Exploring Classroom Inequalities in a Mathematics Class through a Capabilities-Based Social Justice Framework

Matematik Derslerindeki Sınıf-içi Eşitsizlik Durumlarının Yapılabilirlik Yaklaşımı Çerçevesinde İncelenmesi

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ABSTRACT: This paper aims to examine classroom justice through a capabilities-focused praxis. The research employs a case study design to explore inequalities in a classroom environment in Turkey. Data are drawn from in-depth individual interviews with six teachers working at the secondary level of primary school and from their classroom observations for one academic term. We monitored teacher-student and student-student interactions, and strategies for coping with inequalities and conversion factors (such as training, teacher behaviour, skills, power relations) that affect teaching and learning processes. We then looked into the conditions that limit student capability to participate in class, do well on exams and benefit from learning. The study lists the conditions of inequality and maps out a new capabilities direction to examine classroom inequalities in Turkey. These capabilities can be listed as: capability to access (appropriate) learning materials; capability to access the teacher; capability to have a democratic classroom environment; and capability to access appropriate teaching and pedagogy for different learning styles and needs.
Keywords: Social justice, classroom inequalities, capabilities approach

ÖZ: Bu araştırmanın amacı sınıf-içi adalet kavramını yapılabilirlik yaklaşımı kapsamında incelemektir. Araştırmada Türkiye'deki sınıflarda bulunan eşitsizlik durumları vaka çalışması yardımıyla ortaya konulmaya çalışılmıştır. Veriler altı ortaokul matematik öğretmeniyle yapılan bireysel görüşmeler ve bir akademik dönem boyunca gerçekleştirilen sınıf-içi gözlemler aracılığıyla elde edilmiştir. Araştırmada öğretmen-öğrenci, öğrenci-öğrenci etkileşimlerine öğretmenlerin eşitsizlik durumlarıyla başa çıkma stratejilerine ve öğrenme-öğretme süreçlerini etkileyen faktörlere (öğretim, öğretmen davranışları, beceriler, güç ilişkileri gibi) odaklanılmıştır. Ayrıca, öğrencilerinin sınıf-içi katılımlarını sınırlandıran, başarılarını ve öğrenmelerini olumsuz etkileyen şartlar incelenmiştir. Elde edilen verilerin analizi sonucunda, sınıf-içi eşitsizlik durumlarını ortaya koyan dört önemli tema ortaya çıkmıştır: (*i*) öğrenme materyallerine erişim; (*ii*) öğretmene erişim; (*iii*) demokratik sınıf iklimi ve (*iv*) öğrencilerin farklı ihtiyaçlarını göz önünde bulunduran pedagojilerdir.
Anahtar Kelimeler: sosyal adalet, sınıf-içi eşitsizlik, yapılabilirlik yaklaşımı

1. INTRODUCTION

This paper aims to explore inequalities and injustices in a mathematics classroom through a capability-praxis of social justice framework, which could form the basis for educational policy making and teacher education. We take maths classes as a case to look into classroom inequalities because Programme for International Student Assessment (Pisa) and Trends in International Mathematics and Science Study (TIMSS) results show that a large inequality gap exists among students in mathematics achievement. Additionally, the results of national exams in Turkey display great inequalities among students (e.g., students from a lower socio-economic class are likely to achieve less than others). Indeed, justice and the maths classroom is a broader global problem being examined by researchers (Burton, 2003; Gutstein, 2006). The low success of students or the inequalities in these classes is often associated with the microteaching practices of teachers such as discriminatory pedagogical approaches, a lack of culturally relevant approaches and the absence of empowering teaching strategies that develop student agency through participation (Brown, 2009; Leonard & Moore, 2014). Therefore, there is a need for teachers to understand their role in the

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"existing systems of power and privilege" (Cochran-Smith, 2004, p. 2) so that they can better identify the inequalities in the classroom. However, equality issues are often given little attention in maths class because there is too much focus on mathematics content (Heid, 2010; Martin, Gholson, & Leonard, 2010). Therefore, the primary goal of education, which is to provide every student with equal access to the opportunity to learn, is ignored. However, it is important for the needs of different individuals to be taken into account. In this respect, it must be noted that some individuals may need more resources (such as time, material, attention) than others to reach the same level of learning, although such an attitude may appear to be or may be interpreted as "being unjust" to other students.

We acknowledge that there is extensive work on teaching for social justice in maths education with the aim of creating "a classroom environment that ideally supports student inquiry into and understanding of inequitable power relationships in society while helping students become effective voices for change" (Garii & Rule, 2009, p. 490). However, we argue that when there is no equality in a (maths) classroom, teaching for social justice may not mean much or may not bring the revolutionary change expected. What is needed is to increase the quality of education by examining classroom interactions, gendered processes of teaching and learning, gendered hierarchies of knowledge and the intersections of language, culture, and ethnicity (Unterhalter, 2007). This paper therefore considers how to apply the capability approach to unearth the conditions of classroom inequality or identify the opportunities that affect the conversion of capabilities at students' disposal into valuable achievements for classroom justice; it has a particular focus on equity and it draws conclusions from an empirical case. The aim of identifying such inequalities is to lead to improvements in education quality and to increase students' participation in learning.

To serve this aim, first, we examine the studies in equity and social justice addressing maths classes to tease out the genuine concern for equality and then present the theoretical and practical applications of the capabilities framework to identify inequalities in the classroom. This is followed by a description of the empirical methods and the findings. Lastly, the paper concludes by discussing how the promotion of capabilities within the classroom environment can affect the provision of education equality.

1.1. The Capability Approach and Equity in Education

The capabilities approach, developed by Amartya Sen (1993), is a broad normative approach based on the foundational idea of human dignity and oriented to gender and wider social justice. It is used for the evaluation and conceptualization of social arrangements, well-being and the design of policies addressing social change in society. Sen's (1983) capability approach argues that freedom is affected by social, economic or environmental arrangements such as poverty, lack of social and care facilities, cultural norms or the denial of civil liberties, which lead to 'unfreedom' and affect the exercise of freedoms. Sen develops his ideas through two major concepts: functionings and capabilities. Functionings are the reasonably valued beings and doings of a person - such as working, resting, or being healthy. Capabilities are the various combinations of functionings that a person holds the potential to achieve (Sen, 1993), such as having the conditions for freedom of speech or having the conditions (hospital, healthcare workers) to recover from an illness. Thus, Sen's capability approach is concerned with the capabilities of people and the freedom to lead their lives in a way that they regard to be good.

The following example provided by Cin (2014:70) shows that the evaluation of equality should focus on the freedom of opportunities and choices and the extent to which people have genuine access. "For instance, two girls from Turkey sitting for the university entrance exams fail to get a placement. One comes from a wealthy family from Western Turkey where she has access to teachers, private courses and books and so forth. The other comes from a poor background and needs to take care of the household and looks after her younger siblings. In

addition, she has no access to private courses or the necessary books and cannot attend school regularly due to her domestic responsibilities. The former failed because she was not interested in studying, whereas the latter was deprived of the necessary resources and had little time for preparation." This example shows the functionings of both girls are the same but the capabilities are different. What matters is that inequalities should be addressed individually at different levels in a way that does not lead to injustice. In other words, as stated in the example above, the girl with few opportunities needs more resource opportunities or should have the same real opportunities for valuable doings and beings so that the inequality she holds can be addressed.

The capability approach has been well-adopted to education studies to evaluate educational inequality, to question the real educational choices available and to look into the extent to which children are free to participate in education (Unterhalter, 2007). A significant aspect of the approach is that it addresses the multiple perspectives of gender (equality) in education such as intersectionality, gender discrimination related to learning, and the impact of curriculum and textbooks on the reproduction of stereotypes about women and men (Aikman et al., 2011; Unterhalter, 2007). In relation to this study, the approach is particularly used for social justice research in education because it looks at how schools reproduce inequalities and social injustices through maldistribution and silencing but also examines how school conditions and learning sites offer resources through which learners can challenge inequalities. The approach not only pays attention to the outcomes of inequalities but is also concerned with how the school can create a transformative space to contribute to fostering social justice. Motivated by the value that capabilities could add to the study of equality in education, educational theorists have engaged in discussions and debates on how capabilities could be used, on what they could offer in terms of the social justice and education literature and on how they could address gender/social inequalities in education as policy and practice (Aikman & Unterhalter, 2005; Tikly & Barrett, 2013; Walker, 2006; Walker & Unterhalter, 2007; Vaughan & Walker, 2012).

However, little research has been performed on social justice at the classroom level, and many of these studies have been limited to concern regarding gendered, class or inequality regimes such as gender/ethical biases in curricula, gendered beliefs about girls' learning and education, and gendered stereotypes in school or bias/prejudices against particular ethnic identities (Raynor, 2008; Stromquist, 2007; Skelton et al., 2009; UNICEF & UNGEI, 2008). These studies touch upon girls and boys learning in different contexts and highlight the inequality caused by teachers in bilingual settings where children are taught in a language in which they are not fluent. They reveal how teachers make explicit discrimination based on the gender or socioeconomic background of the students within the classroom. This, in return, leads children to lose their faith in their capacity to learn, and it marginalizes them. From the limited research on this topic in the Turkish context, some scholars (Akhun et al., 2000; Tan, 2000; Sayilan, 2008) stress that the arrangement of learning processes and education using a gender-based model and the gendered manner of teachers discourages girls' participation in learning and creates a lack of confidence. In particular, the research of Cin (2014) draws attention to teachers' experiences in classrooms in different region of Turkey at the macro level and argues that teachers follow pedagogical approaches that underestimate girls' performance, particularly in maths or science classes, or that they discriminate by not paying attention to children of a certain ethnicity or from a socioeconomically lower class. Some researchers (Kaya, 2009; Kirdar, 2009) highlight the disadvantages and inequality that Kurdish speaking children experience in Turkish-instructed schools. These studies provide us with a glimpse of classroom dynamics, power relations, and student-student or teacher-student interaction, yet none specifically focus on inequalities at the classroom level. There appears to be little concern for classroom research and inequalities stemming from teacher behaviour, rote teaching methods, or power asymmetries in teacher-student interaction. Therefore, in this paper, we theorize a capabilities approach based on a social justice perspective to examine classroom

inequalities in maths classes. Building on these studies, we consider how a capability approach can be applied to maths classes.

1.2. Equity and Social Justice in Maths Classes

The equity and social justice research on maths classes overwhelmingly focuses on the idea of teaching mathematics for social justice to understand, analyse and address issues of social inequalities (Gutstein, 2006; Leonard and Morre, 2014). Teaching for justice and equity is associated with wider aspects of education such as equity pedagogy (Banks, et al, 2005), culturally responsive pedagogy (Gay, 2000) or critical pedagogy (Freire, 1991; Kincheloe & Weil, 2004). Such pedagogies focus on providing equal opportunities for students to better understand the conditions of inequality in their environment and help them to develop agency. Although we acknowledge the importance of such studies in the literature, we are more interested in the learning environment in maths classes and how teachers address the broad and varied range of student needs in the classroom. In other words, our focus is on teachers' perception of equality and justice in the classroom and whether the teacher can provide everyone with the equal opportunity to learn mathematics. There are numerous conditions that a teacher should take into consideration when considering a pedagogical and social justice goal, such as diversity. In a classroom context, this means addressing the different needs of the student and creating a learning environment in which all students have access to opportunities to learn and to resources and where they can express themselves and succeed (Herzig & Knott, 2005) rather than the teacher privileging one group of students. In this case, what is meant by equity is equal access to teachers, resources, and learning opportunities while taking into consideration that students may need different resources to be successful (Gutierrez, 2002). Therefore, equality focuses on the equal distribution of resources, but equity is about accommodating diversity (Unterhalter, 2009). To be more specific, in a maths class, equity means providing all students with the resources, high quality teaching and pedagogy they need (Boale, 2002) and providing the opportunity to question and change social practices through maths (Gutstein & Peterson, 2005).

Although there is not much research on classroom dynamics in maths classes, the limited literature on classroom justice argues that a classroom may have different levels of inequitable power dynamics such as girls having low self-esteem or boys dominating classroom space and gaining more attention from the teacher (Chory-Assad & Paulsel, 2004a, 2004b; Horan & Myers, 2009; Paulsel & Chory-Assad, 2005; Younger & Cobbett, 2014). The studies focus on the importance of how students and instructors perceive justice and argue that students display resistance, disappointment and aggression when they witness an instructor who does not display fair treatment. It is therefore important to explore whether teachers can identify the inequalities in the classroom and how they should handle these inequalities so that they can offer a better quality of teaching and improve students' learning experience.

Drawing from these content-rich but limited studies, we can argue that there is a gap around classroom inequalities in maths classes in the literature. Therefore, we aim to fill this void by taking a voice-centred approach, which recognizes human experiences and argues that these experiences are bounded up in larger relational dynamics (Frost, 2008), and focusing on teachers seeking answers to following questions:

(*i*) What inequalities do maths teachers experience in their classrooms and

(*ii*) How do teachers address such inequalities?

2. METHODS

2.1. Research Design

This study employs qualitative research. The research aims to explore the nature of classroom inequalities, the reasons beyond these inequalities such as how teachers react or perceive an inequality. It also aims to offer an in-depth analysis of the different and intersected inequalities experienced in the class. Therefore, to address such a complex issue, a case study design has been especially used and observations and interviews were conducted with teachers (Best & Kahn, 1993; Gay, Mills & Airasian, 2005; McMillan & Schumacher, 2006). A case study design enables more than one phenomenon to be further explored, investigated and explained (McMillan & Schumacher, 2006). One of the most important feature of case study is that it helps researchers find out the relations between the components of a case and to define the specific and unique aspect of a given case (Christensen, Johnson & Turner, 2011). In our study, the case was classroom inequalities.

2.2. Participants

Participants are selected via criterion sampling technique. Criterion Sampling is based on predetermined criteria of importance in selection of participants (Neuman, 2005). To select the participants, we conducted a pre-interview with 30 mathematics teachers and our main criterion was to identify teachers who were working in disadvantaged schools and who experienced classroom inequalities such as gender, disability and class. So, we conducted the research with 6 mathematics teachers teaching at the secondary level of primary education. All the teacher names provided in the text are pseudonyms. The teachers had between 5 and 12 years of teaching experience. Four of them were female whereas two of them were male. They all worked in a disadvantaged school so that they could provide us with a comprehensive and detailed description of the nature of inequalities. Disadvantaged schools in this research refer to suburban schools with limited resources and insufficient infrastructure facilities which also have students from socio-economically low backgrounds. We did not set out to find a representative sample of teachers but wanted to establish a sample that would enable us to theoretically engage with inequalities.

2.3. Data Collection Tools and Procedure

The study began with classroom observations. We monitored teachers' classrooms for one academic term so that we could better understand and make sense of the type of inequalities that teachers understand and mention in their classrooms. Classroom observation was used as a secondary source of data for this research, but it was significant, as it helped us to connect with the realities that teachers experience in a classroom environment, to develop a specific list of inequalities experienced in each teacher's classroom, and thus to prepare a more efficient interview protocol to unearth teachers' genuine perceptions of inequalities. The observations focused on classroom interactions, which include teacher-student or student-student interactions, strategies for coping with inequalities and conversion factors for capabilities (such as training, teacher behaviours, skills, power relations). The primary source of data of this research is interviews, which were conducted during the observations.

We conducted semi-structured interviews with 6 teachers. We held between 4 to 6 interviews with each teacher. Interviews started after classroom observations. The first interviews focused on teachers' perception and conceptualization of inequality and social justice whereas the other interviews aimed to unearth the conditions of inequalities taking place in classrooms. The interview questions were formulated to elaborate on the specific inequalities experienced in each teacher's classroom and to explore how they interpreted or understood each specific inequality. For instance,

some of the questions are: "What are the inequalities you experience in your classes?", "How do you address problems of inequality?", "How do you conceptualise inequality?" and "How do you provide academic support and equal opportunity for learning for students with inequalities?" The observations and the interviews continued until we received no longer new data.

The interviews and observations were first transcribed. Then we used thematic analysis as it is theoretically flexible to analyses qualitative data (Boyatzis, 1998). This method identifies analyses and reports themes in detail within data. We generated 9 codes of: voice, undemocratic, classroom environment, pedagogies and teaching methods, diversity/gender, learning materials, unequal opportunity of access to time and teachers, confidence, knowledge, economic difficulty. Then, we went through our data to map thematically overlapping conditions of inequality linked with capabilities framework, which helped us to develop a more detailed analysis of data driven by theoretical and analytic interest. Finally, four themes were formulated out of nine codes: access to learning materials, access to teacher, democratic classroom environment and voice; and appropriate teaching and pedagogy. These themes can be considered as opportunities a student should have for equal and meaningful learning experience.

2.4. Validity and Reliability

We have followed following steps for the internal validity of the research. First, we transcribed the observations and interviews. Then the transcriptions were sent to the participants for verification. After participants checked and verified the data, thematic analysis was conducted in accordance with the theoretical framework. For the external validity, we made the research process transparent and presented the research design, process, profile of participants, data collection tools and data analysis process in detail. Also, some of the themes arising from the narratives formed the basis for a review of literature and it was possible to compare findings with other research, which have also focused on classroom inequalities. In terms of reliability, we provided extracts that could capture the essence of the themes in order to demonstrate a clear account of what is happening in classroom.

3. FINDINGS

3.1. Identifying capabilities for classroom justice

It is helpful to identify the capabilities for classroom justice because we believe that justice analysis should be based on moral pedagogical principles for the equal opportunity of learning. Therefore, we draw from observations of teachers for one academic term and their voices from interviews and offer a proposal for how classroom justice can be established at schools. In this way, we try to elucidate issues of justice and equality in education with a specific focus on maths classes. Although we discussed the findings in conclusion section, some of the discussion in relation to literature and findings was also incorporated in this section to contextualize the results and make them more meaningful.

3.2. Capability to access (appropriate) learning materials

Studies on educational inequality in Turkey (Bakış et. al., 2009; Alat & Alat, 2011) show that the socioeconomic background of students and their families plays a key role in accessing and continuing education and being successful. Free education or financial support does not necessarily decrease direct costs for students and their families (Alat & Alat, 2011). This is also confirmed by the teachers in our research, who argued that they could not ask for additional learning materials other than those distributed by the Ministry of National Education (MoNE) because low-income families may not be able to afford to buy them, which would create a condition of learning

inequality. This was reflected by the valuable but bitter experience of one teacher, Kerem, when he was asked for an additional material from a class:

> *"The math book provided by the MoNE is not the best book, and I as a teacher constantly feel that I need an additional course book to better elaborate on topics. Yet as teachers, we often forget that students come from different economic backgrounds and not every student can afford to buy it. When I asked students to buy additional books in the past, a few students could not do so. They were too shy to say that they could not afford the books. I witnessed their resentment and felt bad about it"* (Kerem)

Teachers also further expressed the challenges they experienced with strategies they have initiated to address these inequalities. For instance, two teachers, Pinar and Selin, mentioned that they did not have necessary resources such as a photocopy machine or toner to copy the additional materials. Working at socioeconomically disadvantaged schools, they also stressed the lack of smart boards, computers and other technological devices:

> *"In my previous school, parents were well off, and we had all the concrete materials including computers and online maths learning programmes, which were quite important for students' learning. However, now I work in a disadvantaged school where, let alone asking students to buy additional course books, I cannot even photocopy worksheets for students because the school's resources are very limited. In rich schools, all of these are provided by parents if the school does not have enough financial resources."* (Pinar)

All of the teachers confirmed Kerem and Pinar's experience in their interviews and argued that the feelings of resentment and embarrassment students experienced when unable to buy materials creates anxiety, lowers achievement, causes students to fall behind their friends and discourages them from learning. Likewise, a lack of materials also places students in a disadvantaged position nationwide compared to those who can access a wide range in other schools. It appears that teachers cannot fully address such inequality.

However, they also stressed that although the free distribution of the same textbooks to all students and schools in Turkey could be seen as an indication of equality, it instead forms a condition of inequality, as these books do not address the learning needs of different students. Therefore, no learning resources are being provided for students of different types. In addition, the books provided are not flexible and also do not address the cultural context of the region:

> *"I have worked in different parts of Turkey and the biggest challenge is that the maths textbook used in Istanbul and in the rural parts of Eastern Anatolia is the same. I think this is wrong. Books with more warm-up activities should be provided in rural and Eastern areas because maths achievement is low in these places and there is an established prejudice among students against maths, that they will not succeed. Examples given in the book should be adopted according to the cultural context. Providing pizza as an example when teaching fractions is not a good strategy for students in such areas because they may not know what pizza is, and they feel alienated from the topic from the beginning."* (Oya)

All of the teachers agreed with Oya's argument that providing the same learning material is not equality if the quality and content of the material is not appropriate for the students. It is hard for students to learn when they cannot personalize the subject or link the maths with their daily lives. Although teachers try to manage this situation through minor modifications, such as in Oya's pizza example, it became obvious in the interviews that a majority of teachers have difficulty in establishing this link with students' lives as they are not familiar with the regional cultural context that they work in. Our classroom observations also supported teachers' arguments; some students were not able to buy additional learning materials assigned by teachers due to economic difficulties

and this led to chaos in classroom. Some teachers used concrete learning materials such as geo-boards, pattern blocks, multi-based arithmetic blocks and however, they did not share them with students in case these materials get lost or damaged. As such, this creates teacher-centred learning environment and excludes authentic learning materials. This ignorant and culturally insensitive attitude towards students' learning can significantly impact their maths learning and thinking (Presmeg, 2007).

3.3. Capability to access the teacher

Another capability uncovered by this study was related to the time and attention each teacher shows to a student. It is well argued in the social justice literature in education that providing equal opportunities is not enough to generate access to learning or education but that environmental or contextual conversion factors that could impede the use of equal opportunity should also be taken into consideration (Unterhalter, 2007). In the first interviews conducted with teachers, they all argued that they interacted with every student in the class but had more mathematical conversation with those who were successful in maths. However, our classroom observations revealed that this was not the case; in fact, teachers did not interact with some students at all and paid more attention to the successful students. As for introverted and least successful students, the interactions with teachers were at a minimum level. Therefore, we asked the teachers to pay attention to their classroom environment and to monitor with whom they mostly interacted. Through this exercise, the teachers realized that they completely ignored most of the students and focused on a few successful students who could connect more easily with mathematical thinking.

In addition to the situation described above, Canan argues that allocating equal time and effort for each student does not mean that the teacher is doing justice; what matters is that teachers should allocate the necessary amount of attention for every individual's needs:

> *"As a teacher, I always thought if I allocate same amount of time and effort for each student, I would do justice. But it is not so; every individual has different learning paces, processes and needs different methods of learning. So, one student may understand a mathematics topic in 2 hours by solving 3 examples, but the other may learn in 5 days and may need more examples to grasp it. However, insufficient classroom time and my inadequate pedagogical knowledge cause me to plan the course according to the needs of successful students. Maybe this is the easiest thing to do." (Canan)*

The other five teachers agreed and also stated they were doing an injustice and violating the equal opportunity of learning for other students by taking for granted that the topic was learnt once they saw that a few students were able to solve the problem:

> *"I think the biggest mistake we maths teachers make is that we often forget how students' learning needs differ. I used to proceed with another topic once I saw that a few students sitting in the front seats could do the maths. What about the ones silenced in the back rows? The biggest injustice is done to them, not to the ones who can do maths." (Fevziye)*

As depicted in the teachers' narratives and discussions, the different learning needs of students are often ignored for the sake of providing a higher level of maths to those who succeed or benefit effectively from the teachers' pedagogy or style. This inequality was not recognized until the teachers focused on and monitored their communication and then reflected upon their observations. However, the teachers argue that this inequality often results from overcrowded classes, which do not give teachers the opportunity to pay attention to each student.

3.4. Capability to have a democratic classroom environment where everyone has an equal opportunity to voice their needs and ideas

The multiple inequalities experienced by disadvantaged students outside the school can also be seen in classrooms. The social justice studies in education argue that students who are marginalized and disadvantaged in society may often experience ignorance and discrimination in the classroom. The analysis drawn from qualitative research in this field shows that the inequalities that marginalized groups face in schooling often interact with inequalities relating to socioeconomic conditions, regional diversity, ethnic minority status and multiple factors of discrimination (Untherhalter, 2009) as well as with other identity structures such as age, class, and ethnicity. For instance, Dejaeghere and Miske's (2009) research on ethnic groups in Vietnam indicates that being an ethnic minority coupled with poverty creates structural barriers such as discrimination and teachers' lack of respect for ethnic identity and towards the use of students' native language. These barriers negatively influence the educational lives of girls, cause exclusion within and beyond school and lead girls to develop a perception of inferiority. In relation to this research, the teachers argued that they often underestimated students who were shy and perhaps felt unsuccessful and insecure due to their low achievement or poor socioeconomic background:

> *"What I have realized in my classes is that I have quite a few students who sit at the very back, and they hardly participate in class. It is my fault because I do not pay enough attention to increase their participation. Those students are the ones who are the least successful and thereby have developed an insecurity about math classes, and two of them come from very poor families where they have no one to help them in maths class. A few of them are girls. I feel sorry that I never gave an opportunity to those kids to participate in class and to express themselves." (Kerem)*

It can be very clearly read from Kerem's quote that gender and poverty become the determinant of who can dominate the classroom discussion and environment to express their ideas. This further implies that some students may need more attention or more gender friendly classrooms to reach the same level of capability to participate in learning. Kerem's ideas echoed with the other teachers and all five other teachers also described similar cases in their classes. Among these cases, one significant factor is disability. Not all but three teachers, Fevziye, Selcen and Pinar, had mentally or physically disabled students in their classroom. They felt unsure and insufficient in terms of how to approach these students and felt that the school and its psychological counselling department did not provide them with the required guidance. This made it difficult for them to develop a strategy to address these students. They expressed that they had limited or no mathematical conversation with the mentally disabled students and that they had more daily conservation with these students. To the contrary, they allocated extra-class hours for physically disabled students. Because these students are very reserved and introverted, they do not participate in the classroom environment. A discussion on how to address this problem elicited the suggestion that the necessary reinforcement and encouragement could be provided to students so that they could voice their demands. Teachers underlined the importance of providing disadvantaged students, such as the disabled, those who are unsuccessful and students from a lower socioeconomic background, with the necessary reinforcement and encouragement.

> *"I see in my classes that even if some students want to participate in class and ask questions, they feel reserved because they fear being mocked by their high-achieving friends in case of a mistake, or some students simply do not have the courage to raise their hands and talk. I encourage these students to talk and praise them even if they give incorrect and irrelevant answers. I try to create a friendly environment for everyone." (Selcen)*

Selcen's quotation above indeed raised another significant issue, psychological and verbal

violence, which could be in the form of name-calling, humiliation, stigmatisation, or insult. In parallel with the literature, teachers argued that such violence causes children to develop low self-esteem or to achieve less (DeJaeghere & Lee, 2011; Warrington & Kiragu, 2012; Engin-Demir & Cobanoglu, 2012). In this study, we found that such psychological violence was not only peer but also teacher initiated. Teachers could be sarcastic or could ignore the humiliating comments in the classroom, while peers can mock lower achieving or less confident students:

> *"Needless to say, I am against any sort of violence towards students. However my sarcastic comments or increasing my voice in the classroom could be easily defined as a psychological violence. Sometimes, I unconsciously insult students saying "stupid" or "dummy", though I don't really mean that. My aim is to control the class and to discipline them. It is obvious that it affects the student." (Kerem)*
> *"From time to time, high achieving students make disturbing or humiliating comments in class about their peers. I used to ignore these comments or sometimes warn them, but it appears that it is a sort of verbal assault that could severely lower students' self-esteem or discourage them from participating in class." (Selim)*

The teachers' quotations clearly show that they sometimes fail to provide a friendly environment for learning. In the interviews, they argued that they used sarcasm or mocking to maintain authority in the class or to discipline students by suppressing their self-esteem, although they were aware that this could potentially discourage students from joining in classroom activities and learning. They also had little awareness that the types of comments that they and other students had been making in the class were a type of inequality and could possibly prevent students from participating in the learning process. Further discussions with the teachers also indicated that it is important that all students should feel that they belong to the classroom and that all students should be treated with dignity to create a learning environment where everyone felt equal. Being respected, receiving teachers' and peers' support, care and respect and an environment without humiliation can help children to build confidence and participate in learning in more meaningful ways.

Lastly, we observed that it is not the mathematical arguments but who makes these arguments that are more important. When a low achieving or a silent student makes a correct argument, it can be underestimated because it does not come from a top student. For instance, Kerem stated that if a high achieving student could not solve a problem, then the rest of the class would not even bother trying to solve it because they would regard themselves as being less smart and less capable.

In summary, as depicted above, during classroom discussions or activities, mistakes or a low level of understanding from students may sometimes not be tolerated, and these students could face humiliating comments or giggling. The teachers emphasized that supporting student involvement or a stimulating classroom environment is very important to convince students that they can succeed. The capability of voice, indeed, is highly significant as other capabilities are built on it. Voice can be exercised in the classroom through an interactive curriculum and a student-friendly, democratic and critical pedagogy that challenges practices of silence (Walker, 2006).

3.5. Capability to access appropriate teaching and pedagogy for different learning styles and needs

Each student has different pedagogical and learning needs. Some may need more visuals, whereas others may need more concrete real life examples with hands-on activities. It is vital to design a course appropriately and to address as many different learning strategies in class as possible so as not to disadvantage any students. However, as mentioned by the teachers in our

study, most maths classes are based on an oral explanation by the teacher accompanied by solving a few questions on the classroom board. Such a simple technique addresses the learning needs of a few students only and ignores those who have low esteem in maths or who may have a lower level of understanding.

In addition to addressing different learner needs, it is equally important to be able to teach the content at a level that everyone can understand. The most common problem experienced in maths classes is the difficulty on balancing the level. There is a diversity among learners, and not every student has the same level of learning and understanding. So, teachers stated that they often felt confused about what they should use as a norm when teaching. The dilemma teachers experience is that they feel that they are doing an injustice to bright students when they decrease the level of maths teaching, but at the same time, they also feel that they are being unfair to those who are struggling in maths when they keep the level higher. The problem lies in how to balance the level of content teaching:

> *"I think the greatest equality lies in the dilemma of deciding according to for whom we should do the teaching. There are few very bright students in maths classes. When I teach up to their mathematical knowledge level, the rest of the classroom cannot be involved. For example, students need to know integers before they can proceed with algebraic equations, but most students do not have sufficient prior knowledge of integers. In such a case, I prefer to work on equations. This makes me feel like I am acting equal to everyone, as I am teaching the same topic to everyone." (Pinar)*
>
> *"Instead of following the mathematical syllabus administered by MoNE, I prefer to work on topics in which students lack sufficient understanding. It makes me feel that I am wasting the resources of those bright students when I focus on prerequisite courses. It is hard to keep the balance when you have a big gap in maths classes." (Fevziye)*

Teachers argue that this gap is further reflected in homework, as bright students may find it too easy, whereas the ones who are not doing very well can find it quite challenging. Therefore, distributing homework according to the knowledge and ability level of students was one of the suggestions proposed by Canan:

> *"I quite hesitate about what sort of homework I should assign to students. For some, the homework can be very difficult and for some, it is a piece of cake. So I try to assign a different sort of or more challenging exercises for very good students. It at least relieves me a bit that the skills of those students are not being wasted." (Canan)*

Our observations showed that teachers prioritize covering all the topics in the curriculum regardless of whether students have fully understood the subjects. Teachers also lack pedagogical and content knowledge and therefore they adopt rote-learning technique and do not contextualize the learning. Such an approach excludes the least successful students and keeps favouring the successful students. It can be argued that when identifying the learning needs of students and distributing activities and homework, teachers find it rather important not to discourage the less visible students in class as well as to challenge the more successful students. Such a balance can make learning more meaningful for students. However, adapting such particular forms of classroom pedagogy highly depends on the teacher's training and the culture in terms of concern with learners' differences (Walker & Unterhalter, 2007). Teachers need to hear every student's voice to understand how they do maths, to have an idea about their misconceptions and to provide them with equal learning opportunities. Unfortunately, as stated above, teachers are more likely to engage with high achieving students and can be ignorant about the needs of the rest. This is a major challenge to learning different methods and professional development.

In this paper, we have used the capabilities approach to investigate the conditions that lead to inequality in students' freedoms and opportunities within the mathematics classroom. Drawing from interviews with six teachers and classroom observations, we have highlighted the lack of

capabilities in the classroom experienced by students through the voices of teachers because it is the teachers who must take the initiative to provide students with these capabilities. As we have argued before, although this lack of opportunities can also be seen in other classes and is not particular to the mathematics classroom, it could be argued that it is more visible in maths class due to the inequality involved in learning mathematics and in maths achievement. Although this list may not cover all of the conditions of inequality in Turkey and cannot be generalized, it still provides us with an analytical generalization and a glimpse of what could happen in an average classroom in Turkey. Thus, this paper proposes a social justice framework for performing classroom research from a capabilities-focused praxis that is context specific, and it maps out a new capabilities direction to examine classroom inequalities in Turkey. We discuss the further implications of these capabilities and what it says for teacher education in the conclusion.

4. DISCUSSION AND CONCLUSION

The capabilities approach employed in this paper aimed to uncover the conditions of inequality and to explore the conversion factors that stand in the way of students in maths classrooms by examining teaching practices and drawing from the in-depth individual interviews. We acknowledge that data drawn from 6 samples cannot be generalized and may be unrepresentative. However, they can at least inform us about the nature of the inequalities in mathematics classes, which has not been attempted by any other research in the Turkish context. These valued capabilities are important to guiding us in the design of policies and teacher training programmes.

The capability of equal access to learning materials, including books and technology is determined by economic class factor. As argued by Raudenbush et al. (2008) in their research of inequality of access to learning materials for mathematics learning, such inequality can be seen as the transfer of sharp home inequalities to learning outcomes and to schools. Many researchers on educational inequality (Wang, 2000; DeJaeghere and Lee, 2011; Cin, 2014) tease out that lack of such materials, quality teachers or well-equipped classrooms with instructional materials stands for distinction of urban and rural or developed or developing region. Similarly, further research on maths learning (Oakes, Joseph, & Muir, 2004; Secada, 1992; Tate, 1997) indicates that inadequate opportunities, resources, teachers and curricula to learn mathematics is not unusual and lack of access to such resources, teachers and opportunities prevent students to develop mathematical capacity to reason and communicate at a higher level (Gutstein, 2006). In addition, research of Rubagiza et al. (2011) also stressed that how equal distribution of classroom resources such as teacher time and attention was important for recognition diverse groups of learners but at the same time they argued that it did not necessarily create an optimal participation of girls. In the same vein, our research echoed this finding that fair distribution of teaching time should be accompanied by democratic classroom environment that foster students to express their ideas if participation diverse groups want to be increased.

As argued here, some authors (Duru-Bellat, 2007) also revealed that providing identical program content, classroom conditions or being equal (Unterhalter, 2009) cannot be taken as the mark of equality. This is because classroom level, teaching, pedagogical differences and social background of pupils vary to a large extent and play a role in academic attainment, so there should be a room for addressing diversity, which makes equity genuine. The research of Duru-Bellat (2007) also argues that the goals and expectations set by teachers should also be adjusted, and more realist and modest goals, learning objectives and pedagogical adjustment should be set for different learners.

Lastly, the argument that classroom reflects microcosm of larger society in which hierarchy

and inequalities are reproduced is also echoed by Majumdar and Mooij (2011) whose research highlighted that teachers' lack of confidence in or ignorance of slow learners or less successful students make them lose their interest and confidence, and student favoritism of teachers clearly mark the already existing inequality between successful students and the least successful students or among students of different gender and class.

As depicted in this paper, the multiple dimensions of inequalities are related to the unequal distribution of resources, a lack of recognition of student needs, identities, and background and a lack of representation of marginalized students (the disabled, girls, low-achieving students and students of lower socio-economic background) in the classroom or in the teaching and learning activities. We believe that these factors were better identified through classroom observations and in-depth interviews with teachers who had been allowed to reflect upon their teaching. We thought that focusing on teachers could be more helpful in teasing out the inequality issues that students may not be able to address, and it could provide further elaboration on a gap in opportunities that students may not be able to identify, such as gendered interactions or geographical sensitivity. In addition, focusing on teachers was also useful for exploring the extent to which the nature of inequalities was teacher or pedagogically driven. We acknowledge that the inequalities one may experience in the classroom cannot be reduced to teacher behaviours and pedagogical undertakings, since the curriculum, physical conditions of school, infrastructure, textbooks or educational policies can reinforce and reproduce the social inequalities in society and perpetuate them in the classroom. However, this study shows us that a lack of opportunities or freedoms in the classroom can be prevented by teachers. Quality input for teacher/head teacher education and training to act on issues of injustice and inequality can be important, so that the necessary capability inputs are provided to enable students to enjoy a non-discriminatory education (Tikly & Barrett, 2011). In this sense, equality-aware teacher training for teachers or a professional development programme that could address such delicate issues could be beneficial for raising awareness at schools and in classrooms and for creating more equality-sensitive teachers. Therefore, a great responsibility falls on higher education institutions and school boards, who need to offer better quality teacher training and in-service training programmes.

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Uzun Özet

Bu çalışmanın amacı sosyal adalete dayalı yapılabilirlik yaklaşımı çerçevesinde sınıf içi eşitsizlik durumlarını incelemektir. Çalışmanın temel odağını PISA ve TIMMS gibi uluslararası sınavlardaki öğrenci başarıları arasında büyük uçurumların olduğu matematik dersleri oluşturmaktadır (Yücel ve Karadağ, 2016). Bu bağlamda çalışma kapsamında yapılabilirlik yaklaşımı kullanılarak matematik derslerindeki sınıf içi eşitsizlik durumları ve durumların sonuçları ortaya çıkarılmaya çalışılmıştır. Bu eşitsizliklere odaklanılmasındaki temel amaç sınıf içi eşitsizliklerin öğretim kalitesi üzerindeki etkisini ortaya koyarak öğrencilerin için oluşturulacak öğrenme fırsatlarının arttırılmasına katkı sağlamaktır.

Çalışma kapsamında sınıf içi eşitsizlikleri belirlerken Amartya Sen (1993) tarafından geliştirilmiş olan yapabilirlik yaklaşımını kullanılmıştır. Bu yaklaşım, insan onuru üzerine kurulu normatif bir anlayışa sahiptir ve sosyal düzenlemelerin, iyi oluş halinin ve toplumdaki sosyal değişime hitap edecek politikaların tasarlanmasının değerlendirilmesi ve kavramsallaştırılması için kullanılır. Bu yaklaşım eğitim çalışmalarında ise eğitim eşitsizliklerini değerlendirmek ve öğrencilerin eğitim faaliyetlerine ne ölçüde katılabilmekte olduklarını sorgulamak üzere uyarlanmıştır (Unterhalter, 2007). Bu çalışma bağlamında ise, söz konusu yaklaşım eğitimde özellikle sosyal adalet olgusuna incelemek ve sınıf içindeki eşitsizliklerin kötü (adaletsiz) kaynak dağılımıyla (öğretmenin öğrencilere harcadığı süre gibi) nasıl üretildiğini incelemektedir. Yaklaşım sadece eşitsizliğin sonuçlarına odaklamamakta olup sosyal adaleti güçlendirmek için okulların ve eğitimin nasıl dönüştürücü bir alan yarattığı ya da yaratabileceği üzerine de vurgu yapmaktadır.

Bu çalışma nitel araştırma yaklaşımları kullanılarak tasarlanmıştır. Creswell (1998) nitel araştırmayı, sosyal yaşamı ve insanla ilgili problemleri kendine özgü metotlarla sorgulayarak, anlamlandırma süreci olarak ifade etmektedir. Yıldırım ve Şimşek (2005) ise nitel araştırmayı; gözlem, görüşme ve doküman analizi gibi veri toplama yöntemlerinin kullanıldığı, algıların ve olayların doğal ortamda gerçekçi ve bütüncül bir biçimde ortaya konmasında, izlenen yol olarak tanımlamaktadırlar. Çalışmada sınıf içi eşitsizliklerin doğasını, öğretmenlerin bu eşitsizlikleri nasıl algıladıklarını ve bu eşitsizliklerle nasıl başa çıktıkları araştırılmıştır. Bu nedenle sınıfta birbiri içine geçmiş ve kesişen eşitsizliklerin derinlemesine analizini yapılmıştır. Çalışma durum çalışması şeklinde kurgulanmış ve öğretmenlerle yapılan görüşmeler ve sınıf içi gözlemlerle gerçekleştirilmiştir. Merriam'a (1998) göre durum çalışması, ilgilenilen araştırma konusu hakkında derinlemesine bilgi elde etmeyi ve olayı her yönüyle anlamayı amaçlayan bir araştırma tasarımıdır. Bu tür çalışmalarda araştırmacı veri toplamada, analiz etmede ve bu verilerden sonuç çıkarmada

birinci derecede kaynak teşkil etmektedir. Çalışma 5 ile 12 yıllık bir deneyime sahip olan ve sınıfında farklı eşitsizlik durumlarının (sosyo ekonomik statü, engellilik durumu gibi) yaşandığını belirten altı ortaokul matematik öğretmeni ile gerçekleştirilmiştir. Çalışmada verilerin analizde betimsel analiz kullanılmıştır. Betimsel analiz; nitel çözümlemelerdeki verilerin özgün biçimlerine sadık kalınarak, kişilerin söylediklerinden, yazdıklarından ve dokümanların içeriklerinden doğrudan alıntılar yaparak, betimsel bir yaklaşımla verilerin sunumudur. Ayrıca betimsel analiz, nitel çözümlemelerde yer alan kelimelere, ifadelere, kullanılan dile, diyalogların yapısına ve özelliklerine, kullanılan sembolik anlatımlara ve benzetmelere dayanarak tanımlayıcı bir analiz yapılması olarak da tanımlanabilir (Kümbetoğlu, 2005).

Çalışmada öğretmen-öğrenci ve öğrenci-öğrenci etkileşimleri incelenerek öğrencilerin öğrenme süreçlerini etkileyen eşitsizlikler, öğretmenlerin bu eşitsizliklere ilişkin algıları ve bu eşitsizliklerle başa çıkma yöntemleri analiz edilmiştir. Ayrıca öğrencilerin derse katılımı, akademik başarıları, öğretim materyallerine ulaşımları, sınıf yönetimi ve kullanılan öğretim teknikleri gibi öğrenme süreçleriyle yakından ilişkili durumlar yapılabilirlik yaklaşımı bağlamında incelenmiştir. Yapılan analiz sonucunda elde edilen bulgular; sınıf içi eşitsizlik durumları öğrencilerin öğrenme materyallerine ve öğretmene ulaşımı; demokratik bir kültürüne sahip olma ve ihtiyaçlarına uygun öğretim yöntemlerine ulaşım olarak dört tema altında tartışılmıştır. Öğrencilerin öğrenme materyallerine ulaşımı teması altında öğrencilerin teknolojiye ve ek kaynaklara ulaşmada yaşadıkları sıkıntılar, bu sıkıntıların ders içinde ders içinde neden olduğu sorunlar ve bu durumun öğretmenler tarafından nasıl üstesinden gelinmeye çalışıldığını sunulmuştur. İkinci tema olan öğretmene ulaşım temasında ise öğretmenlerin sınıf içinde öğrencilerle günlük hayat ve matematiksel paylaşımları ve ders içinde öğretmenin zamanı kimlere daha fazla ayırdığına ilişkin bulgulara yer verilmiştir. Üçüncü tema olan demokratik bir kültürüne sahip olma temasında bütün öğrencilerin derslere katılım düzeyleri, sınıf içi etiketlemeler, bütün öğrenciler için öğrenme fırsatları oluşturup oluşturulamadığını, öğrencilerin birbirlerine saygı ve hoş görü gösterip göstermediği gibi durumlar ve bu durumlar sonucunda oluşan eşitsizlik durumlarına yer verilmiştir. Dördüncü tema olan öğrencilerin ihtiyaçlarına uygun öğretim yöntemlerine ulaşım temasında ise öğretmenlerin farklı öğrencilerin farklı öğretimsel ihtiyaçlarının olduğunun farkında olma düzeyleri ve sınıflardaki öğretimsel çeşitliliğe ilişkin bulgular sunulmuştur. Çalışmanın sonucunda, sınıf içinde öğretmen tarafından kaynakların adil olarak dağıtılmadığı –öğretmenlerin geleneksel yöntemlerle matematiği daha hızlı anladığını düşündüğü öğrencilerle daha çok etkileşim kurduğunu ve onların matematiksel gelişimlerine daha çok önem verdikleri- görülmüştür. Bununla birlikte sınıf içinde öğretim etkinlikleri hazırlanırken ve uygulanırken öğrencilerin kültürlerinin, ihtiyaçlarının, engellilik ya da sosyo-ekonomik durumlarının dikkate alınmadığı gibi bulgulara erişilmiştir. Ayrıca öğretmenlerin dezavantajlı ve matematiği geleneksel yöntemlerle anlamakta zorlanan öğrencilere yönelik öğrenme fırsatları oluşturmak yerine, onları görmezden gelip başarılı öğrencilere daha çok odaklanarak mevcut eşitsizlik durumlarının daha da derinleşmesine neden oldukları görülmüştür. Çalışmanın sonucunda öğretmenlerin eşitsizlik durumlarının farkında olmadıkları ya da nasıl başa çıkacaklarının bilmedikleri için bu durumları görmezden gelmeyi tercih etkileri gözlenmiştir. Bu nedenle öğretmenlerin eşitsizlik durumlarına ilişkin farkındalıklarını arttırmaya yönelik mesleki gelişim çalışmaları yapılmalıdır.