ICME 11

11th International Congress on Mathematical Education

Plenaries and Regular Lectures

July 6th to 13th, 2008
Monterrey, Nuevo Leon, Mexico
http://icme11.org

Mathematical Literacy in South Africa – an opportunity for shifting learner identities in relation to Mathematics

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Mathematical Literacy (ML) was introduced in schools in the Further Education and Training (FET) phase (grades 10-12, learners mainly aged 15-18) in South Africa in January 2006. The subject is structured as an alternative option to mathematics, and all learners entering the FET phase since January 2006 are required to take one or other of these two options. ML is defined as a subject driven by life-related applications of mathematics that must develop learners' ability and confidence to think numerically and spatially in order to interpret and critically analyse everyday situations and to solve problems (DoE, 2003). Emphasis in curriculum documents on developing 'mathematical' competence and confidence, and ways of being and acting in the world, highlights the aim of developing positive mathematical learner identities. Evidence from schools suggests that in practice, ML is not being offered as an open choice to learners. Learners with weak mathematical histories, competence and confidence are generally the ones being guided towards taking this new subject.

Earlier I explored the emergence of confidence (both empirically and theoretically) in relation to in-service Mathematics teacher learning within Wenger's (1998) Community of Practice perspective (see Graven, 2004). In that paper I argue that Wenger's complex model of interrelated learning components (meaning, practice, identity and community) with the addition of the component of confidence, provides a powerful framework for analysing mathematics in-service teacher learning. The notion of learning in relation to developing mathematical confidences and identities emerged as particularly important for participating teachers who did not have strong mathematical histories and had not themselves chosen to teach mathematics (their pre service studies had been in subjects other than mathematics). In June 2007 Etienne Wenger visited our university where he presented a seminar on "Practice, community and identity: current issues in social learning theory". During this seminar, a colleague of mine Erna Lampen, asked how notions of learning trajectories and identity relate to mathematics learning in classrooms when a key problem in school maths classes is that students don't want to be there, their trajectories are outside of the classroom and generally away from Mathematics. Wenger's response was that perhaps his theory 'was not ready for prime time' for school classrooms. He gave a variety of reasons including that in schools we tend to put skills and information before meaning (he gave the example of learning algebraic equations before they have any meaning) and that curricula focus on cognitive aspects of learning while within his theory identity should drive cognition. Indeed Wenger's perspective on learning did not strike me as particularly useful for investigating the nature of learning in the majority of the mathematics classrooms I had visited over the past two decades. However, notions of changing practices and identities are incorporated in various aspects of the ML curriculum documents and documents guide teachers to put meaning before skills by encouraging them to "engage with contexts rather than applying Mathematics already learned to the context" (DoE, 2003, p42). In addition reflecting on the teaching and learning I had observed in some ML classrooms the notion that teaching was the 'management of a journey with respect to identity' (Wenger, 2007) - in particular with respect to developing positive mathematical identities - resonated strongly.

In this talk I wish to explore the way in which Mathematical Literacy opens up opportunity for the development of mathematical ways of being in the world and the management of a journey with respect to identity. In doing so I will draw on data gathered by Hamsa Venkat

and I in a multiple case study research project as part of our work within the Mathematical Literacy thrust in the Marang Centre, Wits University. Our research work centrally involves a longitudinal case study, now in its third year, tracing the experiences of educators and the first cohort of learners taking ML in one inner city Johannesburg school as well as a series of visits to Mathematical Literacy classrooms in two other schools. This work has involved classroom observations, some video recording of lessons, as well as questionnaire and interview data from learners and teachers.

Key threads within the story I tell are that engagement with various 'real life' scenarios has in these case studies led to pedagogic shifts involving increased: classroom discussion and negotiation of meaning, emphasis on sense making and learner independence, and tentativeness and co-exploration on the part of teachers. Learner interviews indicate increasing mathematical participation, mathematical confidence, mathematical sense making, mathematical independence as well as some anecdotal evidence of changing ways of acting in the world outside the classroom and changing identities in relation to their participation at home and their role in the family. The story aims to highlight the features of ML and the implementation of it in these South African classrooms that appear to be salient in opening up the space for learning with respect to changing mathematical ways of being in the world – when as noted earlier – in many mathematics classrooms such a notion of learning may not yet be ready for 'prime time'.

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Time:
RL-5 on Sunday July 13
10:30 – 11:30

Location:
S06-C.P. Don Víctor Gómez Garza Auditorium – FACPYA Building