Research Brief

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Effective Primary Pedagogical Strategies in English and Mathematics in Key Stage 2: A study of Year 5 classroom practice drawn from the EPPSE 3-16 longitudinal study

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Introduction

The Effective Provision of Pre-School, Primary and Secondary Education (EPPSE 3-16) project is a large scale, longitudinal, mixed-method research study that has followed the progress of 3000+ children since 1997 from the age of 3 to 16 years. Previous EPPSE analysis identified significant variation in teachers' classroom practice and pupils' behaviour in Year 5 classes and that this predicts children's later achievement.

This research explored the differences between poor, average and excellent teachers, through observation of teaching practice and linking this to the effectiveness of schools. This involved additional analysis of observations in 82 year 5 classrooms which were originally observed during the Spring and Summer terms of 2004 and 2005.

Key Findings

There are significant differences in the strategies used by teachers in excellent, good and poor schools. There is a 'bundle' of behaviours that, taken together, can make a difference to children's development and progress and therefore their later life chances.

Year 5 teachers in excellent schools (defined as those which are academically effective with good quality pedagogy):

- **Have organisational skills**: teachers share clear learning objectives with their pupils, ensure all pupils understand the objectives and associated concepts, have extremely well-organised resources and well-established classroom routines.

- **Establish a positive classroom climate**: relationships between children and between adults and children are characterised by a sense of liking and mutual respect, classrooms are happy places, children are less disruptive and behaviour management is handled sensitively.

- **Personalise their teaching**: teachers are sensitive to the needs and interests of their pupils, provide a variety of resources to suit the individuals in their classes, are more likely

to make explicit the links between learning in the classroom and the world outside the classroom and provide homework directly linked to what children are learning in their lessons.

- **Use dialogic teaching and learning**[1]. Children work collaboratively, take part in instructional conversations in Literacy, have opportunities to receive evaluative feedback and spend more time learning and performing analysis. In Maths, these teachers use analysis and maths discourse, share maths 'authority'[2] with the children and their pupils have greater depth of knowledge and understanding.

- **Make more frequent and better use of the plenary**: teachers in the best schools are about twice as likely as teachers in poor schools to use a plenary and they use it to provide feedback and to allow further discussion, exploration and extension.

Effective Primary Pedagogical Strategies in English and Maths in Key Stage 2

Background

The Effective Provision of Pre-School, Primary and Secondary Education (EPPSE 3-16) project is a large scale, longitudinal, mixed-method research study that has followed the progress of 3000+ children since 1997 from the age of 3 to 16+ years.

A continuing question for EPPSE was whether pre- and primary school experiences or children's early home learning environment (HLE) could reduce inequality. While the original studies found that parents' socio-economic status (SES) and qualifications were significantly related to child outcomes, they also found that the quality of the early HLE was important (Melhuish et al., 2008; Sammons et al, 2004). Also important, and particularly relevant to this study, was the extent to which educational influences (pre-school and primary school quality and effectiveness) also shaped children's educational outcomes. These reports were published as 'Variations in Teacher and Pupil Behaviours in Year 5 Classrooms' (Sammons et al, 2006) and 'The Influences of Teaching Quality on Children's Progress in Primary School' (Sammons et al., 2008).

This earlier research found that *overall teaching quality* is a significant predictor of better cognitive progress for children, and specific aspects of classroom processes were found to predict both better cognitive progress and social/behavioural development. For example, higher levels of disorganisation were related to poorer progress in Reading and Mathematics and increased hyperactivity and quality of pedagogy showed a strong relationship with children's progress in Mathematics (Sammons et al., 2008).

Since educational influences are mainly exerted through teaching, this suggested that an in-depth evaluation of the pedagogical strategies used in the schools involved would be of both policy and practitioner interest. This study provides greater insights into effective primary pedagogical strategies in English and Maths.

Pedagogy is a contentious term (see Ko & Sammons, 2010). Our definition is:

> *Instructional techniques and strategies which enable learning to take place. It refers to the interactive process between teacher/practitioner and learner, and it is also applied to include the provision of some aspects of the learning*

[1] "Dialogic teaching is an approach to teaching which in a highly disciplined fashion harnesses the power of talk to stimulate and extend pupils' thinking and advance their learning and understanding" (Alexander, 2011, http://www.robinalexander.org.uk/dialogicteaching.htm)

[2] Sharing maths authority means that the children, and not just the teacher, can be the leaders and experts on maths questions and concepts.

environment (including the concrete learning environment, and the actions of the family and community). (Siraj-Blatchford et al., 2002)

Effectiveness is another controversial term. In educational effectiveness research the focus is on the teacher or school's contribution to pupil progress (Teddlie and Reynolds, 2000) Melhuish et al (2006:4) argued that:

> *Primary schools where children make significantly greater progress than predicted on the basis of prior attainment and intake characteristics can be viewed as more effective (positive outliers in value added terms). Primary schools where children make less progress than predicted can be viewed as less effective (negative outliers in value added terms).*

This study explores the associations between value added measures of school effectiveness and variations in pedagogy.

Methodology

During the primary phase (EPPE 3-11) of the longitudinal study the research team conducted contextualised, value-added analyses for all primary schools in England across three years (2002 – 2004) from Key Stage 1 to Key Stage 2 (Melhuish et al, 2006). These analyses, based on multi-level modelling, considered children's progress and attainment while controlling for a range of background factors (e.g. gender).

As part of this, 125 primary schools, drawn from the 850 schools in the study, were selected for further study. The schools identified had a range of academically effective outcomes, including those with high, medium and low effectiveness scores, covered a range of contexts (inner city, shire and rural) and had at least four EPPE children on roll. Standardised assessments were used to measure the children's cognitive attainment in Reading and Mathematics and teachers completed profiles on their children's social/behavioural development. During field visits during the Spring and Summer terms of 2004 and 2005, researchers collected information about classroom practices and processes through classroom observations. They used two observational instruments: the Classroom Observation System for Fifth Grade (COS-5, NICHD, 2001) and the Instructional Environment Observation Scale (IEO, Stipek, 1999). Of the original sample, 82 primary schools with full data sets were included in this analysis.

Strict criteria were applied to identify three distinct groups of 'ideal type' schools: academically effective schools with good quality pedagogy (10 excellent schools), schools with medium academic effectiveness and medium quality pedagogy (9 good schools) and those with low academic effectiveness and poor quality pedagogy (10 poor schools). The remaining schools fell in-between/around these categories (apart from a small number [8 schools] that did not fit clearly into any category and were excluded). Each 'ideal type' group contained schools from a variety of settings (inner city, shire and rural) and had a range of levels of advantage of pupil intake (i.e. schools with higher and lower percentages of pupils eligible for free school meals [FSM]).

In order to develop the analytical framework of pedagogical strategies, professional focus group discussions, with a professor of education, the headteacher of a large primary school and a teacher were combined with a literature search to identify factors that contribute to effective classroom practice. An initial 40 strategies/factors (many with similar features) were collapsed into 11 main strategies.

Findings for each of the Pedagogical Strategies

1. Organisation

Teachers in excellent and good schools were rated highly on their organisational skills and wasted no time. The classroom routines were efficient and smooth. Children were responsible for their own time and resources: they knew what to do and they did it.

Teachers in excellent schools were rated exceptionally highly. Their resources were prepared ahead of time, well-managed during lessons, were particularly fit-for-purpose and tailored to the individual needs of their pupils. They made productive use of instructional time by maintaining good pace and by ensuring that every second of their lessons counted. Pupils in these classes had the highest ratings of self-reliance.

Year 5 classrooms in poor schools were rated significantly lower than the other groups on how well the teacher's resources were organised and how fit for purpose they were, how productively instructional time was used, the clarity of the teacher's expectations, including classroom routines, and the children's independence and self-reliance. Lessons were slow to start, pace was not maintained and time was wasted during transitions. Pupils in these classes received the lowest ratings of self-reliance.

2. Shared objectives

Teachers in excellent and good schools ensured that the concepts and ideas presented in lessons were understood by all children. They checked that children understood the main ideas of the lesson, intervened when understanding was not clear or complete and did this even when it meant changing the lesson or activity part way through.

Although most teachers were good at making sure the learning intentions of each lesson and activity were clear to the children (for example, by writing lesson objectives on the board), teachers in excellent schools were especially good at this. Pupils in these classes were very clear about what they were expected to achieve and how much time they had to do it in.

In contrast, objectives and learning concepts and ideas were less clear in poor schools. Teachers were slow to check, and to correct where necessary, their pupils' understanding of key concepts and ideas. Although children in these classrooms were aware of their lesson objectives, it was not clear whether or not they fully understood them or how to achieve them and there was much less focus and drive to meet these goals.

3. Homework

Although the use of homework was not systematically recorded when classes were observed, the researchers captured some data on this area. Teachers in excellent and good schools appeared to set homework that was more meaningful and more directly linked to what the children were learning. They had a more flexible approach to setting work to be completed outside of class time and this was sometimes in addition to the timetabled requirements. For example, they were more likely to make use of spontaneous learning opportunities that arose within lessons (e.g. asking the children to write the next paragraph of a story being written collaboratively by the whole class) that would allow children to extend and deepen their understanding of classroom learning.

In poor schools, teachers set homework simply because they were required to set it and the work itself did not appear to be expressly linked to what the children were learning in class. There were no examples of teachers using opportunities that arose during a lesson to set different/more homework than what was already planned.

4. Classroom climate

Classroom climate, the overall feeling in the classroom characterised by teacher-pupil and pupil-pupil relationships, was rated highly in excellent and good schools. Classrooms in

excellent schools were rated exceptionally highly on positive classroom climate. Children were well-liked and respected by their peers and ratings of negative classroom climate were, as expected, very low.

The overall classroom climate in poor schools was often rated as unpleasant. Teachers were more likely to display negativity (disapproval, reprimands, expression of teacher's dislike, etc) and children in poor schools were less sociable and less cooperative than those in other schools.

5. Behaviour management

The differences between the three groups were evident when considering the management of behaviour. Children in excellent and good schools were less disruptive and rarely needed to be disciplined. Where teachers did need to correct behaviour, they used humour or a quiet reminder.

Although levels of indiscipline were also generally low in poor schools, children in these schools were more disruptive and teachers disciplined them more frequently. Discipline was often public and sometimes involved threats, personal attacks, shaming or belittling children. Levels of chaos and teacher over-control (rigid approaches designed to meet teacher's rather than children's needs) were significantly higher in poor schools.

6. Collaborative learning

Children in excellent schools spent the most time overall in collaborative learning situations (although the differences in the amounts of time children in different groups of schools spent in collaborative learning settings were not significant).

7. Personalised teaching and learning

Teachers in excellent and good schools were more likely to personalise their pupils' learning experiences. They did this by being sensitive to the individual needs of the children in their classes and by providing learning materials that were rich and varied. They were rated as very low in teacher detachment (for example distancing themselves from their pupils by staying and working at their desks, not offering feedback, not noticing children's behaviour or needs) and high when providing social support for student learning in literacy.

Teachers in excellent schools were exceptionally sensitive to the needs of the children in their classes and provided outstanding learning materials specifically chosen and adapted for their pupils. The individual needs of the Year 5 children in these schools were met through their teachers' friendly approach, high expectations and appropriately challenging and differentiated tasks.

Teachers in poor schools provided teaching and learning resources that were less varied and engaging and less likely to be appropriately differentiated, were less sensitive to their pupils' individual needs and more detached from their learning experiences.

8. Making Links Explicit

On the whole there were few instances of teachers making extra and cross-curricular links explicit. Teachers in excellent schools were better able to and more consistent at making links to areas outside the specific lesson. Teachers in poor schools rarely connected their lessons and activities with other subjects or with areas outside the classroom or school.

9. Dialogic Teaching and Learning

The extent of dialogic teaching (Alexander 2011) showed few differences between the three groups, except in Numeracy where teachers in excellent schools received the highest ratings on using dialogic teaching and learning. Teachers in excellent and good schools were rated significantly higher on dialogic teaching (Alexander 2011) for their use of analysis in maths and in the depth of their pupils' knowledge and understanding. They were also rated more highly on

maths discussion and communication and on sharing the locus of Maths authority (Alexander 2011). In Literacy, they were rated higher on instructional conversations.

Children in poor schools spent less time learning and carrying out analysis, their teachers were less likely to encourage discussion, analysis and depth of understanding of mathematical concepts or to share the responsibility for learning with the children or to support and promote discussion for deeper understanding n literacy.

10. Assessment for Learning (AfL)
Teachers in excellent and good schools provided more evaluative feedback than those in poor schools. In addition, teachers in excellent schools provided greater opportunities for their pupils to reflect on their learning through review than teachers in both good and poor schools. Teachers in good and poor schools did not differ in the extent to which they provided opportunities for pupils to reflect on their learning through review.

11. Plenary
Although data on the use of plenaries had not been collected for all schools in the sample, teachers in excellent and good schools were found to have included plenaries in their lessons almost twice as often as those in poor schools. In addition, those in excellent schools were more likely to use the plenary to provide opportunities for further discussion, to explore issues in more depth and to extend work and concepts covered in the lesson. This finding extends that reported by Sammons et al, (2006) which revealed a statistically significant link between use of the plenary and independent measures of observed quality based on both the COS5 and IOE instruments.

In poor schools, a plenary session was often not included at the end of the lesson and when it was, was most likely to be an opportunity for children to check their answers rather than an opportunity to deepen understanding.

What differentiates best practice from good practice?

Year 5 teachers in excellent schools (defined as those which are academically effective with good quality pedagogy):

- Have excellent organisational skills. They share clear learning objectives with the children in their classes and ensure that all pupils understand these objectives and their associated concepts. Their resources are extremely well organised and fit for purpose and their classroom routines are well-established, smooth and followed by all. Children in these classrooms know what they have to do, what to do if they need help and have more responsibility for managing their time and resources.

- Establish a positive classroom climate. In these classrooms, relationships between children and between adults and children are characterised by a true sense of liking and mutual respect and are often described as happy places with a “buzz” of productive learning activity. Children in these classrooms are less disruptive, behaviour management is handled sensitively and often through expectation and teachers rarely have to discipline children. Teacher sensitivity is high and teacher detachment low.

- Personalise their teaching. These teachers are sensitive to the needs and interests of their pupils and provide a variety of resources to suit the different needs of the individual children in their classes. Learning objectives are clear and shared and these teachers are more likely to make explicit the links between the learning and activities in the classroom and other subjects and the world outside the classroom. These teachers link their homework directly to what children are learning in their lessons and are more likely to take advantage

of opportunities that arise during lessons to suggest learning activities that can take place out of class time.

- Use dialogic teaching and learning, especially for Numeracy. Children in their classrooms are more likely to work collaboratively, to take part in instructional conversations in Literacy, to have opportunities to receive evaluative feedback (from the teacher or from their peers) and they spend more time learning and performing analysis. In Maths, these teachers outperformed other in their use of Maths analysis, the depth of their pupils' knowledge and understanding, maths discourse and communication and their willingness to allow the children to also be the maths 'authority' in the classroom. The dialogue in these classrooms was genuinely two-way; teachers were open to pupils' suggestions and corrections and used these in their teaching.

- Made more frequent and better use of the plenary. Not only were these teachers about twice as likely to use a plenary in their lessons, they used the plenary to allow further discussion, exploration and extension, to provide opportunities for useful feedback and to consolidate and deepen understanding.

It is highly likely that good organisational skills, a positive classroom climate, personalised and highly interactive approaches to teaching and learning, dialogic teaching and learning and the use of a plenary session all interact with and reinforce each other. For example, dialogic teaching and learning would be impossible in settings with a negative classroom climate. Personalising children's learning requires good organisational skills and helps both to create a positive classroom climate and to encourage discussion.

Implications

Much has been written about pedagogy and effectiveness and messages (for both policy makers and practitioners) can be powerful when the two are studied together (Muijs and Reynolds 2011, Sylva et al., 2010; Ko and Sammons, 2010). What clearly emerges is a 'bundle' of behaviours that, taken together, can make a difference to children's development and progress and therefore their later life chances. This is especially true for those children who come from disadvantaged backgrounds, where previous EPPSE research (Sylva et al., 2010) has shown that what happens at classroom level in pre-schools and schools makes a difference to outcomes.

This research identifies a number of strategies which, if given a higher profile in the initial training and continuous professional development of teachers, would improve practice and therefore children's outcomes. These findings are of particular relevance to policy makers at both national and local level who have responsibility for investing in the staff development of teachers designed to improving their practice and ultimately children's life chances.

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Additional Information

The full report can be accessed at http://www.education.gov.uk/publications/ or from the EPPSE Website: http://eppe.ioe.ac.uk

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