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Editorial

Knowledge Construction in Mathematics Education

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Mathematical knowledge in New Zealand schools is in transition again. As the latest in a history of curriculum initiatives and like its most recent predecessor, the new curriculum comes hard on the heels of consultation and debate about not only what will count as mathematical knowledge, skills, and competence but also how these are to be taught and learned. Answers to these perennial questions have moved over the past fifty years from a focus on the transmission of information to students, followed by an emphasis on knowledge and procedures, and onto a concern with reasoning, problem solving, communication and making connections. The new interest is with content, process and mathematical thinking. Student knowing, doing and thinking, taken together, are the cornerstones of the official policy document in mathematics.

The new demands placed on our students and teachers stand alongside a continuing belief in mathematics as a prime engine of economy, nation and identity. In a society in which multiculturalism plays a part in the fabric of everyday life, recognition is made of the merits of the knowledges and knowledge making practices of diverse communities. In addition, acknowledging the acceleration of a range of computational technologies and high speed mass communications, the new curriculum recognises that mathematics in schools needs to be relevant to workplace and life times that are 'entrepreneurial' and as yet unable to be fully comprehended. Less prescriptive than previous national curricula, it acknowledges that jobs and pathways of the future are no longer readily identifiable; nor indeed are they able to be quantified.

Curriculum change does not happen simply for the sake of change. The changes to curriculum have arisen through what some have called a complex political economy, involving the public, parents, politicians, and the media, as well as the corporate and the professional/academic sectors. Take the obsession with the press over literacy/numeracy standards. Consider, too, the parliamentary debates that have punctuated benchmarks for achievement. In addition, reflect on the debates/advocacy and the resulting shifts in political ideology in relation to the inclusion of diverse, indigenous and minority cultures. All these factors, among others, have had a part to play in the push/pull of recent curriculum development.

There are a number of synergies between curriculum development and changes in research practice, the most fundamental being that both expand our interpretation of what counts as knowledge. Although the official curriculum

supports specific kinds of knowledge, mathematical knowledge is not 'found' there. Similarly, knowledge is not 'found' by research practice, but is tested, contested and reconstructed in an ongoing process. This understanding follows a heightened awareness of the limits of the discipline's traditions that subsequently crystallised into a re-evaluation of research design. We now have at our disposal a suite of approaches, theories, methods and scholarship. Like curriculum knowledge, research knowledge is significantly informed by ideologies of the time.

Research reported in academic journals, explaining the historical, philosophical, cognitive, or social processes within mathematics education, has come a long way from wholesale acceptance of traditional canons of truth and methodologies. Tracking research reports in *MERJ* over the past 20 years provides us with powerful evidence of how research centred around common goals, is constructed, legitimated, challenged and transformed in particular times and particular contexts. Just as curriculum change involves negotiation and decision making, so too do changes in research practice. Research, as reported in this journal during the past two decades, "is a powerful means of keeping the negotiation and decision processes vivid" (Krainer, 2005, p. 77).

Reference

Krainer, K. (2005). What is 'good' mathematics teaching, and how can research inform practice and policy? [Editorial]. *Journal of Mathematics Teacher Education, 8*(2), 75-81.