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Editorial

Mathematics Teacher Education: Continuing Challenges

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The five papers included in this fourth edition identify a number of important challenges that face mathematics teachers as they continue their journey to become effective practitioners. As attested by the first article, continual teacher development and change is not an easy process. Time and reflection seem of essence to this process. The emerging themes delineated in all the articles are:

What is our understanding of mathematical knowledge?

What processes assist us in reaching some understanding of our own conceptions of mathematics?

How do our beliefs and values influence the types of mathematics we privilege in the classroom?

In out initial training programs, do we cater for the diverse cultures that are existent in many classrooms today?

The first paper by Jaberg, Lubinski and Yazujian focuses on teacher change. In this instance the change is reported as an experienced teacher's personal journey over a two-year period. During this time, she worked collaboratively with researchers in examining ways of establishing a learning environment that encouraged and supported student's mathematical thinking. As she relates her personal journey, Teresa reflects on the struggles she experienced with making sense of her own understanding of mathematics. She also shares the changes she experienced in her beliefs about how students learn mathematics. This implicitly impacted on how she taught mathematics in the classroom. In the concluding phases Teresa stresses the importance of her reflection on student learning in sustaining her evolving role as a mathematics teacher.

The second paper by Barrett, Jones, Thornton, Mooney et al reports on working with two novice teachers. Both participated in a two-year Professional Development program, which aimed to enhance the practice of elementary teachers. Teachers were encouraged to pose worthwhile mathematical tasks, ask both responsive and extending questions, and listen to students' responses to assist in promoting engagement and thinking. The evidence presented in this paper suggests that the beliefs that teacher's posses with regard to pedagogy and practice can be so embedded that change becomes a difficult process. While Anne was seem as presenting worthwhile mathematics tasks, it is conjectured that her belief about

her own ability with mathematics resulted in a reluctance to use children's solutions for the building of new mathematical knowledge. By contrast Rachel, who believed that mathematics was rule orientated, structured and is learnt by imitation, continually demonstrated the correct mathematical procedure and ensured that children in her class adopted this procedure.

In the third paper Vale reports on work with pre-service teachers and continues the discussion on beliefs about mathematics and mathematical pedagogy and the impact they have on beginning teacher development. It seems that the most valued learning outcomes for these pre-service teachers were solving mathematics problems in everyday situations, estimating calculations and measurement and performing basic operations without calculators. Further probing indicated that when referring to everyday problems students seemed to be valuing routine word problems over real world inquiry. It also seems that spatial concepts, visualisation and the use of calculators in the classroom were some of the least valued outcomes. So while the most valued outcomes reflected current trends in curriculum documents, there were many aspects that these pre-service teachers still did not value as part of their everyday teaching.

In their article on Quantitative Literacy for pre-service teachers via the internet, Watson and Moritz explore ways of addressing some of the issues identified in Vale's research. Their project focussed on assisting pre-service teachers to see the relevance of quantitative literacy to daily life and to prepare, plan, and implement lessons using newspaper articles as a teaching resource. The paper summarises pre-service teacher's plans, including their reflections on the classroom implementation of these ideas. While many students expressed concerns at the start of the project, many reported on 'conversion experiences' indicating that they felt that the activity assisted them in beginning to link real world context with numeracy ideas. It also raised their awareness of the high usage of mathematics in everyday situations. The difficulties that occurred are related to the implementation of the project. It seems that while the information was web based, only one student used the web in the classroom. Also nearly all students showed reluctance to being involved in web-based discussions. These issues represent challenges for all teacher educators as we move into the 21st century.

The final article by Patadia and Thomas addresses the important issue of recognising the multicultural aspects of classrooms in our initial teacher training and whether teachers are being trained to be active participants in such environments. It seems that in New Zealand, while many mathematics educators acknowledge the context of these classrooms, few take this into account their mathematics education course. The debate continues around mathematics as a neutral and value free discipline or mathematics as negotiated meaning impacted on by the social, linguistic and cultural background of the students. The mathematics educators readily accepted that they had limitations due to their own cultural backgrounds, but most valued their diverse multicultural society and had some good, clear ideas on how these issues could be approached in the future.

We hope that this collection of papers provokes further discussion and debate in these important areas of mathematics education.