Developing New Teacher Learning in Schools and the STEM Agenda

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and Celia Hoyles

The purpose of the Group was to make explicit ways of supporting the preparation of teachers in schools where the reality is that expertise may be thin on the ground. There is a paradox, schools are short of mathematics and science teachers whilst at the same time required to provide more of them.

This was explored by drilling into experience of teaching and learning by teachers or beginner teachers of mathematics and science who make no pretence at being mathematics specialists. Experience came from practice drawn from policy, from research and from scholarship. Short stimulus presentations from the team in the first session were followed in the second session by short presentations from participants who bid for time in between session 1 and session 2. There was a summary of key issues by the respondent to conclude each session.

Discussion illustrated the importance of paying attention to the power of international collaborations; that the problem is recurring and so political networks are very important. Experience in the UK suggests the need for strategy to maintain unerring focus on mathematics; evidence-based interventions; developing excellence in teaching mathematics across all phases of education by sharing knowledge and practice; commitment to placing teachers' needs and goals at the core; commitment to working in partnership to influence policy and practice. These are developed through interlocking networks: research networks, teacher networks and head teacher networks. Outcomes of the group included a sense of direction and purpose in the reality of preparing new mathematics teachers through school-centred approaches; an international network to sustain over time and lead to collaborative intervention projects; ways for mathematics teacher educators to position their work alongside policy and practice in schools. A systematic and politically aware strategy is an evident next step for Australia.

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Professional development for teachers needs be sustained over time; is collaborative; and knowledge creation integral. To date there is no explicitly agreed definition of STEM but STEM-ness includes authentic problem-solving; working collaboratively; and builds on scientific, mathematical and design principles and reasoning.

The first session (Tuesday 26th July) was attended by 15 people from Australia, Colombia, Denmark, England, Hong Kong, Mexico, Spain, USA. The second session (Friday 29th July) was attended by 11 people from Australia, England, Spain, Taiwan, USA.

Presentations were offered

Barbara Black, Lesson Study; Dr Lin Phillips, Action learning; Dr Jeanne Carroll, Mindset and performance; Professor Pat Drake, Out-of-field as a resource; Associate Professor Colleen Vale (Deakin University, Australia), Out-of-field as a contested concept; Dr Mary Stevenson (Liverpool Hope University, UK), Mathematics subject enhancement and in-depth mathematical understanding; Dr Jeanne Carroll (Evidence to support growth mindset and difference); Associate Professor Inge Koch (Australian Mathematical Sciences Institute, University of Melbourne, Australia) 'Choose Maths' initiative and scaling up; Professor Dame Celia Hoyles key questions and factors to take forwards. A longer report summarising the input and discussion is available from the Organiser until December 2017.

International network

Barbara Black, Jeanne Carroll, Pat Drake, Ignasi Florensa, Celia Hoyles, Inge Koch, Jian Liu, Lin Phillips, Mary Stevenson, Colleen Vale, Kai-Lin Yang.

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