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TSG

Topic Study  
Group 6

## TSG 6: Adult and lifelong mathematics education

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### Introduction

In adult and continuing education there seem to be two parallel and combined processes going on: *an institutionalizing process*, where schools or colleges for adults become subject to the sorts of regulation already experienced by schools for children and adolescents; and *a de-institutionalizing process* with a focus on adults' learning processes outside schools, some of which may be accredited as more or less equivalent to formal qualifications. Both tracks were represented in the work of TSG 6 where the key words were: globalisation, exclusion, equity, participation, technological and economic development.

The terminological basis of our work was this: *Adults* are engaged in a range of social practices, such as working (or seeking work), parenting and caring for other dependents, budgeting and organising consumption, voting, etc. The term *lifelong* indicates that education takes place in all stages and spheres of life. By *mathematics* we mean multiple activities and knowledge, including academic mathematics, vocational mathematics, ethnomathematics, folk mathematics and adult numeracy. Regarding *education* we adopted the terminology of UNESCO (2000) as a point of departure: *Informal education* means the lifelong process whereby adults are learning mathematics in everyday life (e.g., work, family, leisure, society). *Formal education* refers to the adult educational system from adult basic education and vocational training through further and higher education. *Non-formal education* is defined as any educational activity organized outside the established formal system that is intended to serve identifiable learning objectives.

Adult and lifelong mathematics education has multiple dimensions and the approaches represented in our discussions embraced, besides mathematics, a range of disciplines (psychology, sociology, politics, pedagogy, anthropology and androgogy), and a spectrum of concerns about inclusion – along lines of gender, class, ethnicity, age and language group. The contributors came from all six continents, and a range of themes and issues was addressed, including:

### Overviews of recent research and practice in adult numeracy and mathematics

After decades of neglect, adult numeracy and mathematics learning and teaching are coming to be recognised as worthy of serious research (Coben, 2003). Against this background, *Diana Coben* (UK) asked: What is specific about research in adult numeracy and mathematics learning and teaching? Are numeracy and mathematics distinct from each other? How do they relate to adult literacy? *Gail FitzSimons* (Australia) presented an analysis of "Adult and Lifelong Mathematics Education" utilising the theo-

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retical framework of Basil Bernstein which offers a coherent set of principles for linking the institutions of mathematics and lifelong education, and the emerging but contested construct of adult numeracy. At the macro or institutional level, she analysed the positioning of mathematics and numeracy education and research in relation to each other and to discourses of lifelong learning. These are set within the arenas of knowledge production and distribution, influenced by policy formation at national and international levels. At the meso level, within the field of recontextualising where knowledge transmission takes place, FitzSimons discussed curriculum formation and conditions of teachers' work. At the micro level, within the field of reproduction, where knowledge acquisition takes place, she discussed examples of recontextualising texts and their possible impact on learners' identities.

### Parents and community as intellectual resources

In her paper "Profaning the holiness of school mathematics", *Gelsa Knijnik* (Brazil) presented the theoretical basis, methodological procedures and results of a research project whose main goal was to discuss how cultural processes involving oral mathematics are produced and their curricular implications for the education of youths and adults in rural areas. This ethnographic study followed a group of 50 rural workers of the Brazilian Landless Movement, students in a teaching course belonging to this social movement, and illiterate youths and adults who participated in a workshop given by the course participants. *Marta Civil* (USA) presented two research projects on parents as adult learners of mathematics in a Latino/Hispanic working class community. The focus was on issues of content and learning environment: What mathematical content should we address when working with parents? What pedagogical approaches do they favour? The paper pays special attention to the voices of immigrant parents. Consistent with an emphasis on parents as intellectual resources, she addressed the need for adult education to build on all adults' experiences and knowledge. Under the title "Overcoming mathematics phobia in adults", *Vivek M. Wagh* (India) discussed some experiences of working with parents, guardians and community. His interaction had shown that that more than 90% of the parents of children facing difficulties in the learning of mathematics were found to have a phobia or repulsion towards mathematics.

### Issues of affect, beliefs, motivation, resistance and anxiety in adult learners

Continuing education is experienced by adults as a field of tension between needs and constraints. *Jeff Evans* (UK) and *Tine Wedege* (Denmark) took this into account in their discussion of people's motivation and resistance to learning mathematics, as interrelated phenomena. While *Wolfgang Schlöglmann* (Austria) posed this question: 'Lifelong mathematics learning – a threat or an opportunity?' and made some remarks on affective conditions in mathematics courses where many of the adult learners are unemployed and where attendance and a certain type of performance are required. These adults have not chosen to participate in a learning program. *Dubravka Viskic* and *Peter Petocz* (Australia) presented their investigations into adult mathematics students' ideas about mathematics and learning, based on the students' written reflections on the process of carrying out projects as part of a preparatory mathematics university course.



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## Pedagogic resources and the dialogic approach

Javier Díez-Palomar, Joaquín Giménez Rodríguez and Paloma García Wehrle (Spain) presented the results of a case study, "Cognitive trajectories in response to proportional situations in adult education", about learning of proportional situations in a school for adults. The objective was to find ways of overcoming the forms of exclusion that occur in everyday mathematics situations that involve the use of proportions for decision making. Among other conclusions they found that perlocutionary speech acts can encourage learning, but can also create barriers when the speaker uses a position of power that breaks with egalitarian dialogue. In her paper *Marian Kemp* (Australia) noted that it is important for everyone to be able to engage with quantitative materials, in particular tables, to enable them to extract information and make informed decisions, and she presented a study with first year undergraduate students to evaluate the effectiveness of an intervention workshop designed to promote these aims.

## Gender "mainstreaming"

*Inge Henningsen* (Denmark) discussed opportunities and challenges in mainstreaming that has been widely adopted by the international community as a strategy for equality. Mainstreaming of research on mathematics education means that gender, ethnicity, social class and other difference defining categories are involved consciously and explicitly in every research agenda. In mathematics education, curriculum, context, instruction and values have a gender dimension that should be acknowledged in research. Literacy surveys present intriguing instances of gender blindness – the paper points out how gender is a possible confounding variable in a number of comparisons. The paper contends that gender mainstreaming must be expected to play a positive role in the search for better research in mathematics education and a more inclusive teaching of mathematics.

## Issues for pre-service teachers and for professional development of tutors

*Terry Maguire* and *John O'Donoghue* (Ireland) reported how grounded research has contributed to the development of a model of professional development for tutors of adult numeracy. The model incorporates a view that professional development is not a one-off activity, but something that allows for the development of a wide range of skills and knowledge, increasing complexity and specificity in the context of a tutor's own lifelong learning. *Miriam Benhayón* and *Mercedes de la Oliva* (Venezuela) described the steps followed to design a remedial course in mathematics for adult participants within the bounds of a university study program offered to practising teachers with no bachelor's degree. They emphasised that the contribution of this work is related to three main ideas: the social work it represents in a nation like Venezuela where there is a great number of non-graduate teachers; the opportunity to break paradigms and negative beliefs about the learning of mathematics; and the characteristics of the suggested evaluation instruments. *Sally Hobden* (South Africa) reported of some of the language, numeracy, emotional and learning management struggles experienced by preservice teachers in an initial one semester "Mathematics Literacy for Educators" module.

## Roles for functional skills and understanding and commonsense

*John Gillespie* (UK) referred to the numeracy part of "The Skills for Life" surveys of adult literacy and numeracy in England that were carried out in 2002-3 for the Department



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for Education and Skills to meet their requirements. The findings confirm that for many, being “at a given level” is not meaningful for the individual, as notions of levels embody predetermined assumptions about progression and relative difficulty. In her analysis of “functional skills and understanding”, *Lene Østergaard Johansen* (Denmark) distinguished between four different analytical domains in adults’ lives (school, workplace, everyday life and democratic involvement) and considered functional skills from four different discursive perspectives (society/politicians, researchers, mathematics teachers, and the individual). The analysis emphasized that skills and understanding can be functional in one domain from one perspective and not functional in another domain or, from another perspective. *John O’Donoghue* and *Noel Colleran* (Ireland) reviewed their position on commonsense and adult problem solving and located their evolving understandings in the context of adult tutor training.

### Methodological issues

These were raised in many of the papers. Here we can mention as examples: the possibilities and limits of survey research (*Gillespie*); the role of ethnography in researching oral mathematics (*Knijnik*); appropriate methods for the analysis of interaction and discourse (*Diez-Palomar et al.*).

### Global issues

These were raised throughout the four group meetings, as can be seen from the summaries above. Throughout all the papers, there runs the thread of shared concerns and initiatives to promote social inclusion and social justice.

### Reference

Coben D. et al. (2003) *Adult Numeracy: Review of research and related literature*. London: NRDC.  
UNESCO (2000). *World Education Report 2000: The Right to Education: Towards Education for All Throughout Life*. Paris: UNESCO Publishing

All papers referred to are published on the TSG 6 website, [www.icme10.dk](http://www.icme10.dk) – Programme.

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