Dolores Corcoran and Sandy Pepperell

Formulating a Research Agenda on Mathematical Knowledge in Teaching

I am hesitant to make a contribution to this topic since my notions of what is either incomplete, problematic or ineffective about the core of established research-based knowledge about mathematical knowledge in teaching may be a function of my being an 'outsider' to the British educational system and/or a mathematics educator who deals only with primary teachers. However, I do consider that while there has been admirable work in the UK relating to mathematics knowledge in teaching, specifically the development of the Knowledge Quartet, this could be supplemented by further research (some forms of teaching experiment?) aimed at establishing for example if there are 'key representations' in relation to mathematical ideas on the primary/ post-primary school curriculum. The theoretical underpinning of pedagogy appears to differ from place to place across the world and perhaps that could be usefully problematised in the UK with regard to data handling/ measurement/ chance (for example) as bases for developing mathematical thinking. In fact each dimension of the KQ and many of its contributory codes warrants further research in different mathematical domains and at different school/class levels. If one accepts that mathematical knowledge is situated, social and distributed (Lave and Wenger, 1991) (and I do!) then that poses a challenge to the mathematics education community to research the best supports possible to enhance mathematics teaching (i.e. really good research based text books, computer programmes etc.).

A second area of mathematical knowledge for teaching which appears incomplete or at least disjointed is mathematical knowledge in teaching for social justice. There are people working in the UK on topics related to mathematics and equity issues and Boaler's research (2002) tells us it can be done (i.e. teach mathematics in a manner which favours equity) but in a country where banding and setting are common school practices, and UK students do not perform well in international comparative assessment tests like PISA in comparison to countries like Finland and even Ireland then research questions present themselves as to how, why and what mathematics should be taught with a more equable distribution of success in mathematics and uptake at more advanced levels in mind. These are not research issues distinct from mathematics knowledge in teaching since to play down or ignore the agency of teachers and teaching in relation to the mathematics knowledge to be developed is to do a disservice to both.

References

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