

TOPIC STUDY GROUP NO. 33
EQUITY IN MATHEMATICS EDUCATION (INCLUDING GENDER)

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The Topic Study Group 33 at ICME-13 (TSG33) provided a venue for discussion by researchers and practitioners from different countries who are passionate about issues of equity and are working in their particular settings toward achieving the goal of *mathematics for all*. Certainly variations exist among countries in the terms used (e.g. equity, diversity, inclusivity, social justice) and the targeted groups (eg. based on race, indigeneity, socioeconomic background, physical and cognitive disabilities). Our understanding of the complexity of issues related to opportunity to learn, participation in, and achievement in, mathematics have also changed as new theoretical models have informed our collective work.

The aims of TSG33 sessions included, but were not limited to the following:

- Problematise the equity agenda itself, as increasing and sometimes competing demands for social justice from different groups require attention;
- Examine new theoretical frameworks that help us understand and study equity;
- Consider the prevalence of (in)equity around the world;
- Analyse intervention programs around the world with an eye to identifying characteristics of successful interventions that may transfer to different cultural settings; and,
- Query equity in participation in mathematics education research and international dialogue, with a focus on who is excluded from participation.

We commence, by making two observations about the equity agenda in research and policy around the world. First, we note that in the past decades, equity has become mainstream in mathematics education in the sense that it is an integral part of curriculum documents and policy in many countries, many research and professional conferences, and professional publications in the field. However, in the ever increasing dominance of educational testing as a springboard for education policy and evaluation that often equates educational outcomes with the results on standardized testing in many countries, Clarke (2014) observed that "equity has been colonised by, and subordinated to, discourses of quality in education, becoming, in a sense, another form of accountability, if one with a conscience" (p.594).

Second, and perhaps related, is that discussion of equity has been an integral part of other areas of theory and the implied curriculum approaches in the discipline as articulated by critical mathematics education, ethnomathematics, culturally relevant mathematics education, political and social justice approaches, and, sociocultural and sociopolitical perspectives to mathematics education. It is worthwhile to note that some of these lines of research have been reflected in national and international policy formulations and wide adoption in practice more than others.

Here we identify two challenges to understanding equity as access, participation and outcomes that were raised by a variety of authors in more recent literature - from post-structural and from sociopolitical perspectives respectively. On one hand, recent literature in equity and mathematics education provided alternative understanding of the concept of identity as seems to be assumed in traditional approaches of participation and achievement. In the pioneering understanding of equity, identity and group belonging were taken as fixed and given. However, from a postmodern perspective(s) identity, of students and teachers, is seen as "multiple, fluid, or contradictory" (Gutiérrez & Dixon-Román, 2011, p.21). The authors argue that "while documenting the inequities that marginalized students experience daily in mathematics education could be seen as the first step towards addressing hegemony, most research stops there" (p. 22). However, as Gill and Tanter (2014) noted "such developments were harder to capture in measurable terms and hence less likely to be written into policy" (p. 281).

On the other hand, some authors writing from sociopolitical perspectives have raised questions about the im/possibility of understanding and remedying equity within an intrinsically unequal society. Martin (2015) argued that the equity principles promoted by the high status policy statement reflects white rationality and promotes the participation in a system that has long oppressed African American and Latin@s students. By its silence on critical mathematics that aims at empowerment of marginalized students and their societies, it promotes an educational system that is more colonizing rather than liberating. Although using different social theories of oppression, similar concern is expressed by Pais and Valero (2011) who point out questions that often remain unraised with regards to equity such as: "Why is there inequity? Why is there a gap at all? That is, why does school (mathematics) systematically exclude/include people in/from the network of social positionings? ... Why does school perform the selective role that inevitably creates inequity?"(p.44). The authors go on to add "[a]s far as society remains organized under capitalist tenets, there will always be exclusion because exclusion is not a malfunction of capitalism, but the very same condition that keeps it alive" (p.44).

THE PROGRAMME

Invited Papers:

Renato Marcone (Brazil): "I Don't Wanna Teach This Kind of Student": Silence in Mathematics Education and Deficiencialism

Danny Martin (USA): From Critical to Radical Agendas in Mathematics Education

Margaret Walshaw (New Zealand): Recent Developments on Gender and Mathematics Education

Last names of the authors in the order as on the paper

Paper presentations:

Maria Alva Aberin, Ma. Theresa Fernando, Flordeliza Francisco, Angela Fatima Guzon and Catherine Vistro-Yu (Philippines): After-School Mathematics Program

Bill Atweh (Philippines) & Dalene Swanson (Scotland): Alternative Understandings Of Equity And Their Relationship To Ethics

Arindam Bose, Renato Marcone and Varun Kumar (Brazil): Non-typical Learning Sites: A Platform where Foreground Interplays with Background

Grant Adam Fraser (USA): An Intervention Program to Improve the Success Rate of Disadvantaged Students in Pre-Calculus Courses

Mellony Holm Graven & Nicky Roberts (South Africa): Focusing Attention on Promoting Learner Agency for Increased Quality and Equity in Mathematics Learning

Barbro Grevholm (Norway), Ragnhild Johanne Rensaa (Norway) & Joanne Rossi Becker (USA): Interventions for Equality – Their Creation, Life and Death. What Can We Learn from Them?

Jennifer Hall (Australia): Gender, Mathematics, And Mathematicians: Elementary Students' Views And Experiences

Gelsa Knijnik & Fernanda Wanderer (Brazil): Mathematics Education. Cultural Differences and Social Inequalities

Anina Mischau and Katja Eilerts (Germany): Without Gender Competent Math Teachers No Gender Equity In Math Education At School

Eva Norén & Lisa Björklund Boistrup (Sweden): Gender Stereotypes In Mathematics Textbooks

Anita Movik Simensen, Anne Berit Fuglestad and Pauline Vos (Sweden): Lower Achieving Students' Contributions in Small Groups – What if a Student Speaks with Two Voices?

Jayasree Subramanian (India): Gender of The School Mathematics Curriculum

Oral Communications:

Chang-Hua Chen and Chia-Hui Lin (Taiwan): Developing Differentiated Instruction To Close Learning Achievement Gap In Mathematics

Rosie Lopez Conde (Philippines): Pre-Service Teachers' Praxeology In Teaching Mathematics For Social Justice And Equity

Alice Larue Joy Cook: (USA) Implementation Of Social Justice Mathematics: Experiences & Perceptions Of Secondary Math Teachers

Guilherme Henrique Gomes da Silva (Brazil): Equity In The Higher Education: The Role Of Mathematics Education Faced With Affirmative Actions

Jennifer Marie Langer-Osuna and Jennifer Munson (USA): Supporting Elementary Teachers' Capacity To Foster Equitable And Productive Mathematics Classrooms

Lena Lindenskov, Steffen Overgaard, Pia Tonnesen & Peter Wenig (Denmark): Research On Early Intervention Programs In Denmark As A Means To Equity

Niamh O'Meara & Mark Prendergast (Ireland): An Investigation into the Inequity Surrounding Mathematics Instruction Time

Sally-Ann Robertson (South Africa): Teacher's Questioning Practices And Issues Of Learner Agency In Mathematics Classrooms

Posters:

Suzanne Beth Antink (USA): Contributing Replicable Factors in K-12 Female Student Mathematics Success

Susan Holloway (USA): Language Learning Adolescent Girl's Math Achievement: The "Ophelia Effect" In Colorado

Inge Koch, J. McIntosh, M. O'Connor (Australia): Choose Maths: Australian Approach Towards Increasing Participation Of Women

Ji-Eun Lee, J. Kim, W. Lim, Sang-Mee (USA): A Cross-National Study Of Conceptualizing Equitable Mathematics Classrooms

Luis Leyva (USA): Blending Academic And Social Support Through Apoyo And Consejos For Undergraduate Mathematics Success Among Latin@s

Daouda Sangare & Nangui Abrogoua (Ivory Coast): Gender Differences In Mathematics Performance In Sub-Saharan Francophone Colleges And Universities, Through The Pan

Neila de Toledo e Toledo (Brazil): Agricultural School, Its Mathematics Education And Social Inequalities

References

Clarke, M. (2014) The sublime objects of education policy: quality, equity and ideology. *Discourse: Studies in the Cultural Politics of Education*, 35(4), 584-598.

Gutiérrez, R. & Dixon-Román, E. (2011). Beyond gap gazing: How can thinking about education comprehensively help us (re)envision mathematics education. In B. Atweh, M. Graven, W. Secada & P. Valero (Eds.), *Mapping Equity and Quality in Mathematics Education*. (pp. 21 - 34). New York: Springer.

Martin, D. (2015). The Collective Black and Principles to Actions. *Journal of Urban Mathematics Education*. 8(1), 17-23

Pais, A., & Valero, P. (2011). Beyond disavowing the politics of equity and quality in mathematics education. In B. Atweh, M. Graven, W. Secada & P. Valero (Eds.), *Mapping Equity and Quality in Mathematics Education*. (pp. 35 - 48). New York: Springer.