

SECOND BSRLM SUBMISSION TO THE MATHEMATICS INQUIRY¹

In response to the Smith Inquiry's change of remit, and in particular with regard to the proposal for National Network/Centre for Excellence in mathematics teaching, the BSRLM executive called a group together at its Oxford Conference to discuss research related issues, with a view to making this, a further submission to the inquiry.

The following comments are made to reinforce, and in addition to, (i) the ACME call for such a network for CPD and the government's positive response, and (ii) the comments made about CPD and research generally in our first submission. We suggest that the National network will be designed to provide opportunities for CPD accordingly.

- 1 The CPD evidence base is fragmentary - includes rhetoric of success and little systematic monitoring/evaluation. It is unclear what is distinctive about mathematics vis-à-vis other subjects; the needs of secondary mathematics teachers vs primary; specialist vs non-specialist; EPD vs later career stages; coordinator/Head of Department vs other teachers.
- 2 Research studies currently reporting which may usefully inform network model: 'Creating and sustaining effective professional learning communities'²; 'The factors influencing the transfer of good practice'³; 'The Impact of CPD'⁴; and NUT EPPI review of CPD.
- 3 Research on 'Teachers' Perceptions of CPD'⁵ found: 'one size fits all' viewed very negatively; time to reflect upon/implement new practices valued; renewed emphasis on autonomy and professionalism sought; management/curriculum coordination training identified as greatest CPD need. Management of whole school/ individual CPD and individual needs identification processes were also often found to be not effective.

¹ These notes were made following a BSRLM working group meeting (7/06/03) on CPD for the Mathematics 14+ (Adrian Smith) Inquiry, and circulated to the executive and membership for comment.

² Bristol (McMahon, Thomas)/Bath (Stoll, Bolam, Wallace) funded by GTC, DfES, NCSL to identify characteristics of effective learning communities within and across different school settings and the key enabling/inhibiting factors implicated in creating, managing and sustaining them.

³ Sussex and DEMOS funded DfES

⁴ Warwick (Harris et al)/ Nottingham (Day) funded by DfES to identify current evaluation practice, and models of CPD evaluation, and develop tools to evaluate and improve the effectiveness of CPD.

⁵ MMU (Hustler, McNamara, Campbell)/EDS (Howson) funded DfES.

- 4 Cascade training is persistently identified as a weak link in CPD programmes. Subject knowledge and understanding are identified as key to confidence in dissemination role⁶.
- 5 Need for CPD to ‘involve teachers in change’ rather than ‘change teachers’⁷. Extended programmes (e.g. 20 day courses) are more effective than short courses in changing beliefs and particularly practices⁸.
- 6 Subject knowledge, often a particular issue in mathematics, is best tackled in the context of teaching (i.e. pedagogical content knowledge). Generally, CPD programmes should relate theory to practice and provide time for informed reflection with colleagues⁹.
- 7 The practice embedding phase of CPD is most difficult to manage and needs opportunities and time to (a) share, discuss and reflect on practice, and (b) evaluate and develop, or adapt, curriculum, pedagogy and resources. This implies a diffusion rather than ‘delivery’ model. Support structures are needed to support such a model e.g. teacher’s group discussion of video evidence of practice, group development of resources etc.
- 8 Teacher development should be seen in the context of (a) the school as a ‘learning organisation’, where deep whole school/department change is managed and promoted by a distributed leadership team, and (b) ‘research and development work’ into teaching/teacher development, in which BSRLM would hope to play a supportive role.
- 9 There is a need to motivate mathematics teachers in particular to take up CPD: in shortage areas like secondary mathematics particularly, promotion does not usually depend on prior CPD record.

The implications of all this for the planning of a CPD programme and network would seem to include the following:

- 1 The building of local, regional and national teams and networks to facilitate mathematics CPD.
- 2 The integration of CPD with curriculum development and enhancement activity (e.g. mentoring, ambassadors, links with professional associations) and classroom/ school-based research and development work at national, regional/local /school levels into mathematics teacher/teaching development.
- 3 The operating costs for national network/ local centres to be minimised and economies to be effected where possible by liaising with existing networks (e.g. LEA mathematics advisors/numeracy consultants, ATM/MA). Where there still

⁶ Harland and Kinder (1992) re 20 day courses; Earl et al (2000), OfSTED (2000) re the NNS.

⁷ LAMP (Ahmed, 1987: Better Mathematics, London, HMSO).

⁸ Askew (1997) Effective Teachers of Numeracy, London, King’s College.

⁹ After the style of LAMP (see above) and RAMP (Ahmed & Williams, 1991, West Sussex Institute of HE)

exist local LEA teachers' centres equipped with specialist personnel and resources these would be ideal sites to provide networking facilities and encourage teachers' groups to form to work on aspects of curriculum development and teaching practice.

- 4 Partnerships between mathematics educators/researchers in HEIs, professional associations (e.g. ATM and MA) and local/regional specialists / leading teachers should be resourced to take forward the mathematics research and development agenda.
- 5 At school and local level, management and peer supported but teacher-centred self-diagnosis of development needs, together with local, responsive teams that can design activity around these.
- 6 An entitlement for each school and each individual teacher could be developed and an allocation of resources, including time, to allow it to happen: there needs to be a right to and an expectation of CPD to ensure it is ongoing.
- 7 Where possible schools' inset programmes could be tapped into to provide affordable quality CPD without implications for supply costs/staffing. 'Alternative' strategies could be considered including paying teachers to attend CPD during weekends/ holidays.
- 8 Accreditation systems could be developed for schools/department (e.g. foundation/ intermediate / advanced 'mathematics quality award for CPD') in a model that would involve prolonged engagement with the network. Also it should offer links to HEI accreditation through Certification, Diploma and Masters. (See appendix for example.)

We hope these comments will help the inquiry to develop appropriate models for effective CPD through the network.

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APPENDIX

Illustrative ‘Mathematics quality award for CPD’ scheme (which could link to accreditation via HEI Certificate, Diploma or Masters units)

- Foundation award: individual skills audit, whole school/department day and follow up sessions, based on differentiated self-study, peer coaching, reflection on video evidence of classroom practice.
- Intermediate award: evidence of further enhancement including (1) addressing individual skills upgrading in subject knowledge through self study, peer coaching; (2) addressing sharing of good practice/pedagogy through peer observation; and (3) meetings of coordinators (Key Stage 1 and 2) /head of department and deputy with network adviser.
- Advanced award: individual skills audit, further whole school/department day, based on differentiated self-study and peer coaching, and evidence of sharing of good practice in mathematics pedagogy both within schools and across neighbouring schools.

Some possible models of provision that could feed into school profile for kite marking

Model 1

Whole school/department: programme involving one-off day differentiated input and a number of follow-up ‘twilight sessions’, differentiated self-study, evidence-based inquiry, peer coaching and reflection on video of classroom practice.

Model 2

Individual: programmes of study involving a number of short series of courses (e.g. 5 x half day sessions) developed by HEI, LEAs and professional associations and accredited by HEIs to act as free standing units. These might be subject knowledge, pedagogy or management focused.

Model 3

Teacher groups: funded to share, discuss and reflect on mathematics practice, develop resources or conduct research and evidence-based inquiry supported by HEI/LEA/ professional associations.

Model 4

HEI accredited [credit transfer schemes] specialist courses involving practice based elements. These might provide specialist support and endorsement for:

- Leading maths coordinators / heads of department
- Leading maths teachers
- Leading maths ITT/ induction mentors

British Society for Research into Learning Mathematics

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BSRLM is associated with an e-mail list in operation to facilitate effective communication between members and others in mathematics education worldwide. To join this list, send the single word message <subscribe> to <maths-education-request@nottingham.ac.uk>

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