

NATIONAL POLICY, DEPARTMENTAL RESPONSES: THE IMPLEMENTATION OF THE MATHEMATICS STRAND OF THE KEY STAGE 3 STRATEGY

Hamsa Venkatakrisnan and Margaret Brown

King's College London

In this article we use data from two mathematics departments within one local education authority implementing a national reform policy – the mathematics strand of the Key Stage 3 (KS3) Strategy – to explore the contrasts in the interrelationships between the views of, and goals for, mathematics teaching and learning that teachers see within the policy compared to their own views and priorities. The ways in which these contrasting interrelationships in views and goals impact upon the profile of the department in the context of policy implementation are considered.

INTRODUCTION

Evidence from a broad swathe of previous reform efforts points to the interpretation of policy into practice, rather than Evidence from a broad swathe of previous reform efforts points to the interpretation of policy into practice, rather than a more direct correspondence between the two (Bowe et al., 1992; Pollard et al., 1994; Askew, 1996). This evidence suggests that local contexts are of importance, and led to a shift in policy implementation research away from measures of 'fidelity' of implementation, towards a move to understanding the variations in response. In larger-scale studies, this shift resulted in typologies of school responses to external reform efforts (e.g. Corbett and Wilson, 1991). Smaller scale ethnographic studies pointed to the ways in which these interpretations were filtered through teachers' values and goals (Broadfoot and Osborn, 1988), and the local cultures of work that they were based in (Mac an Ghail, 1992). Ethnographic studies focused too, on the conflicts faced by teachers as they negotiated the implementation of policies with underlying philosophies of teaching and learning that they felt stood at some distance from their own values (Hammersley, 1999).

THE MATHEMATICS STRAND OF THE KEY STAGE 3 STRATEGY

The reform policy under consideration in this article is the mathematics strand of the Key Stage 3 Strategy (referred to henceforth as the 'mathematics strand'). This policy was launched nationally in English secondary schools in September 2001. The policy was modelled closely on its primary level predecessor, the National Numeracy Strategy (NNS), which had been introduced in September 1999. The mathematics strand carried through the stress within the NNS on improving pedagogic practice and securing progression through the curriculum for students. Amongst the key features of the mathematics strand were:

- Structured 3-part lessons: starter, main activity, plenary, and a call for 'pace' in lessons.

- A curriculum written in the form of numerous specific learning objectives, set in ‘Yearly teaching programmes’, each pitched at a narrow range of National Curriculum levels, set out within the KS3 ‘Framework’ (Department for Education and Employment, 2001)
- Pedagogy – predominant use of interactive whole class teaching
- Training/support programme for KS3 maths teachers, provided by local KS3 Strategy mathematics consultants

Data from an earlier small-scale study that we were involved in tracing teachers’ views on the implementation of the pilot projects of the mathematics and English strands (Barnes *et al.*, 2003) showed some areas of common ground in implementation of the mathematics strand, but in comparison to the early stages of implementation of the NNS where a much greater degree of ‘fidelity’ was apparent, there were widespread indications that policy implementation in different schools varied in content and degree. Variations were found in the following key areas:

- Teachers’ views of the policy varied from highly positive to highly negative, although the majority of teachers stated their support for its overall aims.
- The degree to which interactive teaching was used was highly variable – in many departments, a more interactive style was restricted to the starter activity with little change in pedagogical style in the rest of the lesson.
- About half the sample within the study had changed their schemes of work to align with the curricular format and timeframes given in the draft Year 7 Framework (Department for Education and Employment, 2000); the others had either checked their own schemes for coverage of the ‘key objectives’ given in the Framework, or retained their existing schemes with no reference to the policy’s curriculum.

We used this evidence of partial and varied interpretations of the policy to examine in more detail the ways in which two departments using contrasting practices and structures for organising teaching and learning mathematics at KS3 decided to implement the mathematics strand. These two departments, located within one local education authority, came into implementing the policy through their participation in one of the fifteen KS3 Numeracy pilot projects that began in 1999 alongside the introduction of the NNS following the recommendations of the Numeracy Task Force in their Final Report (Department for Education and Employment, 1998).

In this article, we focus on the contrasting decisions taken by the heads of mathematics in the two schools on how to incorporate the policy into their departmental working – decisions that were taken at the end of their first year of participation in the Numeracy Pilot (Summer 2000), as they prepared to meet the first cohorts of students in Year 7 that would have experienced the NNS in their primary schooling.

We collected data on departments' views of the Strategy through attending the half-termly meetings of the Pilot project, taking notes of the proceedings, speaking informally with the representatives from participating departments, and collecting documentation. We also carried out interviews with the Numeracy Coordinators and Heads of department from the focal schools, and the KS3 Numeracy Consultant leading the project.

THE TWO SCHOOLS

The two schools that we focused on were 11-16 co-educational comprehensives with intakes that were negatively skewed in terms of attainment profiles at KS3 and GCSE in relation to national figures. Additionally both schools had rolls in which a little over 50% of students were eligible for free school meals.

The schools were chosen because of the contrasts in their organisation of classroom practice at KS3. In the first school, Evenscroft, teaching was based around the use of a differentiated textbook scheme – Key Maths. Apart from an initial assessment period in September of Year 7, setted grouping was in place across KS3. Whole-class teaching using the textbook scheme formed the predominant model of pedagogy. The second school, Bradstone, used SMILE – an individualised learning card scheme - across KS3, in which students were set individual programmes of work on different topics and levels. Mixed-ability grouping was in place throughout KS3. Teaching at Bradstone in KS3 consisted of a split between choosing appropriate tasks, supporting individual students with their learning, and monitoring progress. It was important to note that in both schools these respective models of organising learning were the results of decisions taken by their heads of department, both of whom were proactive about making changes in structures if they perceived these to be necessary.

VIEWS OF THE MATHEMATICS STRAND/LOCAL PRIORITIES

Different views of the mathematics strand were expressed over the course of the first year by the heads of department at the two schools in the Numeracy pilot meetings. Bradstone's use of individualised learning clearly conflicted with the mathematics strand's advocacy of whole class teaching within the '*recommended approach to teaching*' (KS3 Framework, p.26). Many of the video exemplars of pedagogic practice and curricular frameworks which were used to focus discussion within these meetings were based on a whole-class teaching model, and therefore restricted Bradstone's opportunities to participate whilst also being of limited relevance to the school in terms of helping them to improve existing practices.

There were also clear differences in the priorities of the two heads of departments in terms of what they felt needed changing. Beena Charan, the head of department at Evenscroft repeatedly expressed her dissatisfaction with inactive teaching:

“I think you know, the kind of teacher who says ‘Right, page whatever, questions 1-20’ and then just sits at the desk for the rest of the lesson.”

In relation to this priority for change, she viewed the mathematics strand in very positive terms, seeing within the policy some levers on pedagogy that would help to effect moves to a more active teaching style:

“I think staff have to plan their lessons a lot more as well. You can’t just go into a lesson and say ‘Right, Page 53 of the textbook, Questions 1-20’ because it doesn’t work any more. You’ve got to plan your lessons and you’ve got to think of an oral and mental starter and a plenary and what you are going to do in the middle. So it breaks up the lesson a lot more as well.”

There was therefore, a high degree of match between personal priorities and levers within the reform policy that could help to achieve these objectives, levers that were applicable to her local context of practice because of their use of whole class teaching, to effect changes that she viewed as beneficial.

Beena’s formal incorporation of the policy in Summer 2000 consisted of writing sets of mental and oral starters into each unit of work in their Year 7 scheme, buying resources that supported the move to more interactive teaching styles such as pupil white boards and loop cards, inviting the Consultant in to talk to her department about the use of three-part lessons, and then supporting and monitoring this use across the department. She retained their existing schemes of work at KS3 in an unchanged format:

“We’ve kept the order, but we’ve fitted the National Numeracy Strategy objectives, you know the key objectives to **our** scheme of work rather than the other way around. We cover all the objectives but not in the order they say because I don’t think that’s important.” (original emphasis)

The policy model of differentiation at three levels was also not viewed as an important priority:

“I think differentiation – that has been on board for years, hasn’t it, and I think people have worked out their own strategies for dealing with it.”

Her enthusiasm for the policy therefore, was quite selective, and restricted to the aspects that served her local priorities for improvement.

Diana Norton, the head of department at Bradstone did not see any such congruence of goals within the mathematics strand. She commented that on the fact that whilst the numeracy focus and the notion of building through from primary school practices were useful, the extension of the degree of prescription given within the NNS was inappropriate for secondary teachers:

“We **are** specialists, and it [the maths strand] doesn’t particularly treat us that way. It attempts to tell us **what** to teach, **how** to teach, **when** to teach it. Some of those things will have benefits, but some of them are just far too restrictive.” (original emphases)

Her departmental priorities at that stage were focused on KS4 and the changes that had been made to the GCSE syllabus, but she acknowledged that given the announcement of the national rollout of the KS3 Strategy in the following year,

changes to KS3 were inevitable. Her aims focused on finding a response that acknowledged their participation in the Numeracy pilot whilst retaining the aspects of their organisation that she felt were important – the use of SMILE and mixed ability grouping - and simultaneously addressed her local priority of wanting to improve the conditions for learning in classrooms. The problem that she focused on as needing improvement was the level of movement around classrooms by students looking for tasks:

“It’s in terms of cutting down the interaction between the students, and the necessity to find cards and find equipment.”

Her solution was to modularize their use of SMILE, with the modules created on the basis of the topics and timeframes given within the sample termly plans detailed within the draft Year 7 Framework version available at that time. This structure meant that unlike before, students within classes would now be working on the same set of topics. Information and supporting resources for mental starter activities had been disseminated earlier in the year, but Diana did not provide any guidelines or engage in discussion on how to teach within the modified SMILE structure.

Diana’s incorporation too therefore, whilst driven initially by a desire to comply with policy visibly in some way, was still focused firmly on local priorities for improvement, and selective about the aspects of policy that she chose to accommodate.

Interviews with the teachers in both departments towards the end of the first year of implementation (Summer 2001) indicated that they were positive about the ways in which their respective models of policy incorporation had impacted on students.

THE CONSULTANT’S VIEW

Keely Horsham, the local KS3 Numeracy Consultant, had considerable experience of working within mathematics education in teaching, management and advisory roles. Her view towards the end of the first year of implementation (Easter 2001) reflected the views that I had seen developing in the Pilot meetings over the previous two years. She praised Beena’s clarity of vision and her ability to channel the resources available into securing the improvements that she wanted, and commented too on the raised profile that had been secured as a result of her willingness to instigate changes in departmental practice:

“They [Evenscroft] are always at the forefront of everything”

Whilst the two schools had begun their participation in the Numeracy Pilot at similar positions in relation to student attainment at KS3, Evenscroft’s enthusiastic response to the pedagogical aspects of the policy and the relevance of these aspects to their existing model of teaching appeared to have conferred higher status and profile than Bradstone’s more low-key incorporation of the policy’s curricular format.

DISCUSSION

It was important to observe in this study and in our earlier findings that positive and negative views of the policy were both associated with selective implementation. Beena's positive view of the policy did not lead to a more wide-ranging implementation. The high profile she achieved appeared to link to the acceptance of the backcloth of whole-class teaching and a congruence of goals relating to improving pedagogic practice. This allowed for the constructive use of the tools offered within the policy – three part lessons, interactive resources, use of objectives. Bradstone's incorporation of mental starters and Diana's use of the Framework's curriculum as the basis for their Year 7 scheme did not confer this kind of status – the retention of SMILE and the department's unwillingness to embrace whole-class teaching within the modified structure (although they used whole class teaching in KS4), continued to hamper the degree to which teachers could contribute or gain from discussions related to the policy.

Hargreaves (2003) and Fullan (2003) have criticized the narrow agenda associated with many reform policies. The mathematics strand in its textual form, and in the range of aspects covered in the meetings of the Numeracy Pilot in this study, appeared to have considerable breadth, with discussions ranging across curricular, pedagogical, assessment and management issues. Many of these discussions though, were predicated on the use of whole class teaching, and from Bradstone's perspective, Fullan's concerns about policy agendas were very real:

“a form of performance training that provides intensive support but only in relation to highly prescriptive interventions” (p.7)

The data presented in this article suggests further that the implementation of the mathematics strand relates more to prescribing pedagogy than other aspects of teaching and learning. Beena's attention was directed almost exclusively at improving teaching; Diana referred almost exclusively to ways to improve learning. Beena's views pointed to an underlying sense that learning could and should be directed, at teacher and student levels – a view reflected in the policy texts; Diana viewed learning as a much more autonomous and individual process, again at teacher and student levels – a view at odds with the directions of the policy. Philosophies and goals also then, appeared to contribute to the differences in profile that ensued.

Recent reviews of the implementation of the mathematics strand (Ofsted, 2004), whilst stressing that implementation of the policy has led to improvements in mathematics teaching, have underlined the dangers of an over-emphasis on teaching without an adequate emphasis on learning:

“However, in some schools, pupils are over-dependent on teachers and there is insufficient emphasis on using independent, collaborative and oral work to encourage pupils to grapple with ideas.” (p.23)

The data presented here leaves questions as to whether the legacy of the mathematics strand will be a shift to more teacher-directed pedagogic styles, with less room for the more independent kinds of learning that Diana wishes to encourage.

REFERENCES

- Askew, M. (1996). 'Using and Applying Mathematics' in schools: reading the texts. Implementing the Mathematics National Curriculum: Policy, politics and practice. D. C. M. Johnson, A. London, Paul Chapman Publishing Ltd.
- Barnes, A., Venkatakrishnan, H. and Brown, M. (2003). Strategy or Straitjacket? Teachers' views on the English and mathematics strands of the Key Stage 3 National Strategy: Final Report. London. Publisher
- Bowe, R., Ball, S.J. with Gold, A. (1992). Reforming education and changing schools: case studies in policy sociology. London, Routledge.
- Broadfoot, P. and Osborn, M. (1988). "What professional responsibility means to teachers: national contexts and classroom constants." British Journal of Sociology of Education 9(3): 265-88.
- Corbett, H. D. and Wilson, B.L. (1991). Testing, reform, and rebellion. Norwood, N.J, Ablex.
- Department for Education and Employment (1998). The Implementation of the National Numeracy Strategy: The final report of the Numeracy Task Force. London. Publisher
- Department for Education and Employment (2000). Framework for teaching mathematics: Year 7. Suffolk. Publisher
- Department for Education and Employment (2001). Key Stage 3 National Strategy: Framework for Teaching Mathematics, Years 7, 8 and 9. London. Publisher
- Fullan, M. (2003). Change forces with a vengeance. London, RoutledgeFalmer.
- Hammersley, M., Ed. (1999). Researching school experience : ethnographic studies of teaching and learning. London, Falmer P.
- Hargreaves, A. (2003). Teaching in the knowledge society : education in the age of insecurity. Maidenhead, Open University Press.
- Mac an Ghail, M. (1992). "Teachers' work: curriculum restructuring, culture, power and comprehensive schooling." British Journal of Sociology of Education 13(2): 177-200.
- Office for Standards in Education (Ofsted) (2004) The Key Stage 3 Strategy: evaluation of the third year
- Pollard, A., Broadfoot, P., Croll, P., Osborn, M. and Abbot, D. (1994). Changing English Primary Schools: The Impact of the Education Reform Act at Key Stage 1. London, Cassell.