EDITORIAL

In this, the first issue of 2004, there are five articles, four of which are focused on science education and one on mathematics education. The connections across our two fields are evident. The two articles by Nikita Patterson and Karen Norwood in mathematics education and Kathie Black in science education both address some of the key elements in research on teacher education: new teachers finding their own teaching identities; issues of subject knowledge; and the take-up of what is taught in pre-service courses and its "transfer" into schools. They both draw on ethnographic, qualitative traditions of research in order to gain insight into the perspectives of the people being researched. Gerry Corrigan and Neil Taylor also look at pre-service science teacher education, focusing on the development of self-regulated learning (SRL). There is a great deal of interest in SRL within mathematics education also. Their research draws on an interpretative and qualitative methodology. All three articles take a constructivist perspective on learning and discuss, to a greater or lesser extent, the implications for an approach to teaching consistent with constructivism. Continuing the theme of studies in teacher education the article by Chi-Chin Chin examines the effects of a well-designed course in a science museum on a number of aspects of learning to be science teachers. This qualitative study looks at a range of dimensions of the experiences of 21 students. The context of learning and the relevance of school knowledge beyond the walls of the school engage both science educators and mathematics educators. Finally, the article by Din Yan Yip, Ming Ming Chiu and Esther Sui Chu Ho looks at gender differences in performance on the science element of the international OECD-PISA survey. That survey and its predecessors have had a very substantial influence, not all positive it must be said, on science and mathematics education across the world and the issue of the differential achievement of boys and girls is a particular concern to both communities.

Our aim in the *International Journal of Science and Mathematics Education* is, as we said in the first editorial, not to just to publish high-quality articles in science education and mathematics education such as those in this issue, but also to facilitate and encourage discussion and dialogue between the two communities. Judging just by the articles appearing in

this particular issue that can certainly be about a number of areas of common interest. There are methodological issues concerning the fruitfulness and generalisability of qualitative studies when looking for desirable features of teacher education. From the point of view of values, a number of the articles express, explicitly or implicitly, what they consider to be desirable features of the teaching and learning of science or mathematics. In engaging with the types of content and skills preferred by female and male learners and the consequences of those conclusions the OECD-PISA article is also engaging with values. Concerning teaching and learning styles, constructivism and sociocultural theories appear in research across the two communities, sometimes without problematising what might be tensions and contradictions between them. Whilst Piaget's work has been well-known for some decades and has formed the basis of current approaches in education, the Vygotskian influences are rather more recent and in many instances have been assimilated into the dominant perspective without sufficient theoretical work on our part. Again, this is an aspect of our work that would benefit enormously from dialogue. Looking at educational theory with a sociological gaze, we might ask questions about different pedagogical forms arising from political and cultural changes in terms of their effects on teachers and students and, in particular, on different social groups. Context, relevance and transfer of knowledge are notions that have been examined by the literature on situated cognition. The issue of transfer across contexts, both for students from school to out-of-school situations, and for student teachers from the university or college context to school classrooms, is not simple.

We could continue with the identification of issues of common concern. Our two communities have developed separately and career structures in academia mean that we attend different conferences and publish in different journals. The few places around the world in which science educators and mathematics educators interact, however, indicate just how much we can learn from dialogue. At any time one community may be engaging in issues that have been less developed in the other community and *vice versa*. We must also note the decreasing numbers of students studying mathematics or science at high levels in many countries, with the result that fewer people enter the teaching profession in these subjects each year. This is a problem that leads to a downward spiral: fewer inspired and inspiring teachers leads to fewer students studying science and mathematics, resulting in even fewer students taking these subjects in higher education. As researchers in education, with one face towards practice and one towards theory, these issues matter enormously.

We welcome articles on science education and mathematics education. We also invite responses to the articles appearing in this journal and especially would welcome articles that present dialogue or offer perspectives that reach across the two communities to the benefit of us all.

Stephen Lerman

Department of Education,
South Bank University,
London, UK