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Pedagogical Tactfulness: A Fundament in Inclusive Mathematics Education

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Situated within the field of inclusive mathematics education, this article presents empirical research from a microethnographic study exploring teacher-student relationships. More specifically, the searchlight was aimed at how math teachers relate to their students when they teach. The classroom study is based on a rich empirical data set collected during a year of field work: video-recorded math lessons, observations and dialogues and interviews in six classes. Four math teachers participated together with 100 students from compulsory school, upper secondary school and schools for children with learning disabilities. Based on a relational perspective on teaching, *Pedagogical Relational Teachership, PeRT,* (Ljungblad, 2018, 2019) a microanalysis was carried out, about how the teacher's acknowledgement to students emerged in interpersonal, face-to-face communication. Through *a relational turn* in mathematics education, exploring interpersonal relationships, an extended relational understanding of situated teaching was acquired. The results illuminated how teachers' *pedagogical tactfulness* emerged as a pedagogical fundament in inclusive educational environment. The results also highlighted a moment of specific importance in mathematics education: at that second, when *the incalculable* (Biesta, 2001, 2007) emerges, the teachers refrain from assessment and, instead, listen and create a space for the students to speak with their unique voices. Over time, such a relational teachership creates *trustful and respectful teacher-student relationships.*

Keywords: a relational turn, mathematics education, pedagogical tactfulness, relational teachership, trustful teacher-student relationship

1. Introduction

Within the field of inclusive mathematics education, this article presents empirical research from a thesis exploring teacher-student relationships (Ljungblad, 2016a). The point of departure is the *Convention on the Rights of the Child, CRC,* (UD, 2006) and the rights of children to participate in democratic educational relationships; democratic in the sense that unique children are given the opportunity to speak with their own voice. Children's rights in education with the school's constant reproduction of inequalities (Biesta, 2009) are reflected in the discussion about inclusion. Throughout history, some students "have been excluded from accessing quality mathematics programs and learning environments" and can thereby be considered having "special rights" for mathematics education (Gervasoni & Lindenskov, 2011, p. 320). By tradition this group is described as students who underperform and ends up carriers of the difficulties of teaching. This goes in line with norms in mathematics education were students "are held accountable for the results of their responsibility taking and outcomes in school" (Sjöberg, 2015, p. 23). Essentially, there is a need for a change of perspectives, with a searchlight on the educational environment, highlighting teaching and the challenge to develop new knowledge about how teachers can meet diversity in mathematics teaching. This challenge concerns both the global research community as well as the local school community. Consequently, inclusive mathematics education has a responsibility to problematize what constitutes quality in education. This article contributes with classroom research exploring interpersonal relational aspects of mathematics teaching within today's schools, in order to create sustainable conditions for each and every student's participation, as a support in a strive for the realization of *the CRC* and children's rights.

2. Special educational needs in mathematics

To approach the question about how teachers can understand and meet diversity in inclusive mathematics education, research from several fields is required such as *mathematical difficulties, special education, mathematics didactics,* as well as *relational pedagogy* (Bingham & Sidorkin, 2004). In the field of mathematical difficulties different disciplines contribute with research, at the same time as a lack of communication exists across various disciplines (Gersten, Clark & Mazzocco, 2007).

Another communicational problem is due to labelling learning disabilities, with a diversity of contemporary definitions defining mathematical learning disabilities and difficulties (Mazzocco, 2007). In a systematic review over four decades of research Lewis and Fisher (2016) argue for a more precise and shared definition of mathematical learning disability to be able to move the field forward.

Mathematical difficulties are a complex phenomenon with a wide range of explanations from researchers suggesting internal, individual factors, to researchers arguing that low performance is a social construct (Magne, 2006; Gifford, 2008). Today, the Scandinavian field of maths didactics is characterized by an understanding that low performance can be both psychological and didactic, which opens up for more inclusive ways when the pedagogical process acknowledges diversity as the norm (Secher Schmidt, 2016, p. 417).

In a systematic review Lunde (2011) divides the field of mathematical difficulties in four explanatory bases. The first neuropsychological explanatory base, focus on how the brain processes numerosities, like Butterworth's (2005) research that shed light on an innate brain representation for small numbers. Specific difficulty in arithmetic can thereby be understood as some children having difficulty in *subitizing* – to perceive a number of objects up to 3-4 without counting. The ability varies among 5-year-old children, where three groups are distinguished: a group with fast subitizing, a group with slow subitizing and a group with an inability to subitize. Children belonging to the latter group, *developmental dyscalculia*, are thus characterized by a basic difficulty to grasp numbers. Another research in this field is Dehaene's "number sense" theory, based on a "mental numberline" for counting (Dehaene, Piazza, Pinel & Cohen, 2005). The second cognitive explanatory base, describes difficulties in mathematics out from general cognitive difficulties (Swanson, 2007), based on cognitive functions like reading and writing skills, phonological processing, working memory or attention (Geary, 2004). However, these cognitive abilities are difficult to assess since mathematics is a complex subject with diverse topics, where different areas in mathematics require different mental processes, as well as cognition being situated (Lave, 1988; Ginsburg, 1997). The third didactic explanatory base, has traditionally focused on individual deviations such as counting errors that need to be diagnosed (Lunde, 2011). Today, there

is a shift towards a focus on the teaching environment and how teachers and students can co-operate and overcome mathematical difficulties (Magne, 2006) with *didactic adaptions* and *relational adaptions* (Ljungblad, 2018, 2019). Critical analysis can also reveal how some didactic methods do not work for students in mathematical difficulties since children have different arithmetical abilit*ies* (Dowker, 2005). In line with such a critical perspective, Neuman (2013) emphasizes teachers' possibility to change approach and culture within early arithmetic teaching (cf. Ma, 1999). Consequently, changing culture can shape a modern arithmetic didactic that encounters diversity among students (Ljungblad, 2016b). The fourth sociological explanatory base, focus on sociological relationships with an interest in social structures, norms, interaction and relationships between teachers and students. Highlighting social dimensions (Zevenbergen, 2000) and expectations in different contexts, can also capture what has value or not in the field of maths pedagogy (Secher Schmidt, 2016). To summaries, the fields of mathematical difficulties and mathematics didactics are wide and complex, and Boaler (2002) argues for an openness to combine different disciplines with socio-cultural insights to encourage new thinking.

Today, in inclusive mathematics education, there is a discussion about quality and how research can support practice, emphasizing the importance of guided and explicit instruction, as well as developing rich learning environments with multiple opportunities (Scherer, Beswick, DeBlois, Healy & Moser Opitz, 2016). During later years, there are three empirical studies about inclusive mathematics in Scandinavia. Secher Schmidt (2015) outlined three dimensions of leadership and compared these against the norms of mathematics teaching. Thereby, teacher proficiencies like *relationship leadership, learning leadership* and *behavior leadership* acquire other values than the traditional norm within mathematics education, which stresses the importance of students as autonomous problem solvers (cf. Popkewitz, 2009). In the second study, Roos (2019) defined processes of participation. What framed and influenced participation was described by three interrelated Discourses; *the Discourse of mathematics classroom setting, of assessment* and *of accessibility in mathematics education*. On one hand, the Discourse of mathematics classroom setting can frame the students meaning of inclusion, on the other hand, the Discourse of assessment can limit the student's participation.

The third classroom research *Tact and Stance – a relational study about the incalculable in mathematics teaching* (Ljungblad, 2016a) explored teacher-student relationships and how math teachers relate to their students when they teach, which is presented in this article. By highlighting social and interpersonal relational aspects of teaching, an extended relational understanding of situated teaching was acquired.

3. Teacher-student relationships

Since the new millennium there has been an increased focus on relational aspects of teaching. In recent years, the teacher-student relationship emerges in international research survey as a factor of great importance, carrying implications for policies, research as well as practice (Wubbels & Brekelmans, 2005; Nordenbo, Søgaard Larsen, Tiftikçi, Wendt & Østergaard, 2008; Hattie, 2009). Late research shows the importance of *trustful teacher-student relationships* (Hattie, 2009[1]; Mitchell, 2014). At the same time, some degree of surprise can be discerned among researchers that a good teacher-student relationship has been taken for granted and not explored to a greater extent.

In a systematic review by Nordenbo et al. (2008), three main teacher competencies are presented*: a didactic teaching competence*, *a leader competence* and *a relational competence* concerning how a teacher enters into social relations in respect of the individual student. Hence, today there is an understanding how these competencies are intertwined in teaching situations, and teachers' relational proficiencies are increasingly seen as reasonable and necessary prerequisites for didactic competency. Relational aspects of teaching can be essential in mathematics since it is "important to realize that the teacher-student relationship plays an important role in students' subject-related attitudes and the manner in which they approach mathematics" (Maulana, Opdenakker, den Brok & Bosker, 2012, p. 42). The way students experience mathematics teachers' interaction, kindness and cooperation can also predict academic outcome (Zijlstra, Wubbels, Brekelmans & Koomen, 2013).

[1] In Hattie's (2009) meta study the effect size for trustful teacher-student relationship was d=0.72.

Research also shows how the teachers' relational proficiencies can be learned and developed in interaction with students (Fibeck Laursen, 2004; Frelin, 2010). This article, based on a microethnographic study, can add to new knowledge by presenting detailed descriptions[2] about how *trustful and respectful teacher-student relationships* emerge over time.

4. A Relational Turn in mathematics education

Historically speaking, educational knowledge traditions and perspectives have centred around either an individual or collectivist focus, but over the last decades *Relational pedagogy*[3] has dawned as a third alternative to the dominate fields (Bingham & Sidorkin, 2004; Aspelin, 2014). This approach, where teaching is to be understood relationally, shifts the spotlight from individuals, groups and their practices, onto the relationships between the participants. Or to put it succinctly, a shift from mind to intersubjectivity, since in a relationship we become somebody (Gergen, 2009).

Since the new millennium, when Lerman (2000) first introduced *a social turn* in mathematics education, different kinds of social and relational aspects have been highlighted such as: (i) the relation between mathematics education and the society (Alrø & Skovsmose, 2002; Wedege, 2010), (ii) the student's relation to mathematics as a subject (Boaler, 2008), (iii) the relation between gestures, bodily actions and the student's sensuous aspects of thinking (Radford, 2009), (iv) the relation between different aspects in the complex teaching environment (Schoenfeld, 2013) and so on. However, this classroom research explores the *interpersonal relationship* between students and teachers, which can be seen as *a relational turn* in mathematics education. By exploring complex relationships and interactions between persons this study contributes to knowledge to the field of philosophy of mathematics education (Ernest, Skovsmose, van Bendegem, Bicudo, Miarka, Kvasz & Moeller, 2016).

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2 An in-depth reading can be found in the thesis (Ljungblad, 2016a, pp. 163-230).

3 In the field of *Relational pedagogy* two new research networks have been established, the international network *Relation-Centered Education Network,* RCEN, and *Nordiskt nätverk för relationell pedagogik, NoRP*.
https://sites.google.com/view/pedagogyofrelation/home
https://www.hkr.se/forskning/forskningsmiljoer/forskning-relationell-pedagogik-forp/norp---nordiskt-natverk-for-relationell-pedagogik/

Moreover, students' relations to the world, the subject and the group, is not the same relational view on teaching as focusing on interpersonal teacher-student relationships; they simply have different relational points of departure. Relational pedagogy is a theoretical perspective based on the concept of human beings as relational beings and about teaching as relational processes, and places relationships between teachers and students at the centre. This new approach in educational theory rests on diversity and pluralism with philosophical roots derived from intersubjectivity philosophical tradition (Arendt, 1998; Levinas, 1998; Buber, 2011). Still, the field of relational pedagogy is fairly young when it comes to empirical research.

Within the fields of inclusive education and relational pedagogy, *Pedagogical Relational Teachership, PeRT,*[4] (Ljungblad, 2018, 2019) is a new multi-relational perspective on teaching and education that can enrich and expand our understanding of relational processes and educational relationships. Based on the model on how Ljungblad (2016a) operationalised a relational perspective on teaching, PeRT was developed to a multi-dimensional model that can be used in classroom research. PeRT's first dimension is based on *the CRC* (UD, 2006) and *the Salamanca Statement and Framework for Action* (UNESCO, 1994).

[4] In Swedish, *Pedagogiskt Relationellt Lärarskap, PeRL*.

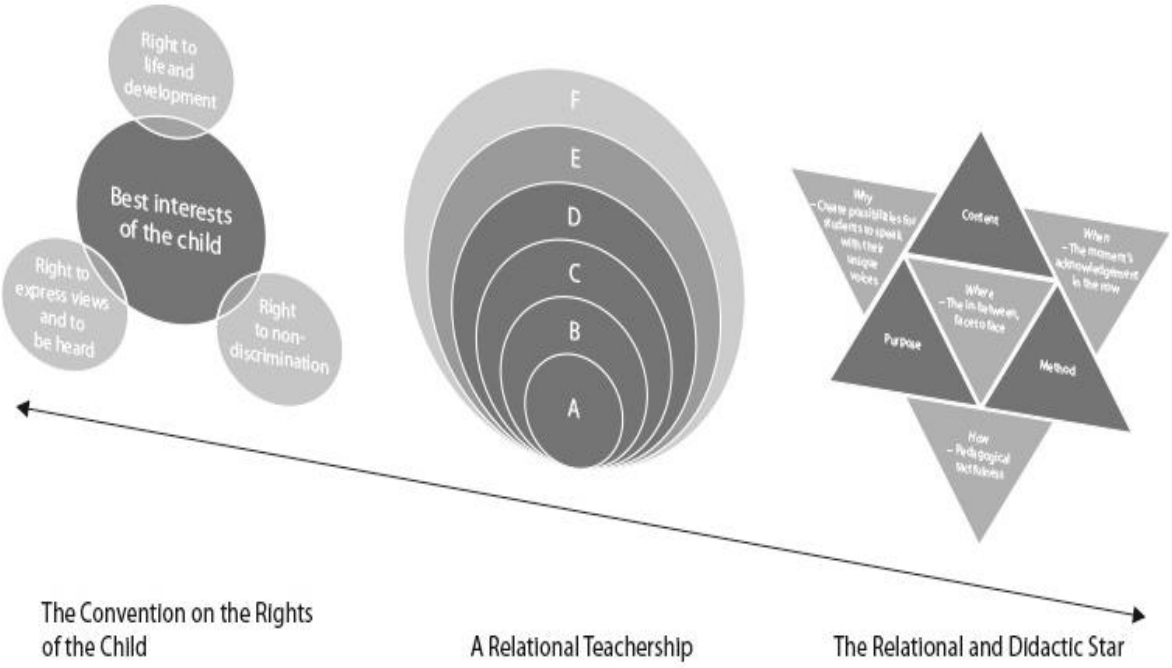

Figure 1. The composite model shows the flow between the different dimensions of PeRT.

The second dimension of PeRT's model reveals different aspects of *a relational teachership*. This part of the model is inspired by Bronfenbrenner's (1979) bioecological model; however, it has another focus highlighting interpersonal relational processes within the education system. There is also a different ontological point of departure (A), which emphasises *the relationship as primary*. This second dimension illuminates the micro-level (B, C, D) with different aspects of a relational teachership. B, can zoom in on the interactions between teachers and students. C, explores the teachers-student relationship. Furthermore, D problematizes relational aspects of what it means to teach and be a teacher. There follows, the meso-level (E) and how the school staff communicate and organize the education. Last but not least, the macro-level (F), illuminates the societal level of the educational system with political intentions, laws, research and global influences.

In the third dimension of the model, school subjects and didactic aspects are distinguished in teaching. Throughout history, mathematic knowledge has been developed in dialogue between people sharing different ideas and aspects, that finally resulted in new knowledge (Ljungblad & Lennerstad, 2011). It is also in communication and dialogue knowledge continues from one generation to another generation (Vygotsky, 1978; Säljö, 2014). When children and young people are participating in mathematical work, there are diverse ways on how students make personal interpretations (Ljungblad & Lennerstad, 2011). This is one facet of diversity in mathematics that teachers face every day. In order to create an extended relational understanding of situated teaching the didactic triangle was expanded to a *Relational and Didactic Star*.

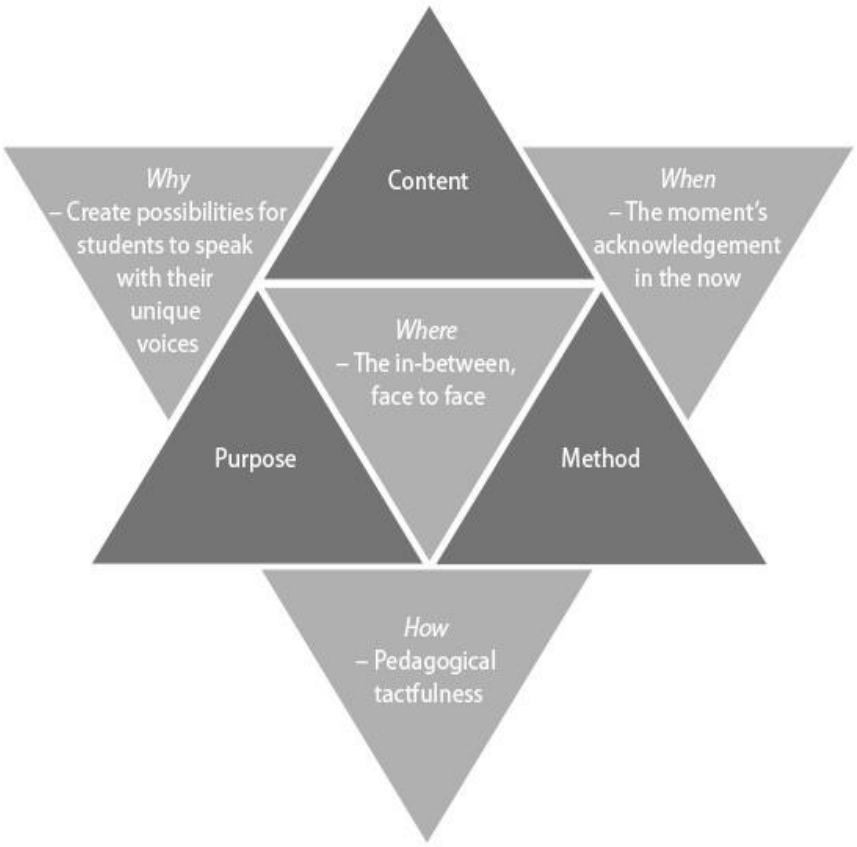

Figure 2. The *Relational and Didactic Star*.

The didactic triangle (Zittoun, Gillespie, Cornish & Psaltis, 2007) focuses on *the purpose, content* and *methods* of teaching, together with the classic *didactic questions*: (1) *why,* clarifies the purpose of studying a particular subject, (2) *what,* addresses the content of teaching and (3) *how,* problematises processes and methods in teaching. But the didactic triangle does not illuminate the interpersonal aspects of participating in the teaching community. This classroom-based study that explored how the participating teachers relate to their students when they teach, has enlightened the importance of relational values like *trust* and *faith*. Such relational proficiencies defined as *a relational teachership* (Ljungblad, 2018, 2019), can be seen as a fundament in inclusive mathematics education. In addition, *the Relational and Didactic Star* was developed to illuminate both the didactic dimension and the relational dimension of teacher's proficiencies. Besides the didactic questions the Star also includes *relational questions*. The four relational questions – *why, where, when* and *how* (Ljungblad, 2016a, 2018, 2019) highlight different aspects of the student's *subjectification*; a relational dimension that explores how young people can emerge and speak with their own voices, and how their beginnings are taken up by teachers (Biesta, 2009):

Why – to create possibilities for students to speak with their unique voices.
Where – the in-between, the space between teacher and student, face-to-face.
When – the moment of acknowledgement in the now.
How – pedagogical tactfulness.

The Relational and Didactic Star clearly shows how pedagogy and didactics converge in the moment of teaching. To be able to explore different relational aspects of teaching, one can zoom in on one of the levels in the three-dimensional model, and then zoom out and analyse them together. This article zoomed in on the micro-level presenting empirical research on how teachers relate to their students when they teach, and how this acknowledgement[5] to students emerged in interpersonal, face-to-face communication with students.

[5] Acknowledgement is an existential term. The teacher is *being addressed* by the child, by another human being. It lies with the teacher to acknowledge this person's existence and to acknowledge otherness and differences (Biesta, 2012).

Furthermore, this study did not use common special pedagogical discourses. Instead, I was theoretically inspired by Biesta's (2001, 2007) *the incalculable,* as an alternative approach in the field of inclusion, the study empirically explored teaching and particularly its most complex dilemma situations. *The incalculable* is a new way of seeing teaching and education based on diversity, where a person is not excluded from an existing order. PeRT takes the point of departure from *otherness* and *différance*[6] (Säfström, 2005) and explores the conditions for student participation and how teachers can meet diversity. Différance is one way of approaching education based on the lived experiences that – you are different from me and I am different from you. This goes in line with Skovsmose (2015, p. 7) emphasizing how inclusive mathematics education can "refer to new forms of providing meetings among differences". Accordingly, PeRT emphasizes sustainable interpersonal relationships that can support student participation and student growth (Ljungblad, 2018, 2019).

5. The design of the study

The overall aim of this microethnographic classroom study (Ljungblad, 2016a) was to empirically explore the teacher-student relationship in education. The study examined *how teachers relate to students* when they teach, and how this acknowledgement to students emerged in interpersonal, face-to-face communication with students. How teachers' interpersonal communications emerge and can be understood in teaching was examined by the following research questions: (i) How does the teachers' acknowledgement emerge in interpersonal communication with students? (ii) What dilemmas arise in teachers' interpersonal communication? (iii) What relational language use evolves when teachers express what it means to be and work as a teacher?

Four math teachers and 100 students from compulsory school, upper secondary school and schools for children with learning disabilities participated. The selection of the teachers was considered positive based on former students expressing how these teachers meet students in a secure way that supports student's development. *Pia* worked as a math teacher in fifth and sixth grades in the compulsory school.

6 The notion *différance* originates from Derrida (2003).

Hans-Olof taught at the Natural science program in upper secondary school. *Ingrid* was a special education teacher within the Introductory program of upper secondary school; students assessed within the autism spectrum, sometimes diagnosed with combinations of different learning disabilities were admitted to her class. *Maria* worked as a teacher at the Individual program of upper secondary school for learning disabilities. Her three students had severe vision impairments and learning disabilities and used wheelchairs. The students had been assessed for intellectual challenges with communication difficulties, and a lack of spoken language. The different educational environments of the four teachers portray a broad and deep selection of diverse teaching situations.

The research design included different parameters with the intention of probing the complexity of teaching: *different school forms, varying forms of teaching, teaching from beginner to more advanced levels* and *the aspect of time*, which is crucial in relational studies when comparing new relationships with long-lasting relationships. The participants were followed during twelve months with video camera to get a close look at teacher and student interactions; at times no more than one meter away, interactions, gestures and facial expressions were able to be captured. 25 lessons with a duration of 60-90 minutes were recorded. In the afternoon, the teachers also participated in *meaning-making dialogues*, where the teachers had the opportunity to view the recorded video sequences, and to articulate how they relate to their students. These sessions were also video recorded and the duration varied between 45-70 minutes. Finally, in the end of the field work interviews with the participating students were carried out.

Overall, the study specifically explored dilemma situations in math teaching, which can be understood as *incalculable scenarios* (Biesta, 2001, 2007, 2012). Such dilemma situations could be vulnerable scenarios when a student showed insecurity or fear, or when a student expressed or did something that the teachers rarely encounter. Of specific interest was, how the teachers related to their students, when the teacher had no method or routine for how to handle the dilemma situation. From a child's rights perspective (UD, 2006), such scenarios were surveyed to find out if the students were given opportunities to speak with their own voices and emerge as unique people (cf. Boaler & Anderson, 2018).

After the fieldwork, profound microanalysis was carried out in five steps (Ljungblad, 2016a, p. 261). In the analysis process the relationships was placed at the center of analysis, with a triangulation across

the empirical data from all the six classes. The interpersonal communication, when teacher and student meet face to face, was explored. This place, *the in-between,* is the gap where education takes place (Biesta, 2001, 2004). The teachers' way of relating to their students was understood in terms of *pedagogical tact* (Lövlie, 2007); this acknowledgement emerged as an adaptability that touched the students and was captured in a movement, a gesture, a glance and a tone of voice. Lövlie's view on tact, is based on *humanity* and *democracy* and emphasizes people's participation in community. In accordance with the results in the thesis (Ljungblad, 2016a), detailed descriptions of the lived life in the classroom was presented. A key result in the study showed no differences between how the four teachers related; they related in a similar way and over time *trustful and respectful teacher-student relationships* emerged. In the results from the microanalysis eight themes took shape: *tact, an incalculable tact, contact, tactfulness, meeting the incalculable, curiosity, pathfinder* and *responsible considerations*. The analysis of parts of a whole was further depended, and two dimensions of Lövlie's tact exemplify teacher acknowledgement, i. e. *Pedagogical tact* and *Stance*. Thereby, the analysis process deepened a relational understanding of situated teaching in mathematical environments. Some of these findings about pedagogical tactfulness is presented in this article.

6. Pedagogical Tactfulness in situated teaching

The microethnographic study (Ljungblad, 2016a) has a profound empirical data production based on video recorded math lessons, observations, dialogues and interviews in six classes, during a year of field work. The social and relational characteristics of the teaching follows an in-depth microanalysis, first, *differences as the starting point*, followed by, *pedagogical tact,* and finally*, pedagogical tactfulness.*

6.1 Differences as the starting point

In the participating teachers' math classrooms some general aspects of situated teaching were captured. The four teachers were different in their personalities and had found their own way of teaching. Consequently, the teacher's personality could not shed light on how they relate to their students (Fibeck Laursen, 2004; Frelin, 2010). In their lesson planning the students' differences were the basis of the teaching while there always was room for improvisation. One typical character of the teaching was how the teachers and students were involved in mathematical discussions during the entire lesson. This resulted sometimes in a high level of sound, but still the participants had breathing space and were involved in concentrated work. As an illustration, there was an open dialogue between teachers and students with a warm and permissive atmosphere. Other characteristics displayed how the teachers took an interest in each and every student and challenged the students to try new math problems, at the same time the teachers had to deal with students feeling of frustration and secure. The students described this way of support as being *pushed* in a positive way from the teacher who believed in their potential, in contrast to being pressed.

Furthermore, in these classrooms, diversity was the point of departure when the math teacher welcomed different ways of thinking and solving math problems, like in the next scenario where Hans-Olof encouraged a student, Love, who hesitated to speak out and participate in a problem solving:

> H-O – Different ways of thinking is beautiful; he says calmly and looks Love in the eyes.
> – Let´s try your thought!

Such an acknowledgement, encouraged Love to speak out and present his ideas. These findings can be seen in line with a *dialogical discovering paradigm* where the process is in focus, in contrast to a *right-answer paradigm* where teachers and students focus on the product (Ljungblad & Lennerstad, 2011; cf. Alrø & Skovsmose, 2002). The teachers also emerged as *a Pathfinder* showing the students different ways to explore when they solved math problems (cf. Boaler, 2008). However, it was the students themselves who choose what way to try. Hence, in this exploring process the teacher stood by the

students' side, and over time the teacher-student relationships emerged as *We,* which is a relational alternative compared to the norm where students in mathematics education are supposed to live up to the norm of autonomous problem solver (Popkewitz, 2009). In line with such an approach, Pia, Hans-Olof, Ingrid and Maria recognized student autonomy more as a final destination and a value at the end of math education. In these six classes the participating students also reached high grades in relation to their prerequisite (Ljungblad, 2016a, pp. 155-156). Last but not least, the participating teachers emphasized a *twofold responsibility*, being responsible for both the teaching, as well as the relationships to their students (cf. Ernest et al., 2016), which *relieved the student from being the bearer of teaching problems.*

6.2 Pedagogical Tact

In mathematics teaching, relational scenarios and their rapidly changing natures are hard to capture. However, the results showed a consistent pattern in all four math teachers' way of relating to their students in ways that created *trust* and *respect.* During the year, the four teachers created close relationships to their students, which took both time and energy. In the end of the fieldwork, the students also described the relationship to their teachers as *trustful and respectful teacher-student relationships* (Ljungblad, 2016a, p. 237). After a profound microanalysis, a key result showed no difference between the teachers' pedagogical tact with regard to students' varying ages, levels or school forms. *Relationally, there is no difference* (ibid., p. 178, 265). In line with these findings, it was important to derive more specific knowledge about how the teachers related to their students in ways that created *trust* and *respect,* in creative environments promoting student growth. How did these teachers actually relate to their students, in the moment of teaching?

In the beginning of the fieldwork, the teachers came to the insight that they were unaware of how they related to their students. When they looked at video sequences over their lessons they exclaimed: "I had no idea I relate to my students like that!" This can be explained in terms of the teachers focusing on their didactic lesson plans when they teach, with no time to reflect upon the relational dimension of the profession. Even though, the teachers did not have time to reflect on how they relate to their students, they felt with their senses if the interaction with the student was progressing; if something

occurred and the flow in the interaction stopped, then the teachers started to reflect. This way of relating, as a *relational teachership* (Ljungblad, 2018, 2019), goes beyond the discourse of *the reflective practitioners* (Schön, 1995) and can be understood as an *aesthetic art* (Ljungblad, 2016a, p. 243). Pia, Maria, Ingrid and Hans-Olof put into words how this *hidden proficiency* had been developed in their relational work together with former students. Furthermore, the teachers' *pedagogical tact* turned out to be *incalculable*, since it cannot be planned in advance and needs to be improvised in the moment.

In teaching situations, the four math teachers' way of relating sought to create *con-tact*[7] with the students. This can be understood as a tact *with* the student (Ljungblad & Rinne, 2020). Usually, there was a flow in the dialogue between the teacher and the students and they looked relaxed. However, in dilemma situations, for example, when a student showed signs of insecurity and did not how to solve a math problem, the teachers' tact shifted; the teacher turned his or her head to one side, seeking to catch the student's eye and spoke in a softer and more cautious tone than before. Other shifts of tact included changes in the teacher's tone of voice when the teacher's positive tone revealed humour or played down a problem; such tact eased tensions in the atmosphere. In dilemma situations, the teachers left their lessons plan, were flexible and sensitive and followed the students' different ways of being and working with *improvised shifts of tact*. This way of relating to students at crucial teaching situations encouraged the students to ask questions and speak with their own voice.

The next scenario illuminates Hans-Olof's pedagogical tact, and his gesture and movement, face to face, together with three students Charlie, Leonard and Jason. According to the teacher, they were very different students, which he described in the following way. Jason attended a specialized sports program and took the mathematics course with Hans-Olof's class. He was an active boy with a strong self-confidence and a high status in the class. Charlie was also an active student who often asked questions and liked to discuss things with the teacher and his classmates. Leonard, on the other hand, never took an initiative to talk to the teacher or other students.

7 Latin *con* – with.

When the teacher taught, he did not take notes, only listened, sometimes with closed eyes and his head resting in his hands. The teacher interpreted this as a student in special needs who had his own way of learning. Throughout the autumn term, Leonard was always quiet in the classroom and in the next scenario he had not yet asked his teacher for help. During this lesson Leonard and Charlie share the same table by the window and in front of them sits Jason:

Hans-Olof walks around the classroom and talks to students who ask for support. When he comes back to the window Leonard suddenly shows his book to the teacher. Leonard is quiet, seeks no eye contact, looks down and points to a page in the book.

47:45 Hans-Olof bends down to see what Leonard is pointing at. Leonard says nothing and instead Charlie asks a question related to the page. Hans-Olof bends up again in a straight position and turns his face to Charlie and they start an intense dialogue, while Leonard is listening. Jason overhears the discussion, turns his chair backwards and starts participating. Hans-Olof then turns slightly to the right towards Jason. Now, the discussion continues between Hans-Olof, Jason and Charlie with their faces directed towards each other.

49:06 Suddenly, Leonard says something quietly. The other three persons react immediately, become silent and look at him. Now, Hans-Olof turns his body to left, bends deep down towards Leonard, looks him in his eyes and asks with a smile and quiet tone.

H-O – What did you say? He keeps eye contact with Leonard for a few seconds.

Leonard repeats his question with a brief glance at the teacher before he looks down again. Hans-Olof answers, nods and smiles. Leonard looks up and smiles back. Now the discussion continues between the four participants and their postures and faces are directed towards each other.

On another occasion, when Leonard says one more thing, Hans-Olof once again bends down deeply towards him with a smile and talks in a soft tone of voice, in contrast to when he talks to the other two boys with straight body posture and a normal tone of voice.

The Tact in the Situation: In this scenario[8], there is something particularly interesting that Leonard has read and wants to discuss, which ends up in a dialogue between three boys and their teacher. It is a unique teaching situation, when a student in special needs for the first time approaches his teacher. When Leonard suddenly asks a question, Hans-Olof actively seeks contact with him, wishes to meet the student and come closer to him. The teacher's gesture, a deep forward bend (49:06) towards the student, has the character of *hospitality* and welcomes him as a person into dialogue. Essential is also, the teacher's facial expression, open glance and tone of voice, in a curious *stance* that wonders *Who* the student might be (von Wright, 2006), as an invitation to Leonard to participate in a mutual dialogue in the classroom. The teacher's posture shows a welcoming gesture that opens up the dialogue so that the interpersonal communication now can flow between all four participants.

In the afternoon, Hans-Olof participated in a meaning making dialogue and we looked at the film sequence with focus on Leonard, Charlie and Jason. He clarified Leonard's background in the following way:

> This is about communication difficulties. He is very lonely. But... in the classroom is he never alone. The classmates sit down beside him and he sits down beside them. However, in the corridor he is always by himself. When I see him sitting alone on a bench, I usually sit down together with him and talk a little. He only answers: yes, hm... He's lonely because of communication difficulties... But here, in this scenario, there was something particularly interesting he wanted to tell the others boys and me. He had read about CERN and the way they collide nuclear particles which leads to quarks and energy… He had read about that and he was apparently interested in this. Then I wanted... Now I saw how I related [on the movie]. I wanted to get close to him and really... meet him.

8 For a fuller picture, the microanalysis in the thesis presented detailed depictions of how the teachers related to their students (Ljungblad, 2016a, pp. 163-230).

To conclude, in this teaching scenario, the teacher's acknowledgement towards Leonard differs from the other two students, and illuminates improvised *shifts of tact* towards a student in special needs, in a fragile situation. This result has similarities to Radford and Roth's (2011, p. 244) concept *togethering*[9]. These findings, give a relational understanding about the importance of teacher's gestures, facial expression and tone of voice and how the *teacher's tact* in different situations can create an inclusive atmosphere.

6.3 Pedagogical Tactfulness

Over time, the four participating teachers created educational environments were *trustful and respectful teacher-student relationships* evolved. Still, a constant pedagogical balancing act was required in teaching. By exploring how teachers relate to their students, the results illuminated how the relational and the didactic dimensions of the teacher profession are closely intertwined (Ljungblad, 2016a, 2018, 2019). The microanalysis clearly showed how didactics and pedagogy converge in the moment of teaching and gives an extended relational understanding of situated teaching. In the empirical scenario above, the teacher and three students were involved in the same dialogue about one topic. However, the teacher's tact differed when it touched the three boys, because different kinds of relationships had developed between the teacher and his students, as well as the students showed different needs of support. The balancing act in the moment of teaching, is about how to handle the two dimensions of the teaching profession; *the didactic dimension* of teaching which consists of reflection with a focus on a topic, as well as *the relation dimension* of teaching which is to a greater extent unreflected and improvised based on senses. The complexities of *relational teachership* (Ljungblad, 2018, 2019) give insight into how teachers need to find their own way of relating, and improvise in the moment during face-to-face interactions with students.

9 Within the mathematic education research, I find Radford's and Roth's (2011, p. 244) description of cooperation between teacher and students interesting. They use the concept *togethering* which includes *co-knowing* and *co-being*. This relates to the relational field and Aspelin's (2014) concepts *co-operation* (sam-verkan) and *co-existence* (sam-varo). However, these concepts come from different theoretical fields and have different ontological positions.

In conclusion then, *pedagogical tactfulness,* is about how the teacher in a situated moment with focus on a topic, relates in diverse ways to different students because of different kinds of needs. The interviews with the students bear witness of how such pedagogical tactfulness can be particularly decisive for students in special needs and socially vulnerable students (Ljungblad, 2016a).

In today's school environments, teachers need to be able to handle relational dimensions of meetings between people in different teaching scenarios. By exploring a relational understanding of situated teaching, with a focus on dilemma situations, the findings highlighted a moment of particular importance in mathematics education. In that second, when the new and *incalculable* appeared and the students talked with their own voices, the teachers showed a *tolerant and unjudgmental stance,* where the new that the student brought forward could pass into the dialogue. In that moment, the teachers listened to the student and refrained from assessment; such an empathetic and listening pedagogical stance searching for *Who* (von Wright, 2006) the student might be, gave the students possibilities to speak with their unique voices. Furthermore, when the teachers showed engagement, for the students' *intellectual freedom* by caring, the students could spontaneously, freely and creatively participate in ways that was interesting and meaningful for the student (cf. Boaler & Anderson, 2018). At the same time, the teachers recognized how the student needed both *freedom* and *security* in order to dare to speak out with their own voice and think freely (Ljungblad, 2016a). To conclude, the results indicated how teachers' *pedagogical tactfulness*, in a *stance* of responsibility*,* can meet diversity and create space for the students to emerge and speak with their own voices.

7. Discussion

Teaching is a social and relational art that deals with children's being and becoming. Acknowledging *a relational turn* in mathematics education, exploring interpersonal educational relationships through a relational perspective on teaching, *Pedagogical Relational Teachership, PeRT* (Ljungblad, 2016a, 2018, 2019), an increased relational understanding of situated teaching was created. The empirical results have illuminated how the didactic and relational dimensions of the teaching profession are closely intertwined, in the moment of teaching. Teachers' way of relating to their students, is ever present in

situated teaching; the teachers' pedagogical tactfulness emerged as a pedagogical fundament that can create an inclusive educational environment. Consequently, all teachers need to develop a relational teachership in interaction with their students. A trustful and respectful teacher-student relationship is essential for student's growth (Wubbels & Brekelmans, 2005; Nordenbo et al., 2008; Hattie, 2009; Ljungblad, 2016a), since in a relationship a child can become somebody (Biesta, 2001, 2007; Bingham & Sidorkin, 2004; Gergen, 2009). The teachers' pedagogical tactfulness animates pedagogical meeting between a teacher and a student, as a person to another person. Such personal meetings based on diversity (cf. Abreu, Gorgorió & Björklund, 2018), when teachers encounter diversity, face-to-face, highlight relational qualities of inclusive education. It also gives an understanding about how subjectification (Biesta, 2009) brings something radically new into the world. In line with such educational environments celebrating diversity and differences (Säfström, 2005), children can emerge as unique beings and engage in democratic educational relationships.

Highlighting children's rights (UD, 2006), I advocate for a change of perspectives, from a traditional discourse on learning where children are described as underperforming, to a new discourse on education problematizing how the educational system can hold high quality for each and every child (Biesta, 2009). This goes in line with Boaler and Anderson (2018) underscoring the Rights of the students in mathematics education, as an important framework for teachers to promote a positive teaching environment. One quality that was exposed in the microanalyses, is a second of most importance in mathematics education, the moment when the new and *incalculable* emerges in practice (Biesta, 2001, 2007). When teachers in that moment, take a two-fold responsibility for both the content and the relationship to their students, the student is relieved from being the bearer of teaching problems. Such *a stance* from the teacher creates new possibilities for students to influence their own participation, even in dilemma situations.

> From a child rights perspective (UD, 2006) such a pedagogical stance of responsibility reflects a facet of ethics that can be viewed as *lived ethics,* in that the teachers actively acknowledge and strive to meet unique children in the education. (Ljungblad, 2016a, p. 270)

8. Conclusion

One of the global challenges, about quality in inclusive mathematics education is about how the educational system can encounter diversity (cf. Valero, 2012). However, "A fog of forgetfulness is looming over education: Forgotten in the fog is that education is about human beings" (Bingham & Sidorkin, 2004, p. 5). This dilemma rises a philosophical question about what values underline the nature of mathematics teaching (Ernest, et al., 2016) and emphasizes an ethical commitment for the mathematics community (Radford & Roth, 2011).The microanalysis of the complexity of the relationships between teachers and students also gave insight about, how today's discussion concerning evidence-based teaching and the importance of the leadership in the classroom, cannot fully grasp all aspects of teaching. Essentially, daily meetings with unique children can never be evidence based, therefore the concept *relational teachership* (Ljungblad, 2018, 2019) can be used in the discussion about what constitutes quality in inclusive education from children's perspectives (UD, 2006).

In the *age of measurement* (Biesta, 2009), where students at an increasingly early age are faced with national testing, the rational voice is dominating. As a counterweight in this neoliberal landscape, it is important to highlight the relational voice about sustainable interpersonal relationships, existential aspects and relational values that can enrich the educational process. The empirical classroom study (Ljungblad, 2016a) bear witness of *a relational alternative*, verifying how the participating teachers already have developed a successful relational teachership, which gives hope for a possible change.

To conclude, throughout history, the school's constant reproduction of inequalities is a question about equity (Radford & Roth, 2011). Today there is a need for another kind of inclusion where a child is not excluded (Biesta, 2009); such educational environments are based on diversity and need to develop didactic and relational proficiencies that meet diversity. PeRT (Ljungblad, 2018, 2019) is an inclusive perspective that takes the starting point from such a view on teaching searching for new possibilities about *togetherness in plurality*. In a strive for the realisation of children's rights (UD, 2006), I emphasise, how student participation in relational educational community that actually meet diversity – can be understood as a necessity in a humane and democratic way of life.

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