BACKGROUND

This study has explored aspects of the embedding of the National Numeracy Strategy (NNS) within a national context of rapid educational change, and in particular the recent burgeoning of the ‘audit culture’ (Power, 1994). Our interest is in the ‘context specificity’ (Reynolds, 1998) of such embedding as active local mediation (Woods, 1995; Osborn et al., 1997) and our focus is on the numeracy coordinators’ and their colleagues as a ‘community of practice’ (Lave & Wenger, 1991) ‘created over time by the sustained pursuit of a shared enterprise’ (Wenger 1998: 45).

Themes: tensions in practices, professional accountability and discourse

Tensions emerged in our reading of teachers’ accounts of practice, professional accountability and discourse. The first tension was between developmental and supervisory coordinator practices. Historically focused upon ‘developmental’ practices such as dealing with resources, being a ‘critical friend’ (Osborne & Black 1994) and a collegial ‘educationist’ (Millet, 1998), the coordinators’ role has recently extended along the more ‘supervisory’ lines of monitoring and being an ‘agent of imposed change’ (Millett & Johnson, 2000). The second tension was between ‘externally imposed’ and ‘self-regulated’ (Poulson, 1998) professional accountability; it concerns how teachers warrant their practices and also has implications for notions of professional identity. The third tension was between the ‘ecological’ and ‘performance’ registers used in discoursing activities and professional warranting. The term ‘register’ we use here to mean discourse in ‘particular configurations … in a particular situation’ (Halliday, 1975: 126). ‘Performance’ registers largely focused upon ‘teaching’ as ‘effective’ practices and learning as quantified outcomes, as in National Tests, Ofsted inspections and targets. ‘Ecological’ registers were more concerned with collegiality, learning as process and understanding, and teachers’ values (Bottery & Wright, 1996). Discursive practices carried such registers in mixed rather than pure form, as evidenced in the dynamic process of ‘juggling’ engaged in by coordinators (McNamara & Corbin, 2001; Stronach et al., 2002).

Tensions as liminal processes: marginality and peripherality

Metaphors of ‘juggling’ with different registers and ‘hopping between discourses’ (Jeffrey, 1999) invoke the teacher ‘self’ as increasingly ‘fragmented’ by curricular and managerial change (Troman, 1996). They imply attending to ‘liminalities’ (Turner, 1982), boundaries or thresholds rather than fixed and unified identities. Previous research has indicated states of ‘betweenness’ or ‘becomings’ in teaching with attendant problems of ‘managing marginality’ (Woods, 1993, 1995). These tensions in ‘self’ and the way it is discoursed are enacted in ‘communities of practice’ and ‘communities of learning’. Key ‘indicators’ of a ‘community of practice’ are: ‘shared ways of engaging in doing things together’; ‘shared discourse reflecting a certain perspective on the world’; and ‘sustained relationships – harmonious or conflictual’ (Wenger, 1998: 125-6); and the main process concerns the way ‘newcomers’ acquire established practices and knowledge. In ‘communities of learning’ there is greater emphasis on collaborative ‘creating’ rather than just ‘acquiring’ practices (Wenger, 1998) yet we refer not only to ‘learning’ but also to teaching and ‘structures of pedagogy’ (Adler, 1996). Thus we use the term ‘communities of inquiry’ [used by Wells 1996 in relation to classroom teaching and learning] to
mean communities that employ systematic strategies such as evidence based practices to make explicit, develop and challenge tacit ways of working.

The mechanisms through which elements of one practice are transferred into another context involve ‘mediating’ (Osborn et al., 1997) and necessitate an active ‘betweenness’ in engaging with tensions. Wenger (1998) identifies two types of ‘betweenness’: ‘peripherality’ and ‘marginality’. Certain mediating practices may be negative and so ‘marginalise’ some members from full participation. One coordinator, for example, identified the cascade training process as ‘marginalising’: ‘this must be the only profession where they don’t call in the ‘experts’ for training’. More positively, some practices offer the ‘peripherality’ of a different way of seeing and in this may lie the potential for movement from ‘acquiring’ to ‘inquiring’: ‘the NNS gears you as a coordinator to know where your school is going, where it is at and where to lead it to’. Peripherality ‘requires identities that can play with participation and non-participation’ in community practices (Wenger, 1998: 216).

**Coordinating the NNS: innovation, evidence and auditing**

The NNS itself can be seen as a ‘boundary object’, an artefact ‘around which communities of practice can organize their interconnections’ (Wenger, 1998: 105). In the same way teachers can be seen as ‘boundary agents’ mediating the use of such artefacts (Engestrom, 1996). One proposed model is that of ‘the evidence-based’ (Hargreaves, 1996, 1999; TTA, 1996, 1999) or ‘evidence-informed’ (Sebba, 1999) teacher. What might count as evidence, however, and whether this can fully suffice to ground professionality and practices remains controversial (Hammersley, 1997; Davies, 1999; Southworth, 2000; Pirrie, 2001). The NNS claim that its own grounding is in evidence from ‘the world’s knowledge bases’ (DfEE, 1999b: 1) is also contested (Brown, 1998). In contrast to such academic concerns teachers’ initial engagements with the NNS have been shown to be largely positive (Earl et al, 2000, 2001). However, this positive mediation seems to draw on justifications or ‘warrants’ from a variety of registers, both performance and ecological, and not just that of ‘evidence-based practice’ (McNamara & Corbin, 2001).

In the primary school context, practices involving the gathering, analysis and use of certain kinds of ‘audit’ data are increasing (Webb & Vulliamy, 1995). ‘Performance Management’ procedures and ‘Threshold’ career scales are recent additions, and also involve the collection of certain kinds of ‘evidence’. Additionally, most teachers now coordinate some curriculum area, which has entailed an increase in the demands of their role. Our own earlier research (ERSC R000222756) found the prospect of ‘cascading’ the NNS and greater involvement in monitoring caused particular anxiety to most of the primary coordinators. The ‘cascade’ model of implementation was, on early evaluation, found to be a ‘fragile’ one (Earl et al., 2000), especially given the limited training available for specific teachers, and the need for longer-term support (Ofsted, 2000). The questions that remain are: how do coordinators mediate the NNS in the context of audit practices beyond the initial cascading phase and in what sense is this evidence-based?
OBJECTIVES

1. To identify and analyse the different ways (formal and informal) in which teachers’ mathematical pedagogical knowledge is developed, used, shared, evaluated and revised as the National Numeracy Strategy is implemented by teachers with a variety of backgrounds and experiences. This objective is reported in the ‘communities of practice’ section in relation to ‘managing subject and pedagogy’ and ‘managing people’ and later in ‘communities of inquiry’ section.

2. To explore how teachers develop and deploy different registers of ‘professional’ language in warranting their practice, defending tradition and addressing innovation. This objective is reported throughout the results section and especially in terms of the registers used in particular contexts [Quotations from teachers are italicised throughout].

3. To examine how structural and cultural factors relate to the development of effective ‘communities of practice’ amongst groups of practitioners within schools. The focus here is on management practices, which is reported in the section on ‘communities of practice’.

4. To explore the nature of interventions which may assist further development of these groups into ‘communities of inquiry’. This is reported in the ‘communities of inquiry’ section, including Vignette 2, but the impact of certain kinds of audit practice in the systematic collection, analysis and use of data, are also relevant.

5. To look at the ways in which the National Numeracy Strategy and notions of evidence-based become embedded in professional practice over time, and explore their effect on the development of notions of professionalism. This is reported at various points through the results section, especially in relation to the tension of ‘accountability’ as imposed and self-regulated and the ways teachers warrant their practices. A particular example is detailed in Vignette 1.

METHODS

The study was based upon a small group of 6 urban primary schools in an area of high social and economic deprivation across Manchester and Salford LEAs. The group had been involved in a previous project (ESRC R000222756) of 12-month duration that anticipated the NNS by 1 year. In this follow up study 2 schools, keen to continue their involvement at the time of the grant application, requested to withdraw because of staffing problems. Two further schools were invited to participate – one of which was subsequently identified as ‘at risk’ and it was thought better that it withdrew. The study focused directly upon a group of 2 ‘key’ teachers as change agents within each school: the coordinator and another teacher, often teaching in the other key stage. Such was the staff turnover that only 5 of the 12 key teachers from the previous project were involved in the follow up study. The key teachers (all female) attended one half-day Research and Development (R & D) Group session each half term. The sessions were led by a numeracy consultant and aimed at supporting coordinators in developing curriculum content/methods and understandings within their school.
The data collection process involved teachers in recording (video/audio) aspects of their personal practice and paired work discussions in the school-based context. Individual data sets also contained documented aspects of coordinators work, such as evaluations of teacher lessons, and school numeracy development timelines. The evidence-base in total comprised: 4 sets of interviews with key teachers (individually, then as pairs), including observation notes from R & D sessions; recorded data from their own or partner’s classroom practice; tape recordings of discussions between key teachers and others; and interviews with Headteachers. The variation in data collection techniques provided a basis for triangulation including: multiple sources - senior management and key teachers’ accounts of events; tracking change in teacher perceptions over time; and multiple methods – self reporting, video/audio tape etc.

The categorisation and analysis of data was initially focused on ideas that evolved from our first study, as outlined in the grant application. With regard to the notion of warranting, for example, we found that key teachers invoked a range of appeals to justify their personal practice from the individual ‘it works for me’ to the public ‘we do it because it’s a country-wide thing’. The term ‘warrant’ captured, for us, a sense of both personal authentication and external legitimation. The personal warrants were impacted upon by subsequent data analysis from the current study relating to how teachers as coordinators worked with others, and a framework was developed for warrants spanning performance ‘audit-based’ and ecological ‘collegial-based’ registers. Though these are contrasting, our analysis also sees them as mutually interfering and in a state of flux, across contexts and purposes and understood differently on cognitive and affective levels (McNamara & Corbin, 2001).

RESULTS

The study aimed to understand if, and how, the immediate and potentially superficial change brought about through the implementation of the NNS became more deeply embedded in pedagogical practice. Examining such change the study sought to identify cultural processes in the school that influenced the contextualisation and interpretation of the NNS within local communities of teacher practice and the mechanisms that facilitated the growth and sharing of their mathematical knowledge. Further, it evaluated the factors that facilitated/impeded their possible development into ‘communities of inquiry’. Our results are accessed via the accounts of ‘key’ teachers and reported in two main sections: ‘communities of practice’ and ‘communities of inquiry’. It is important to note that what we report is largely how coordinators currently account for their practices to each other and ourselves. To briefly convey something of our focus on process, situated mediation and discourse, we also use the vignette form (Miles 1990).

Coordinating in communities of practice

Managing resources

Resource management, once a central function of the coordinator’s role became, during the period of the study, both diminished in comparison to the other areas and more integrated with analysis of whole school audit. ‘I like the [coordinator role] it gives you the chance to see the whole picture rather than just “well here’s a catalogue”, buy some things and tidy up’. As a discrete practice it was recontextualised as part of a larger process and in this sense it became more evidence-based, identifying areas of ‘weakness’ in order to better target resources: ‘We
usually analyse the SATs results question by question to see the patterns … And then I direct all the resources that I can purchase towards that area of learning’ (Karen, School C).

Managing resources became part of a more complex community relationship as illustrated by the following account of ‘a shift at the moment in our school’:

I think [Headteacher] is trying to make sure mathematics is resourced properly, and if every single coordinator does that, then the teacher will have an easier job. So you are accountable for a budget and… teachers feel they have a right, not to blame you, but to say “Can you make sure we get it because I can’t teach properly?” So it’s turned it around… If I’m given responsibility, I take it very seriously. But at the end of the day we’re colleagues. We have half-term evaluations from every teacher for our subject…to feed into our development plan. … Everybody has to be fairly diplomatic (and) you hope people will be fair (Paula, School B)

The attempt to ‘turn it around’ is mediated in two ways: ‘accountability’ as ‘blame’ is warranted as a ‘right [to] … teach properly’; and accountability as ‘performance’ (‘budgets’, evaluations’ and ‘development plans’) is warranted ecologically as a collegial responsibility to be ‘fair’ and ‘diplomatic’. Paula’s account rehearses a challenging encounter with a colleague and as a general point we were struck by the frequent use of direct speech in the ‘ecological’ register that often revealed the routine immediacy of the classroom but was also used to revive or rehearse significant moments.

Managing subject and pedagogy
Subject expertise is a source of tension in coordinating (Millet, 1998) and there were indications that it was becoming an increasingly important consideration in both the role and the appointment of maths coordinators. Historically the role of coordinator in the project schools had not been assigned with subject expertise as an essential criterion, however, this was clearly a factor in the appointment of the two most recent coordinators who were mathematics graduates. An increasingly important warrant for the numeracy coordinator was thus subject expertise; yet this was both a resource and a potential barrier to ‘collegiality’. The coordinators’ own experience, as recipient of ‘expert’ consultancy, both inspired and intimidated them; and they in turn were very sensitive to management of ‘co-learner’ and ‘expert’ identities with their colleagues: ‘After watching other [teachers’] lessons I think “God I don’t do that!” … In my next lesson I did and you’re always learning’. (Wendy, maths graduate, School D). As with non-graduates such learning at times transferred into subject consultancy work: ‘I was observing a lesson and I remember thinking “That’s such an obvious thing to do!” and walked out and told everyone else (Paula, non-maths graduate, School B).

For the non-maths graduate coordinator, being somewhat marginalised from subject expertise may even be claimed as a pedagogic resource: a ‘peripherality’ of empathy with pupils, ‘I think it helps to teach maths, the fact that you’ve struggled’, and with colleagues, ‘I said “Right we are doing this together, this is not me pouring it down you”’ (Phoebe, School A).

Again the use of direct speech in the ecological register, emphasising affective impact as well as cognitive import, is evident in these quotations.

All coordinators, however, given their extra numeracy training (initially from the three-day training event) and subsequent project activities, did see their relative expertise in mathematical pedagogical knowledge as a resource. In this the Framework (DfEE, 1999a) itself was especially well received, as its emphases were seen to combine a new clarity of focus and yet speak to an existing ecological register of pupil ‘understanding’. It also seemed to mediate
positively between national prescription and local judgement, ‘teachers love knowing that there is a framework but are given freedom, that it’s up to us how we do it’ (Phoebe, School A); and between external authority and continuity of self: ‘I think because it’s national, and a strategy, it gives you a bit more confidence in things you believed in before… more clout’ (Helen, School E).

Prior to the official national implementation of the NNS, the key teachers had anticipated ‘cascading’ and subsequent classroom ‘monitoring’ as considerable challenges: ‘who am I to go in and tell someone else that they are doing it wrong?’ In the event, they felt satisfied with the quality of the three-day training they had received, given its limited brief as an introduction to the larger developmental process of embedding ‘massive change’ (Headteacher, School B), dealing with ‘a frame of mind’ (Phoebe, School A). On this basis, they were reasonably satisfied with their own initial ‘cascading’ to staff in their schools. However, doubts about ‘cascading’ as more than information-giving were renewed: ‘this cascading theory or whatever they are calling it … goes wrong, because the people who go on courses do get that extra bit, they understand why, rather than just doing’ (Sara, School B). Embedding was seen as something more deeply connected with understanding, which required a more sustained process of monitoring and support.

In regard to subject and pedagogic expertise, however, there seemed overall an uncertain weighing up of technical gains in mathematical pedagogical knowledge as against a loss of ‘ownership’ and pervasive sense of inadequacy in measuring up to an ideal:

In all my naivety in the past, I’m sure my maths lessons are better…It’s a feeling of ownership…because in the past if I came up with a good lesson it was mine. And now it’s a feeling, that there’ll always be something better… At which point do you actually feel “Gosh, you know, that was really good!”? (Paula School B)

Another coordinator even surmised that subject expertise demands might lead to ‘key stage’ rather than ‘whole school’ coordinating.

Managing data

Audit practices included data gathering and analysis, and engendered similar ambivalence: ‘target-setting wasn’t really what I wanted to do, but now as coordinator, it’s the only way to see true progression’. At the same time it was felt that such measures could be ‘soul-destroying’, and on their own ‘not a true reflection of what the school is actually doing, the value that [we’re] giving to pupils’ (Karen School C). School C, in an area of high pupil mobility, began to ‘track’ ‘stable’ pupils in order to construct their own evidence-base which would provide a ‘true reflection’ of the ‘value added provided by the school’.

A major challenge for all coordinators was to link such data-based evidence with classroom support. One way schools dealt with this was to integrate subject managing into whole-school processes of data monitoring that involved the performance register. Yet such communal analysis raised tensions for coordinators in dealing with identified weaknesses:

We’re going through our SATs analysis, at our staff meeting, our areas of weaknesses. Now I’m going to compare them with the years before, whether it’s the same areas, and times of the year, to track that back through all the different Year groups, so that everyone, not just Year 6 is responsible, it’s the whole school’s responsibility (Wendy, School D).

Wendy mediated this ‘development-supervisory’ tension in two ways. The first was to address the problem in its own terms, as statistical trend data about ‘which’ and ‘when’ rather than ‘who’. The second was to turn the ‘who’ of individual accountability (the Year 6 teacher) into
collective ‘responsibility’ not blame. In another school, with a long established coordinating team, ‘supervisory’ practices of managing data were made a development topic: ‘we have always done training as a whole school...[but] it’s in analysis now’, especially of whole group or year data as an evidence-base about ‘where the gaps are’ (Helen, School E).

**Managing people**

The NNS, as an external intervention, complicated the process whereby ‘newcomers’ characteristically acquire the practices of ‘oldtimers’ in ‘communities of practice’ (Lave & Wenger, 1991). Teachers reported feeling simultaneously ‘oldtimers’ and ‘newcomers’ and less experienced coordinators particularly felt ‘intimidated’ by the task of acting as ‘change agent’ in relation to more experienced colleagues. Four factors ameliorated this situation: the rate of change meant that ‘everyone felt only one step off everyone else’; the NNS was felt by all to have ‘merit’ for their own practice and ‘worth’ from colleagues’ points of view (Askew et al, 1993); nearly all teachers were coordinators in some subject area and thus older notions of ‘collegiality’ were extended into such activities; and, the audit-driven improvement culture invested coordinators with greater authority.

Linking whole school data with individual support remained a challenge that required skilled ‘people-management’. One prerequisite for this was effective relations with senior management. Heads, in particular, were seen as crucially important in the further embedding of the NNS, especially in sustaining it in the context of later innovations: ‘If it had been me, one lone voice, I don’t think I would have achieved as much’ (Holly, School E). In general, what was valued included: authoritative backing; access to staff meeting agendas when specific issues arose; and integration of the NNS into whole-school planning. For example, one coordinator rehearsed a warrant she might need to invoke: The head said go in there and say ‘You’ve nodded and agreed with me to do them [actions from school plan] ... we have to have uniformity and it has to be happening (Paula, School B). Supervisory practice was warranted in terms of not just externally imposed change, but ecologically (‘you’ve nodded and agreed’) as community development.

The two schools whose coordinators were also members of the Senior Management Team (SMT) were the least ambivalent about seeing audit-based planning as a resource for professional collaboration. For example, in the evaluation cycle in School D, all teachers came to observe the coordinator, including the head and deputy, and then all three observed all the other teachers, giving advice and negotiating an objective for ‘improvement’.

Where marginality from management was most strongly experienced, professionality remained more a matter of ‘self’, defined against ‘others’ as managers. In School A, for example, the coordinators rejected the register they were expected to use, ‘a management pattern... “I really like this and this, but do you not think...?”’, and sought instead a collaborative dialogue, ‘a genuine response’ (Jean, School A). ‘Supervision’ remained an SMT practice and one which was at times regarded negatively: ‘You don’t need somebody with a clipboard sitting there telling you you’ve done it wrong.’ Where relations with SMT were weaker the warrant for working with others fell, in a period of rapid change, more heavily onto the NNS itself: ‘with so many new things you feel you’re just drowned, I just cling onto the Numeracy’. It was a resource for sustaining ‘non-threatening’ professional relations.

Where non-SMT coordinators felt better supported by management in audit practices professional identity in the context of classroom support seemed problematic in other ways as illustrated in the vignette below.
Vignette 1 (School C)

Susan the new externally appointed headteacher provided what Karen, the new internally appointed coordinator, called ‘incredibly strong leadership’. Karen wanted to coordinate as a ‘critical friend’ and felt ‘intimidated’ at the prospect of being a ‘change-agent’, yet agreed that rapid change was needed, given the school’s low National Test results and ‘intensive (LEA) support’ status. A number of warrants seem to have helped her mediate these tensions. First, she had been coached by an LEA advisor in classroom monitoring and came to feel ‘my opinion was pretty much the same [as the advisor’s], so I think I kind of trust my own judgement now’. Two versions of accountability, externally imposed and self-regulated, had been reconciled. Second, she had designed a targeted observation sheet that she warranted both as evidence-based, upon audit data, and as collegially ‘shared’ in its implementation: ‘You target certain things and say: “I’m looking at…” and give them a sheet. You share it… and that helps because when you’re feeding back to them, they can tell you “I this or that”…you don’t need to tell them’.

Third, she felt that her colleagues were increasingly becoming self-regulating, warranting their own practice, which meant that she was not undermining their professionality: ‘there’s no convincing [by me] going on…I think as people are finding out “Yeah I can do that now!” and that it is actually improving standards, they’ve convinced generally themselves’.

Fourth, she had developed the ‘peripherality’ of a productively different perspective of the implementation of the NNS within her community of practice: ‘The more I do it [observing others] the greater understanding I have of the whole system… rather than just have snippets of my own year group’. She felt her particular overview now warranted her in advising even more experienced colleagues on continuity and progression.

Coordinators identified ‘getting into classes’ as an aspect of their newer professionality. In all but one school (School A) they saw this as involving both development and supervision: ‘a balanced approach’. They evolved different ways of handling the tensions that this involved. In School D, for example, the coordinator first used the same discursive pattern that the coordinators in School A had rejected: ‘first three good things’, then three ‘bad’. But she saw it not as School A had, from a management register, but from a pedagogic one as in a NNS pupil review. As her confidence grew, she developed another observation/feedback process to supervise and support: first she was a ‘fly-on-the-wall’ seeing ‘as objectively as possible’, and then she adopted a more collegial style to discuss the session and negotiate specific targets.

Another approach to ‘objectivity’ was to require evidence: ‘if you do have to give someone bad information you must back it up with facts’ (Sara, School B). Another key teacher invoked the process of triangulation she also drew on ‘performance management’ advice about classroom observation as a supportive peripherality: ‘just a different set of eyes looking from a different angle and feeding back what you see’ (Paula, School B). Yet she still spoke of experiencing tensions when she could not reconcile two possible perspectives upon a lesson she had observed: ‘brilliant maths content’ but would an Ofsted inspector, as ‘stranger’, see its structure as that of the NNS. She prioritised the ‘supervisory’ relation to make sure ‘nobody failed a lesson’ in the forthcoming inspection.
Coordinating in communities of inquiry

We take ‘communities of inquiry’ as ones that employ systematic strategies such as evidence-based practices to make explicit, develop and challenge tacit ways of working. This refers to particular moments and opportunities for inquiry within ongoing communities of practice and it has some similarities with Hargreaves’s (1999) notion of the ‘seeds’ of such inquiry in a ‘knowledge creating school’.

Our own project intervention aimed to foster alternative development of NNS activities, such as the strategic focus on ‘questioning’ negotiated in our R & D group for more demanding inquiry-based and problem-solving work. This itself seemed to link with an ecological concern to ‘make the children’s minds go deeper’ (Helen, School E). More generally, ‘questioning’ was seen as helpful because it was a focus particularly to find ways to enable pupils to move on from responses such as ‘I just knew it’ (Holly, School E) and to explain their thinking more fully. The two key teachers from each school worked in pairs during these R&D sessions, discussing and trialling activities that might be used with colleagues. Some of the sessions also provided opportunities for sharing of experiences and strategies for coordinating. The sessions also provoked reflexivity about personal practice and pupil experiences, some of which was felt to be quite challenging: ‘I hadn’t a clue what to do … I’m sure the children feel the same’ (Louise, School C). However, the main purpose was for initial pair-work as a ‘seed’ for co-inquiry and a basis for further work with others as depicted in Vignette 2.

Vignette 2 (School B)

Sara was maths coordinator, and a Stage 1 teacher. Paula through her involvement in the project gradually became an ‘unofficial’ Stage 2 coordinator. As a pair they tried out several R & D activities on problem-solving, and tape recorded their planning for these. A collegial register was evident throughout, with most interchanges reflecting each other’s terms, inviting comment and mutual inquiry: ‘I don’t know if you agree’; ‘Would you go as far back as…?’ Having established a rapport Paula’s pedagogic agenda was for the activity ‘to be children-led’ and she drew upon Sara’s specialist grounding (as a mathematics graduate). This involved basic issues about extending non-intervention time, and planning for pupils to work with materials, before raising the level of problem-solving difficulty. In interview, they both felt that such ‘in-depth planning’, though unrealistic in terms of time for routine use, helped them realise just how demanding of pupils such activities were.

Paula videoed a subsequent lesson about the use of ‘writing frames’ to help pupils record their thinking about the moves they made in such activities. Viewing these enabled her to stand back from the immediate classroom interaction and attend more to pupil thinking. She was very concerned that the focus on questioning did not reduce to just filling in ‘the question box on planning’, as a mere ‘crutch’ for audit accountability, rather than even just one ‘really good, nitty-gritty question that gets right down to their understanding’. She also tried to observe pupil activity more in her own routine classroom work, planning questions to enable her observe how pupils coped. She then tried to encourage something of this when observing teachers: ‘I was saying “Let them sit for ten minutes and be uncomfortable about the activity”’. At the same time, she feared this desire for ‘the children to be thinkers’ might be ‘a contradiction’ with inspection: ‘An external assessor might turn around and say, “You should be there now, prompting and pushing”’. Paula and Sara found such co-inquiry work ‘too fine a skill’ for hard-pressed
In School A, the coordinators worked on a smaller scale. They observed each other’s classes and discussed videotapes of groups of their pupils working on some of the R & D investigative work. The impact of this was limited, given what they experienced as a marginalisation from monitoring practices. But it was felt colleagues, in all sections of the lesson and ‘in so many different ways’, would now ‘ask more open-type questions without being so worried about it’ (Phoebe, School A). In School C the key teachers tried the R & D work in their own classrooms, discussed the outcomes, and decided to trial them in all years, modifying the problem-solving activities appropriately. They then evaluated this on the basis of feedback from staff. School E, staff made ‘questioning’ a focus across all subject areas, to be ‘pulled together’ by the school development plan: ‘questioning is like the axle… holding the machinery together… we would have more resistance… if they couldn’t see a real purpose for questions’. This is a professionality warranting itself by an appeal to a community of coherent practices; a sense that audit, NNS innovation, School Development Planning and Performance Management are ‘pulled together’.

We have already described some moments when the practices of the NNS, as a complex external innovation, was actively mediated in schools rather than merely ‘acquired’ and there were occasions when this bordered upon an ‘inquiry discourse’. Likewise audit practices more generally have informed a new community of inquiry with its professional discourse of monitoring, targeting, tracking etc., though its effects on coordinator practice has mainly been to monitor compliance with basic NNS recommendations as contextualised in school-wide planning. Routinely sustaining such activities as co-teaching, planning and evaluating was experienced by key teachers as valuable but extremely time-consuming and the wider impact of such activities largely depended on the extent of their incorporation into whole-school accountability practices.

The tensions remain active in these coordinators’ accounts and suggest unitary notions of ‘the’ coordinator underestimate the importance of variation in induction processes, subject expertise and management and collegial cultures.

**Outputs (see attached forms)**

**Impacts and Activities (see also attached form)**

1. Engagement of staff in 5 urban schools in socio-economically deprived areas of Manchester and Salford with research activities that have a focus on numeracy and evidence-based practice.

2. Engagement of head teacher representatives on steering group together with LEA school improvement officers.

3. Collaboration of LEA and HEI personnel in research-focused activities.

**Future research priorities**

Dr McNamara is in the process of submitting a bid to the ESRC with a focus upon pedagogical subject knowledge in science and evidence-based practice.
REFERENCES


**Report Authors:**

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