematics and interviews after collaborative test situations involving four students in grade 11 at the same upper secondary school as the nine students from round 1.

All data was audio recorded and transcribed in full length.

The aim of the nine initial interviews was to give a background for our analysis. We looked for possible storylines that would give us more insight into the positionings that might be available for these students in their interactions in this specific learning situation. The focus of these interviews included background of students, how the students (do not) like to work with mathematics, examples of when mathematics made them feel good, the students' attitude to mathematics and their hopes and dreams.

The four students working with collaborative tests were 16 and 17 years old, one boy and three girls. Two of the students are from families with Sami and Kven backgrounds. One of these students said that one of her grandmothers' mother-tongues was Kven and one of her grandfathers' mother-tongues was Sami. She herself spoke a little Sami. Most of her and her parents' Sami and Kven languages were lost, however, as a consequence of the harsh assimilation processes in Norway (approx. 1850–1980). The two other students moved to Norway when they were 8 and 10 years old. They were born and have their mother-tongue from countries in, respectively, Asia and southern Europe. The student from Asia explained that she was not fluent in her mother-tongue anymore as she did not read or write it well. She shared that, "when my mother sends me a text-message on my phone, I have to call her and ask what the text-message is about." Hence, she was fluent in speaking her mother-tongue, but not in writing or reading it. The fourth student explained that she and her family visit their home country frequently and that she felt more fluent in her

mother-tongue than in Norwegian. Both her mother and father have the same mother-tongue, and it is the family's home language.

During the collaborative test situations, the students were organized in groups of two or three. To facilitate student–student interactions and opportunities for the students to discuss tasks without disturbing other students, the small groups worked in separate rooms. When interviewing the students about the collaborative test situations, we found that the word *trust* came up several times. The students used the word *trust* in terms of both rights and duties. The storylines we share in the following section originate from our reflections about the students' use of the word *trust* and our understanding of rights and duties.

Because the nature of storylines is contingent and contestable, we, as the authors, reflected on *who are we to identify storylines from student voices?* We agree with Solomon (2012), who notes that interviewees might say things they believe the interviewers want to hear, and we are aware that we have chosen specific pieces from our data to be presented in this article. Because we conducted group interviews, we have the impression that the interview situations were more like informal conversations between the students than structured conversations of us asking and the students answering questions. Retrospectively, we realise that discussing the presented findings with the student participants could have allowed for stronger student voices to be visible in our text.

## **Findings**

In the initial 9 interviews with students, we saw multiple storylines, and, in this paper, we address one of them through focusing on the students' use of the word *trust*. When reflecting on their schooling and experiences with mathematics most of the students expressed a shift in how they saw themselves in relation to mathematics. This shift was described as moving from “stupid” to someone who can do mathematics. That is, their position changed. In most cases this shift was attributed to their current teacher. We attributed this to the fact that their access to mathematics changed and that their interactions/actions in learning situations involving mathematics changed from passive to more active. We saw a similar pattern in research literature. When students struggle

in mathematics, both the student and their teachers can (re)produce and co-construct the previous lack of achievement through low expectations (Heyd-Metzuyanim, 2013). Expectations seemed to exist in which there are students who *can* and students who *cannot* do mathematics, and these expectations reproduce previously available positions (Straehler-Pohl, et al., 2014). We see a related storyline in the research literature describing how expectations like these position students as those with and those without access to mathematics. These positionings (can and cannot do mathematics) are expressed as fixed, and the students seemed to see the older version of themselves stuck within a category without access and no hope to gain access to participate with authority and agency in meaning-making processes in mathematics.

In the four interviews after the collaborative test situations, however, we saw how students' discussions about trust illustrate how they negotiated this storyline and navigated themselves as well as their peers out of the fixed categories. They described how, through companionship, they gained access to mathematical knowledge. To sum up, through the students' use of the word *trust* we found the storyline "There are students that can and students that can't do mathematics." We saw that the contestability of the positionings as someone who can or cannot do mathematics increased as the students express no longer being stuck; the world of mathematics opened up to them and they have increased accessibility to learning opportunities through trust. Finally, their access to mathematics was contingent on the presence of an alternative storyline. We chose to name this new alternative storyline with its related positionings as "Each encounter with mathematics is an opportunity to engage and learn, independent of previous achievements or experiences."

In the following, we will provide insight into the students' use of the word *trust* and how *trust* relates to the identified storylines and the positionings' immanence and reciprocity for rights and duties. We organize our results around the students' voices.

The students addressed rights through the word *trust* according to peers several times and this seemed to be particularly important for the students. Anna, one of the students, explained: "Trust is important because when one of us felt insecure, and the others trusted this student, the Journal of Mathematics and Culture  
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student felt supported. This was the case for me at least.” The students described further how being trusted by the peers helped them to overcome insecurity and as such, provided opportunities to engage in mathematics they could not have engaged in if the test situation was individualized. We interpreted this as a shift in the students’ positioning: they changed from someone who cannot do mathematics to someone who can do mathematics. Moreover, we saw that Anna expressed the importance of immanence of trust as a duty; it affected, and maybe even *decided*, if a student felt insecure or secure in that situation and that moment. Anna explained: “One of the hardest aspects of mathematics is trusting yourself. There are so many elements in mathematics: letters and numbers. And what does the task ask you to do: remember, calculate, explain, argue?”

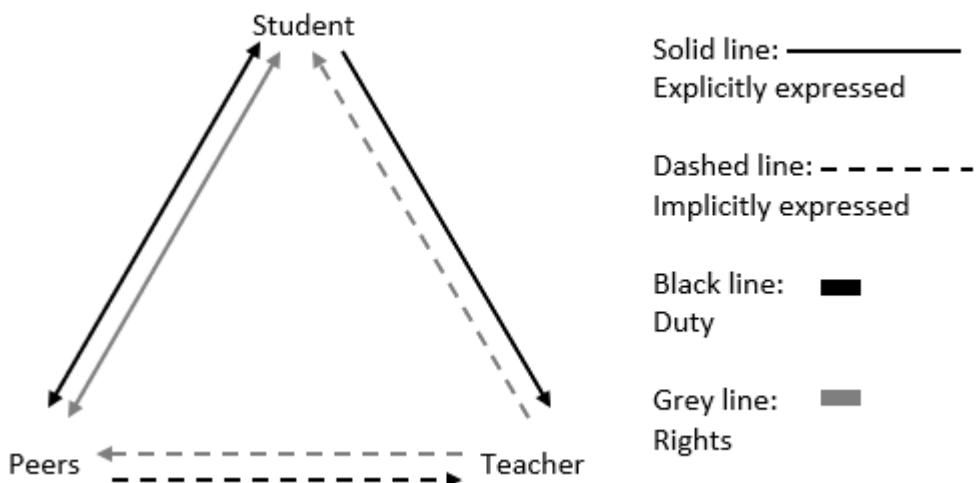
During the interviews, the students expressed explicitly rights and duties about student–student relations. For student–teacher relations, however, they expressed duties only. This did not mean that rights in student-teacher relations were not visible in the students’ communication during the collaborative test situations. In Figure 2, we have addressed both these explicit and implicit expressions, earlier explained as “flipping the coin.” The explicit expressions are illustrated by solid lines (black for duties and grey for rights). The implicit expressions are illustrated by dashed lines. Reciprocity of both rights and duties are explicit in student-student interaction. In student-teacher relation there was a lack of explicit reciprocity, only the student had a duty towards the teacher, and furthermore, this was only expressed for the student himself, not imposed on their peers.

When the students addressed rights, they implicitly addressed duties (what must others do for me). Rights and duties emerged as a pair in the students’ use of the word *trust* in student–student interactions. One cannot be expressed without addressing the other. This became visible when the students described their collaboration. Sophie explained: “Everyone contributed equally. But because we have different strengths, we could help each other and use the strengths of everyone in the group. This depends of course on each student’s motivation for sharing mathematical ideas.” Here Sophie addressed the importance of trusting that peers will share their ideas. This is, according to our interpretation, Sophie expected to have the right to work with motivated peers and the duty to Journal of Mathematics and Culture  
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trust that their peers would share mathematical ideas. These processes affected the moment, hence, showing immanence.

As mentioned, during the collaborative test situations the small groups of students worked in separate rooms. This organisation provided the groups with a private space. In terms of rights and duties, this private space seemed to implicitly communicate both rights and duties for the small groups. For example, students had the right to talk freely without disturbing peers in other groups and students had a duty to keep the communication on task. Traditionally, test situations in mathematics classrooms have been monitored by a teacher or another responsible person, whose duty was to make sure the students do not cheat or disturb peers. We assume the collaborative test situation and the private space changed this by expecting the students to take responsibility for their own actions as no one else was taking responsibility for their work.

The students also used the word *trust* to express rights and duties according to student–teacher relations. As illustrated in Figure 2, for student–teacher relations, only duties were addressed explicitly by the students. Anna explained: “I would like to add that first of all it is important to trust the teacher’s choice of groups.” The students followed up this statement by discussing how to handle collaborative test situations where the teacher organised a group where not all students were friends. Here, the students stressed the importance of trusting the teacher and also showing peers in the group that you trusted them. In other words, they had a duty to trust the teacher and a duty to show trust to their peers. The students expressed that the groups worked well and were fair, and this had made them trust their teacher when it came to organizing groups. One strategy to handle group work with peers that were not your close friends, Anna explained, was to remember that the situation was “about mathematics and nothing else.” When it came to students’ rights in teacher–student relations, the students also addressed the importance (and duty) of trusting the teacher to change groups when necessary. If a student achieved lower or higher than earlier and this was not the case for the peers, the student must trust the teacher would observe this change. We take this as another example of the students’ openness to change position.



**Figure 2: The students' use of the word trust to express rights and duties.**

When the students summarized the collaborative test situations, they addressed a change in learning opportunities. Oda explained: “In ordinary test situations, the learning opportunities end before the test. In collaborative test situations, however, we learn through the test situation.” The students further described that they felt ordinary (individual) test situations were assessment only and not about learning. Collaborative test situations, however, they described as both assessment and part of learning opportunities. We see that the classroom activities no longer were divided into first-learning-then-testing but learning itself was attributed with an aspect of immanence, and clearly communicated with the storyline found in the nine initial student interviews: “Each encounter with mathematics is an opportunity to engage and learn, independent of previous achievements or experiences.”

## Discussion

Our starting point was the students’ use of the word *trust* to express expectations about rights and duties. Harré (2012) stressed “that for every duty there is a right and for every right a duty” (p. 198). Our results show that students did have expectations about both rights and duties. That is, they had expectations about what they must do for others and what others must do for them. Students in our study addressed this duality when talking about other students. One example was, “I must share mathematical ideas [my duty, peers’ right] and the others must listen to me [my right,

peers' duty] and trust me [my right, peers' duty]." We interpret this as students expressing a kind of equal symmetry. As the example demonstrated, these types of utterances tended to include rights and duties for both the student and the peers (see Figure 2). This can be understood as the student considering both parts to be responsible for a symmetric interaction based on trusting the other to take responsibility for both rights and duties. Further, in our data, *student* and *peers* were constantly changing, depending on who spoke. When one student spoke, this student was referred to as *student* in our Figure 2, and when another student spoke, the first student was referred to as the *peers* in our figure. We have addressed this twofold symmetry in Figure 2 by two-way arrows between the student and the peers.

When the students expressed expectations about the teacher, however, the situation was different. In these situations, they addressed rights and duties explicitly from the duty aspect only. One example is "I must trust the teacher [my duty, the teacher's right] in organizing groups." We interpret this as the student expressing a kind of asymmetry. Figure 2 illustrates that we identified different expectations about rights and duties for the student-teacher relation, than for the student-peers relation. While the students expressed explicitly both rights and duties for the student-peers relation, represented by two-way arrows, they expressed only duties explicitly for the student-teacher relation, represented by arrows going in one direction only. From the analysis, it was not easy for us to identify that the students expressed duties for the teacher. This is not to say that it did not happen, but more data and careful analysis are needed.

We recognize that the power relations between student-student and student-teacher are different, and students and teachers are positioned differently. We find this particularly interesting considering Harré's (2012) discussion of rights and duties in light of "The Symmetry Presumption" (p. 198). The idea behind the "symmetry presumption" was that how people understand the relation between rights and duties depended on their cultural and historical background. From our (the authors') point of view, there tends to be a right for every duty. This view was strengthened by our analysis of how the students explained what they must do for others and what others must do for  
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them. To sum up, the storyline most visible for us from the students' expressions about trust from the right and duty point of view, was "Giving and receiving trust is crucial to learn from collaborative test situations."

Our reflections on the students' use of the word *trust* takes us to the contrasting storylines: "There are students that can and students that cannot do mathematics" and "Each encounter with mathematics is an opportunity to engage and learn, independent of previous achievements or experiences." Low expectations are not a novel phenomenon when it comes to achievement in mathematics. The main reason for our interest related to the students expressing a shift in how they saw themselves (from "stupid" to someone who can do mathematics). Moreover, we found the teacher's expectations to be in line with the students' expressions; she saw that her students were able show their competencies in mathematics to a greater extent when they did collaborative testing. As pointed out by Andersson et al. (2015), expectations may impact the students' learning of mathematics. Our results show examples of how contingency and contestability of positionings and storylines (Wagner & Herbel-Eisenmann, 2009) enable both the teacher and the students to negotiate the storyline "There are students that can and students that can't do mathematics" and thereby contest the categorization. We interpret the change in the students' ways of describing themselves as learners of mathematics as a positive starting point. The reason we describe it as *a starting point*, is that the students described their previous position as apparently static. Before they changed to an I-can-do-mathematics person, they believed they were an I-cannot-do-mathematics person. When they believed they could not do mathematics, they accepted the position without questioning it. They did not believe that they could change to become an I-can-do-mathematics person, they saw this position in mathematics as static. The importance of challenging authoritative discourses and common-sense ideas have been addressed by several researchers (e.g., Lange, 2019; Valero & Meaney, 2014). We agree with these researchers and suggest that the progress of accepting questions about such common-sense ideas were still in an early phase.

Another finding, also related to common sense, was the students' experiences with collaborative test situations as learning opportunities. This led us to the storyline "Giving and receiving trust is crucial to learn from collaborative test situations." Andersson et al. (2015) described mathematics as a gatekeeper to higher education and explained how achievement in mathematics was valued in society. They explain that "a risk with objectifying a person's former and related actions is that they can be read as statements of a person's current and future state and might function as self-fulfilling prophecies" (p. 144). The tensions and dilemmas addressed by Andersson et al. (2015) show that the education system is more based on assessment and grading/ranking rather than learning and strength-based pedagogies. Our findings resonate with the writing of Andersson et al. (2015). In collaborative test situations, students were given opportunities to influence discourses about tests and test situations. Students identified the collaborative testing as an opportunity to learn, and that more and more every moment was an opportunity to learn and opened up the storyline "Each encounter with mathematics is an opportunity to engage and learn, independent of previous achievements or experiences." This can contribute to developing more available positions for students in test situations, and hence change the mathematical learning opportunities for students.

In the introduction of this paper, we described how the teacher expressed high expectations to all students suggesting that collaborative tests can provide students access to express mathematical competence more easily than standardized and traditional tests. We suggest, based on research reporting on how expectations (re)produce learning opportunities and positions, that some students experience (too) low expectations and others experience (too) high expectations. Neither is beneficial for the individual student who needs to be supported as they move in and between the categories and not being stuck in one place where they may end up either giving up on themselves or never having the possibility to relax without breaking someone's expectations of them. These findings might indicate a need for challenging authoritative discourses about mathematical learning opportunities as something fixed and innate. We hope that when both teachers and students consider

positions (can and cannot do mathematics) as dynamic and dependent on available positions and storylines at play, this will influence political and authoritative discourses about learning opportunities in mathematics.

### Concluding Words

Our reflections ended with circular storylines where trust is the center: Trust is important. Each student needs to trust the other student(s) and this is reciprocal, it goes both ways. Communication before the test situation is important because roles and positions can be clarified (trust building). The students need to trust the teacher: the teacher should organize fair groups where the students can trust each other. These groups should not be fixed but change according to each student's achievement and wellbeing. These are duties of the teacher not expressed (nor explicitly nor implicitly) by the students in our study but a duty, or recommended duty, that emerges in our analysis and discussion. Wagner and Herbel-Eisenmann (2009) have suggested that we "let students position themselves in various ways and help them recognize that positioning themselves within various storylines in various ways can only strengthen their mathematics" (p. 14). The students in our study address this point in their reflections on collaborative test situations. We hope that all students will have opportunities to experience that every day is a new possibility to grow regardless of how they did yesterday or two years ago, and the students can trust that their teachers will provide such opportunities in a safe space with a good companion/peer with them on the journey.

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