RESEARCH

Effective Pre-school and Primary Education 3-11 Project (EPPE 3-11)

Summary Report: Variations in Teacher and Pupil Behaviours in Year 5 Classes

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CONTENTS

EXECUTIVE SUMMARY

The Effective Pre-school and Primary Education Project 3-11 (EPPE 3-11) is a large-scale longitudinal study of the impact of pre-school and primary school on children's developmental outcomes. The initial phase of the research followed children from pre-school to the end of Key Stage 1 (ages 3 to 7 years) and demonstrated the positive impact of pre-school (Sylva et al., 2004). The second phase investigates the development of the same group of children across Key Stage 2 (KS2) of primary education (7 to 11 years) and consists of three "Tiers". Tier 1 involves the analysis of primary school effectiveness across all primary schools in England using value added approaches measuring pupil progress across Key Stage 2 in terms of national assessment outcomes (Melhuish et al., 2006). Tier 2 focuses on the academic and social/behavioural progress of around 2500 individual children in the original pre-school sample. Tier 3 investigates classroom practice during Key Stage 2 via a study of Year 5 classes using observations of teacher and pupil behaviour. It involves a sample of 125 schools and classes drawn from among the 850 plus schools in which the EPPE children were located and investigates the extent of variation in observed practice and pupil responses and the relationships between pupil progress and classroom/school factors.

This report summarises the main findings from Tier 3 of the first analyses of classroom processes, reported in detail in a longer paper (see Sammons et al., 2006). It presents results of the analysis and comparison of teacher's and children's behaviours in 125 primary school Year 5 classes during the Spring and Summer terms of 2004 and 2005 (Tier 3). The paper provides a description of the sample in terms of two observation instruments used to investigate teaching and learning. It explores the extent of variation between classes in different aspects of teachers' practice and in children's observed responses.

In addition, analyses exploring the associations between several measures of overall *school quality* and effectiveness, improvement, teaching and learning, and the classroom observation measures of teachers' behaviour and children's response are described. The quality indicators were matched from Ofsted inspection data and take the form of numeric rating scales based on inspectors' professional judgements. Further analyses that link classroom observations to value added indicators of *school effectiveness*, derived from the Tier 1 component of the research using national assessment data (Melhuish et al., 2006), are also described.

Detailed classroom observations were made using one (n=125 classes) or two (n=93 classes) different observation instruments originally developed in the US. Observations focussed on Literacy and Numeracy sessions but included some other curriculum activities. There was significant variation in observed patterns of child and teacher behaviour between different classes and schools in the sample. This short report uses measures from both instruments to investigate the links between particular aspects of classroom practice and the measures of school quality and effectiveness. The significant variation found in this study suggests that pupils in different classes can have quite different educational experiences in terms of richness of instruction, time spent in teaching/learning basic skills and in developing higher order skills of analysis, and classroom climate.

Overall, levels of student engagement were found to be relatively high, and classroom climate was generally positive. The extent of teacher 'Detachment' was fairly low. Taken together, observation evidence on the incidence of 'Disruptive' behaviour, 'Discipline' and

'Chaos' ratings suggest that in most Year 5 classes pupil behaviour was fairly good. In a relatively small minority, however, behaviour problems and disruption were more common. Generally only a small amount of time was observed where pupils were 'off task', defined as not engaged in the intended lesson activity. The level of 'off task' behaviour was lower than that reported in some earlier studies of classroom practice published in the 1980s. Unproductive behaviour, while not a major feature overall, was observed to be high in a small minority of classes. This suggests poor organisation of work and classes by some Year 5 teachers.

Taking the evidence from both observational instruments, these data suggest that more whole class than individual work occurs and that group work is relatively uncommon. The findings point to some change from earlier studies where individual work tended to be more common than whole class work. The incidence of group work in this study, though relatively low, was higher than in studies from the 1980s. Overall, the observations suggest that time spent in different forms of setting (e.g. whole class, individual etc.) is in accord with the typical pattern suggested by the National Literacy Strategy (NLS) and National Numeracy Strategy (NNS) for the daily lesson, with the exception of the use of the plenary session, which was found to be absent in around half of classes observed.

The absence of a plenary in around half of Literacy and Numeracy lessons observed is of some concern as this part of the lesson is intended to give opportunities for feedback and be reducing the opportunity to provide to consolidate learning by the class. By missing this part of the lesson some teachers may such consolidation. In particular, the use of more demanding higher order communication is typically more common in plenary and other whole class activities. The comparisons of observed practice in Literacy and Numeracy revealed a consistent pattern of significantly more positive scores (indicating better practice) in lessons where teachers adopted a plenary in both Literacy and Numeracy, while the lowest ratings were found for classes that did not use a plenary session in either subject. Overall around 28% of classes used a plenary in both the observed Literacy and Numeracy lessons, while around a quarter did not use a plenary in either. In half the classes a plenary was observed in one but not the other subject. Interestingly, the research indicates that Ofsted ratings of overall school effectiveness and improvement tended to be more favourable in schools where the researchers had observed a Literacy plenary session taking place.

Social disadvantage

It has long been known that level of social disadvantage in pupil intake is associated with poorer pupil attainment and poorer progress. There may be various explanations for such associations with school context, including greater challenges in pupil behaviour and attendance, lack of home support, lower teacher and parental expectations, the impact of poverty in terms of poorer housing and material circumstances, and difficulties in recruiting and retaining good staff in schools in disadvantaged contexts. It is likely that a combination of factors operate which in combination increase the risk of poor educational outcomes for vulnerable groups of children. The observational study reveals that pupil behaviour tends to be worse in schools where there are relatively more children eligible for free school meals (FSM), and also where the observed classroom climate is less favourable. Ofsted data also indicates a link between context and attendance. In addition, the current research indicates that observed teacher behaviour varies according to FSM context. It is found that on aspects such as 'Basic skills development', 'Depth of subject knowledge', 'Social support for learning in Mathematics', 'Pupil engagement' and 'Classroom routines' in Literacy, observed scores were lower in classes in more disadvantaged contexts. Overall, observed scores for 'Pedagogy' in Literacy and 'Subject

Development' for Numeracy tended to be lower in Year 5 primary classes in schools with high levels of FSM. It appears from the observations in Year 5 classes that the quality of teaching tends to be poorer in schools with higher levels of disadvantage, while the behavioural challenges in terms of pupil behaviour in class tend to be greater.

Inspection evidence on quality

The availability of recent inspection evidence for 102 of the 125 schools in the study enabled an analysis to be conducted of the links between Ofsted inspectors' judgements of school quality and observed practice in Year 5 classes. Classroom observation measures were matched with Ofsted judgements on 'School effectiveness' and also on 'Improvement since the last inspection', 'Leadership', quality of 'Teaching' and 'Learning' and inspectors' ratings of pupil outcomes (attendance, attitudes and behaviour). The results revealed significant, though moderate, positive associations with various measures of teacher and pupil behaviour and quality.

The results indicate that observed teacher practice in Year 5 classes tends to be "better" (rated more highly on the various components of the observation schedules) in some schools; those that are rated more positively in the professional judgements of inspectors. Ofsted judgements of effectiveness were correlated with higher observer ratings on 'Productive use of instructional time', pupil 'Self-reliance', 'Richness of instructional methods' and 'Positive classroom climate'. Positive correlations with ratings of school leadership also indicate that this is associated with better observed classroom practice. This supports the view that the ways in which overall school influences may affect classroom practice need to be studied further, particularly the way leadership may promote better teaching and learning and thus better outcomes for children. Overall the findings suggest that there are links between more global constructs of school effectiveness as defined by inspectors, and more specific aspects of classroom practice related to the quality of teaching identified through the two observation instruments used in this research. The classroom practice of teachers in more effective schools appears to be influenced directly or indirectly by the school.

Value added measures of effectiveness

Additional analyses explored the relationships between the measures of observed teacher and pupil behaviour in Year 5 classes and value added measures of overall school effectiveness from Tier 1 of the EPPE 3-11 study. These value added indicators were based on pupil progress across KS2 measured using matched national assessment data (Melhuish et al., 2006). A number of aspects of observed classroom practice were found to be significantly associated with the value added indicators of progress in Mathematics and English in Key Stage 2. Although only weak to moderate, such associations again point to links between overall school effectiveness and specific features of classroom practice and provide helpful insights into what features of more effective practice and pedagogical approaches may promote better pupil progress in Literacy and Numeracy across Key Stage 2.

At this stage the analyses point to important variations in pupils' classroom experiences in Year 5 and potentially interesting associations with disadvantage and some aspects of teaching quality, as measured by inspectors' judgements. The correspondence between Ofsted ratings of quality and value added indicators with the classroom level observations gives confidence in the extent to which the two different classroom observation instruments can identify important features of classroom practice in English primary schools. These analyses help improve understanding of the variation in school and classroom processes and provide insights into more effective practice and pedagogical

approaches. The information about the variation in teachers' behaviour and pupil response is relevant to policy makers concerned with the further development of the National Strategies and points to areas of possible weakness of the teaching in some classes that could benefit from further guidance and professional development. There are positive findings in many areas including classroom climate and the lower levels of time pupils spend 'off-task' compared with earlier research studies in the 1980s.

Key findings

Pedagogy

- The observational research identified significant variation in both teachers' classroom practice and pupils' behaviour in class and distinguished between better and poorer quality in the educational experiences for Year 5 pupils.
- Levels of student engagement were found to be relatively high and classroom climates were generally positive. Teacher detachment was generally low and there was less pupil 'off task' behaviour observed than in previous classroom studies conducted in the 1980s.
- There was, however, considerable variation in the quality of the classroom experiences of children in different Year 5 classes, indicating that some children attend poorer quality settings, which has implications for the promotion of greater equality of educational opportunities.
- Teachers varied in many aspects of their pedagogical practice and classroom organisation (for example the teaching of analysis skills and the extent of emphasis on basic skills) and several important features of observed practices (e.g. related to classroom climate, smooth organisational routines etc).
- Most teachers broadly followed the format of the National Strategies (Literacy and Maths) except for the use of the plenary which was not observed in nearly 50% of classes.
- The quality of teaching and pupil response was found to be consistently higher in classes where a plenary was used in both literacy and numeracy lessons and lowest in classes where no plenary was used in either subject.

The impact of School Context

- Incidence of poor pupil behaviour and classroom disorganisation was observed to be greater in schools with higher levels of social disadvantage, measured by the % of pupils eligible for free school meals (FSM).
- The quality of pedagogy was also found to be poorer in schools with higher levels of social disadvantage.

Associations between classroom practice and measures of 'effectiveness'

- Observed practice was found to be better in schools that had been rated more positively by Inspectors in earlier inspections (particularly in those schools rated more highly on overall leadership and school effectiveness). This suggests that the practice of Year 5 teachers in more effective schools is related to the overall quality of the school and its leadership.
- Significant positive associations were also found between Ofsted judgements of school effectiveness and improvement since the last inspection and teachers' use of a plenary in literacy and numeracy lessons.
- Several aspects of observed practice were also found to be weakly related to better value added outcomes in English and Maths.

Conclusions and Key Messages

This Report highlights new findings on the quality of teaching and learning in Year 5 English primary classes. The results are relevant to policy makers and practitioners concerned with improving practice and promoting greater equity by closing the attainment gap associated with social disadvantage. There are implications for the further development of the National Strategies and the results highlight areas of possible weakness in the teaching in some classes that could benefit from further guidance and professional development. The findings are of relevance to the Excellence and Enjoyment (DfES, 2003) agenda and the promotion of personalised learning. They are likely to be of interest to Ofsted inspectors and to schools' approaches to the improvement of classroom practice through self evaluation and review.

Key messages

There is wide variation in teachers' practice and children's responses in Year 5 classes and this is likely to affect pupils' educational outcomes.

- The quality of classroom practice is associated with the use of plenary sessions in literacy and numeracy lessons. Practice was found to be better in classes that used plenaries in both these subjects and poorer in classes where no plenary was observed in either but plenaries were present in only approximately half the Literacy or Numeracy lessons observed.

- The quality of Year 5 pedagogy and organisation and pupil behaviour is poorer in schools with higher levels of social disadvantage in their pupil intakes. This may reflect lower expectations, difficulties in recruiting/retaining good/experienced teacher and the greater behavioural difficulties associated with teaching in more challenging contexts. The quality of Year 5 practice observed was better in schools that had been rated more highly in terms of overall school leadership, effectiveness and improvement on the previous inspection. Such schools appear to provide a more positive context for teaching and learning.

- The use of well researched classroom observation instruments may provide valuable evidence for teachers' professional development and support a school's self evaluation and review process. This is particularly relevant where they identify quality across a range of features of teaching and learning that are linked with better outcomes for children.

INTRODUCTION

Background

The Effective Pre-school and Primary Education Project 3-11 (EPPE 3-11) consists of three "Tiers". Tier 1 involves the analysis of primary school effectiveness across all primary schools in England using value added approaches measuring pupil progress across Key Stage 2 in terms of national assessment outcomes (Melhuish et al., 2006). Tier 2 focuses on following up the academic and social/behavioural progress of around 2500 individual children in the original pre-school sample across Key Stage 2 of primary education (age 7 to 11 years). Tier 3 focuses on variations in observed classroom practice during Key Stage 2 focusing on a sample of 125 schools and Year 5 classes drawn from among the 850 plus schools in which the EPPE children were located.

This short report summarises the findings of the analyses, reported in a longer Tier 3 paper (see Sammons et al., 2006). It presents results of the analysis and comparison of teachers' and children's behaviours in Year 5 classes during the Spring and Summer terms of 2004 and 2005. The paper provides a description of the sample of schools and details of the two observation instruments used to investigate teaching and learning. Interest centres on the extent to which the instruments identify variation between classes in different aspects of teachers' practice and in children's observed responses.

This paper also explores the relationship between several measures of school quality and the classrooms observation measures. It was hypothesized that more 'effective' schools and those judged to have higher quality would also show more positive classroom practices in Year 5. Two independent sets of *school quality* indicators were used to explore this association: (a) *Ofsted Judgements* of effectiveness and quality and (b*) value added indicators* of effectiveness derived from statistical analyses of the variation between schools in pupil progress across KS2 measured using national assessment data analysed for Tier 1 of EPPE 3-11 research (see Melhuish et al, 2006).

In addition, the extent to which variations in teacher behaviour or children's responses are associated with the *school context* (as measured by level of social disadvantage, using the percentage of pupils eligible for FSM as an indicator) was explored. This has implications for policies that seek to use education as a means to combat social exclusion. Disadvantage may act as a moderating influence on school and classroom processes (organisation and behaviour). In addition, teachers in schools in different contexts may have different expectations of pupils (for example, lower expectations of disadvantaged groups). School effectiveness research, for example, has consistently found that pupil composition (in terms of level of disadvantage measured by the percentage of free school meals [FSM] indicator) is associated with poorer progress (value added) for all pupil groups in schools with high concentrations of disadvantaged pupils (Sammons et al., 1997; Teddlie and Reynolds, 2000).

Overview of the report

Section 1 provides information about measures of effectiveness and school quality indicators as well as the details of the two observational instruments used for the investigation of classroom processes and teachers' behaviour. The two observation instruments used are Pianta's Classroom Observation System (COS-5) and the Instructional Environment Observation Scale of Stipek (IEO). The sample is described in this section.

Section 2 reports findings including the characteristics of the observed classrooms and teachers' behaviour assessed with COS-5 (Pianta). It describes classroom settings, the contents of curricula activity, teachers' pedagogical behaviour as well as children's academic behaviour and the quality of the interactions between teachers and children. The qualities of classroom practices and processes are also described as well as the underlying dimensions in classroom processes.

The main findings on classroom and teachers' characteristics and their relationships to attainment in Literacy and Numeracy (assessed with the IEO, Stipek) are reported. The final part of this section deals with the underlying dimensions of the IEO assessments.

Section 3 explores the relationships between classroom characteristics, teachers' behaviours and outcome measures. It describes how classroom climate, teachers' behaviour and children's academic behaviour impacts on school effectiveness and academic progress. Special attention is drawn to whether variations in teacher behaviour (and children's responses) are associated with social disadvantage.

Section 4 contains conclusions from the findings and discusses their impact.

Section 1: Measures of School Quality

1.1 Ofsted Inspection Evidence on School Quality

Classroom observation data for Year 5 classes were matched with a number of measures taken from the most recent Ofsted inspection report available for schools (from either the most recent 2003 or the earlier 2000 inspection cycle). These provided measures of: school effectiveness, the extent of improvement since the previous inspection, the effectiveness of leadership within schools, quality of teaching and learning in Key Stage 1 and Key Stage 2, and judgements about a number of pupil level measures such as exclusion, attitudes and attendance.

Schools judged to be more effective or showing more improvement across the last inspection cycle, might be expected to show more positive classroom practice. However, in exploring the associations between the classroom observation measures and inspection judgements, it must be remembered that inspection data were collected at different time points reflecting the national inspection cycle and apply to the whole school, whereas the classroom observations were conducted in 2004-2005 and are based on specific days of observation in one Year 5 class only.

Interestingly, the level of disadvantage of the school (percentage of FSM eligibility) showed little association with Ofsted inspection judgements and correlations were not statistically significant for this sample. This finding provides little evidence to support the view that inspection judgements are biased against schools in more challenging (disadvantaged) contexts. Attendance was the only Ofsted rating that was significantly correlated with the FSM indicator (r=0.51). Many studies have found attendance rates tend to be poorer for pupils of low Social Economic Status (SES) and the Ofsted ratings are likely to reflect this pattern (inspectors refer to schools' attendance data and look at registers in making their assessment).

1.2 Value Added Indicators of Pupil Progress

Value added measures of overall school effectiveness were derived from analyses of pupil progress across KS2, measured using matched national assessment data test results, (Melhuish et al. 2006). Multilevel models controlling for individual pupils' prior attainment (KS1 results) and a variety of pupil background characteristics (such as gender, FSM, ethnicity, etc.) were used to calculate differences between expected and observed attainments at the end of KS2 for each school. These differences between expected and observed attainment (also referred to as 'residuals') provide a value added indicator of each school's effectiveness in promoting pupil progress in a given outcome. Using four Key Stage 2 test results (English, Mathematics, Science and average score), value added measures were calculated for each of three years (2002, 2003, 2004) but in this paper the scores for the most recent years were closest in time to the observation period and therefore used in subsequent analyses.

The moderately strong between-subject correlations within each year indicate that, in general, schools in the observation sample show similarities in their effectiveness across different core subjects. Those that are more effective in one subject tend to be more effective also in others while those that are less effective in one area also tend to be less effective in others. The correlations between value added indicators for Mathematics and Science were higher for the two years 2003 and 2004 (0.63; 0.71 respectively) than the correlations between English and Mathematics (0.52; 0.56) or English and Science (0.48; 0.49) within the same two years.

The correlations within subjects, across the two years of the value added indictors (2003 and 2004), suggest that the stability of school effectiveness over time is stronger for Mathematics (0.56) and Science (0.56) than it is for English (0.35). It should be noted that these correlations are likely to be affected by teacher turnover in many schools. Also, because the value added indicators for any one cohort are based on linking data across the four years of Key Stage 2, they should be interpreted as providing measures of relative school, rather than individual teacher, effectiveness. Evidence from the survey of classroom teachers conducted for Tier 3 indicates that teachers were more likely to report that they followed the national Numeracy strategy guidelines closely and this may lead to greater consistency in teaching approaches across years.

Mean value added scores of school effectiveness across the years 2003 and 2004 were calculated for each focal school in the sample. A mean value added score provides a more stable estimate of effectiveness as it helps to smooth fluctuations in effectiveness over time. The mean value added scores obtained were used in all subsequent analyses.

1.3 Comparisons between Ofsted Judgements[1] and School Value Added Measures

Almost all inspection judgements apart from pupil attendance were significantly, though only weakly to moderately, correlated with the school value added indicators (see Appendix A, Table A.1). Interestingly, the correlations between inspection grades and value added indicators were generally stronger for Mathematics and Science than for English with the exception of the rating for 'ongoing assessment' which is more closely correlated for English than it is for the other two subjects.

These associations indicate that schools rated more favourably by inspectors also tend to show better pupil progress over Key Stage 2. However, inspection ratings should not be seen as a substitute for effectiveness indicators based on pupil attainment data, since the inspection focuses on a range of other evidence of quality including observation of different classes and teachers, pupil response and behaviour in class and around the school, samples of work, documentation and parents' views. Inspection results relate to a particular time point while the value added indicators are based on progress across four years (Key Stage 2). Also, poor inspection ratings act as a strong stimulus for improvement especially if schools were placed in special measures or serious weakness, thus such schools are more likely to change after an inspection and this would weaken associations between inspection judgements at a particular time point and value added measures of pupil progress for one cohort over four years in Key Stage 2.

Eligibility for free school meals (FSM) was not found to be correlated with the value added indicators of effectiveness. This is as expected since variations associated with this factor had already been accounted for in the multilevel models from which the value added indicators were derived.

1.4 The Classroom Observation Instruments

Two observation instruments were used to explore variation in classroom processes, including teachers' and pupils' classroom behaviour and experiences. The use of two instruments had a number of advantages. It enabled exploration of validity and reliability,

[1] Ofsted judgement scales are rated between 1 and 7, where 1 is high and 7 is low. Since school residuals and ratings on the classroom observation scales were low for poor performance and high for good performance, the original correlations between these scales and the Ofsted judgements were negative for positive associations (e.g. more effective schools and better pedagogy) and positive for negative association (e.g. low effectiveness better pedagogy). For ease of interpretation we reversed the signs on all correlations with Ofsted data. It should be noted that Ofsted Inspectors are trained to use a common framework and are regularly appraised and quality assured (see Matthews and Sammons, 2004).

and increased the range of behaviour studied. The instruments used were the Instructional Environment Observation Scale (IEO, Stipek, 1999) and the Classroom Observation System for Fifth Grade (COS-5, Pianta, NICHD, 2001). They were selected because they were devised relatively recently for the primary age group, cover a wide range of pupil and teacher behaviours and offer opportunity to facilitate comparison with research in other contexts (e.g. Galton et al., 1998; NICHD, 1999). The COS-5 was employed in Year 5 classes in 125 schools and the IEO in a sub-set of 93 of the same classes and schools. A brief description of the two instruments is presented in Box 1 and 2.

Box 1: The IEO (Stipek)

Instructional Environment Observation Scale (IEO) (Stipek)

Researchers using the IEO observed one complete Literacy and Numeracy lesson. There are 4 main areas of this instrument: General Classroom Management and Climate Scales for both subjects, General Instruction Scales for both subjects, +Mathematical Instruction Scales for Numeracy, and Reading / Writing Instruction Scales for Literacy.

Literacy

1. Classroom climate
2. Classroom routines
3. Cross-Disciplinary connections
4. Linkage to life beyond the classroom
5. Social support for student learning
6. Student engagement
7. Reading as meaning making
8. Basic skills development in the context of reading
9. Higher order thinking in writing
10. Purposeful development of writing skills
11. Instructional conversations.

Numeracy

1. Classroom climate
2. Classroom routines
3. Cross-Disciplinary connections
4. Linkage to life beyond the classroom
5. Social support for student learning
6. Student engagement
7. Use of maths analysis
8. Depth of knowledge and student understanding
9. Basic skill development in the context of problem solving
10. Maths discourse and communication
11. Locus of maths authority

Box 2: The COS-5 (Pianta)

Classroom Observation System for Fifth Grade (COS-5) (Pianta)

This instrument is divided into two main parts: The Frequency of Behaviour Coding System, and the Measures of Quality Coding System.

The Frequency of Behaviour Coding System

The Frequency of Behaviour Coding System is used in the first of the two 10-minute observation segments. This part includes the coding of child and teacher behaviours across a range of classroom and curriculum settings. For the duration of this part of the observation, a target child (TC) is observed and recorded during a sequence of ten 60-second intervals (30-seconds observe, 30-seconds record) during which focus is placed upon capturing information in five general areas of the target child's classroom behaviour and experience.

The categories are:

Child level setting - the classroom setting in which the target child is working:

1. Whole class
2. Large group >6
3. Small group - 6 or fewer
4. Individual

Content of target child's activity - The nature of the activity in which the target child is engaged in including:

1. Subject areas (e.g. Literacy, Numeracy, etc.),
2. Sub categories within a sub area (e.g. Word-Level and Comprehension in Literacy)
3. Part of Literacy and Numeracy hour as describe by the NLS (specifically adapted for use in the UK)
4. Non-curricular activities such as Enrichment and Free Time.

Teacher behaviour - Interaction with the target child:

1. Attending to target child (directly)
2. Teaching basic skills
3. Teaching analysis
4. Managerial instructions
5. Monitoring and checking work
6. Displaying positive or negative effect and discipline.

Child academic behaviour:

Type of behaviour	**Degree of involvement**
1. Learning/performing basic skills	1. Engaged
2. Learning/performing analysis	2. Highly engaged
3. Collaborative work	3. Unproductive
4. Requesting attention/help/information	4. Off task or alternative academic behaviour
5. Volunteers	

Child social behaviour - social interactions with peers and adults in the classroom:

1. Positive/neutral engagement with peers
2. Negative/aggressive engagement with peers
3. Positive effect towards teacher
4. Negative effect towards teacher
5. General disruptive behaviour.

The Measures of Quality Coding System

This part of the observation instrument is dedicated to ten minutes continuous observation of behaviours and characteristics of the target child and the teacher in the classroom at a more global level. This section contains two broad categories: Child Codes and Classroom Codes. Under these main headings there are a number of sub-headings or constructs (behaviours, characteristics) that must be rated.

Child codes	**Classroom codes**
1. Positive Affect	1. Richness of instructional methods
2. Self-Reliance	2. Over-Control
3. Sociable/Co-operative with peers	3. Chaos
4. Attention	4. Teacher Detachment
5. Disruptive	5. Positive classroom climate
6. Activity level	6. Negative classroom climate
7. Child-Teacher Relationship	7. Productive use of instructional time
	8. Evaluative Feedback
	9. Teacher sensitivity (Main teacher only).

Items are rated on a seven-point scale (1 very uncharacteristic to 7 very characteristic).

1.5 The Sample

The project identified a purposive school sample based on indicators of school effectiveness (across a range of 'effectiveness' scores derived from the value added analyses of pupil progress across Key Stage 2 measured in 2002 from the EPPE 3-11 Tier 1 analyses) and the number of EPPE children enrolled (4 or more). The sample therefore included approximately equal numbers of relatively 'effective' and 'ineffective schools' in each region of the study and involved a total of 125 schools.

Section 2: Classroom and Teacher Characteristics

Instructional Environment Observation Scale (IEO) (Stipek)

This instrument has a strong focus on pedagogical practices associated with learning in Literacy and Mathematics (see Box 1, page 5 for details of domains). The IEO (Stipek) instrument was used in 93 Literacy lessons and 93 Numeracy lessons.

2.1 Literacy

Most variation between classes was found for the following seven scales: 'Cross-Disciplinary connections', 'Linkage to life beyond the classroom', 'Reading as meaning making', 'Basic skill development in the context of reading', 'Higher order thinking (HOT) in writing', 'Purposeful development of writing skills', and 'Instructional conversation'.

The emphasis on 'Basic skill development in the context of reading' showed a particularly wide spread with over a third of classes given the lowest rating. 'Reading as meaning making', by contrast showed few classes receiving a low score. Approximately 70 per cent of classes were rated favourably for 'Classroom climate'. In line with findings for the COS-5 instrument, the IEO suggests that pupil engagement levels were high in the majority of Literacy classes/lessons observed. The extent to which teachers made 'Cross-Disciplinary connections' was relatively uncommon in most classes although 'Social support for student learning' was, in general, fairly positively rated.

Higher scores on 'Cross-Disciplinary connections' and 'Linkage to life beyond the classroom' indicate the extent to which teachers seek to widen interest in Literacy beyond the confines of the subject and make it more relevant to their pupils. The highest variations across schools were found for the scale measuring the focus on 'Basic skills development' in reading and writing.

2.2 Numeracy

The lowest mean scores on the IEO Numeracy scales reflect the extent to which teachers provide a wider context for material learned in class. 'Cross-Disciplinary connections' and 'Linkage to life beyond the classroom' had the lowest mean scores indicating that the majority of teachers were infrequently observed to draw wider connections with other subjects or activities outside of the subject during Numeracy lessons.

The item 'Basic skill development in the context of problem-solving' showed wide variation with a minority (a little over a fifth) rated very low on this aspect and a smaller proportion (10%) rated very highly. The lack of attention to basic skill development (in the context of problem solving) in a minority of classes may be a cause for concern as it is associated ($r=0.69$) with 'Depth of knowledge and student understanding'. The pattern for 'Use of Maths analysis' was very similar. As in the Literacy lessons, 'Student engagement', 'Classroom climate' and 'Social support for student learning' were generally highly rated in most Year 5 classes.

The greatest variations across teachers were found for teaching/pedagogy items particularly in 'Use of Maths analysis', 'Basic skill development in the context of problem solving' and 'Locus of Maths authority'. The low ratings for 'Linkages to life beyond the classroom' (this item received the lowest rating in 60% of classes) suggests that many teachers may make little reference to real life contexts and may be missing opportunities to enhance pupil awareness of wider applicability of mathematical concepts and approaches.

The strongest associations were between 'Classroom climate' and 'Classroom routines' (0.81), 'Social Support for student learning' (0.75) and 'Student engagement' (0.74). Similarly, 'Classroom routines' was strongly correlated with 'Social Support for student learning' (0.70), 'Student engagement' (0.77) and 'Locus of Maths authority' (0.62). 'Social support for student learning' was also strongly correlated with 'Student engagement' (0.76).

Strong correlations were also found between 'Use of Maths analysis' and 'Depth of knowledge and student understanding' (0.75), 'Basic skill development in the context of problem solving' (0.67), 'Maths discourse and communication' (0.68) and 'Locus of Maths authority' (0.66). 'Depth of knowledge and student understanding' was strongly correlated with 'Basic skill development in the context of problem solving' (0.69), 'Maths discourse and communication' (0.80), and 'Locus of Maths authority' (0.68). 'Maths discourse and communication' showed strong correlations with 'Basic skill development in the context of problem solving' (0.65) and 'Locus of Maths authority' (0.68).

These analyses reveal the extent of similarity, and by contrast, differences in the classroom experiences of children taught in different Year 5 classes. They also provide information about variation in quality and emphases that are relevant to development of the National Primary Strategies as the variation in certain aspects of teaching may provide valuable clues on areas of weakness or for professional development of teachers to improve the quality of the teaching and the learning experiences of pupils in Key Stage 2.

2.3 Underlying Dimensions in Classroom Processes (IEO)

Data from the Literacy and Numeracy scales of the IEO instrument were analysed separately. Analysis of both Literacy[2] and Numeracy yielded similar factors – '**Pedagogy', 'Subject development' and 'Learning linkages**' - explaining 73 per cent of the variance in the individual Literacy items, and 76 per cent of the variance in the Numeracy items. The Literacy and Numeracy items that form particular factors are reported in Box 3.

[2] The analysis of the Literacy scale included only nine of the 11 items. The two remaining items - 'Reading as meaning making' and 'Basic skills development in the context of Reading' - were not included as these two activities were mutually exclusive and would rarely co-occur within the same observation cycle, consequently the number of observations for these items were too small to include.

Box 3: Underlying dimensions of the IEO

Literacy	Numeracy
Pedagogy 1. Classroom climate 2. Classroom routines 3. Social support for student learning 4. Student engagement 5. Instructional conversations **Subject development** 1. Higher Order Thinking (HOT) in writing 2. Purposeful development of writing skills **Learning linkages** 1. Cross-Disciplinary connections 2. Linkage to life beyond the classroom	**Pedagogy** 1. Classroom climate 2. Classroom routines 3. Social support for student learning 4. Student engagement **Subject development** 1. Use of Maths analysis 2. Depth of knowledge and student understanding 3. Basic skill development in the context of problem-solving 4. Maths discourse and communication 5. Locus of Maths authority **Learning linkages** 1. Cross-disciplinary connections 2. Linkage to life beyond the classroom

The factor structures underlying the IEO Literacy and Numeracy data were conceptually similar. Three factors were extracted for each set of data relating to: 'Subject development', 'Pedagogy' and 'Learning linkages' dimensions. The items most closely associated (loading) with the factor 'Learning linkages' were the same for both Literacy and Numeracy; the items loading on 'Pedagogy' were again the same with the exception of 'Instructional conversation' which was an additional item to load on Literacy; the 'Subject Development' factors were subject specific. These factors provide a helpful way to analyse and summarise differences in observed Literacy and Numeracy teaching in Key Stage 2. Classes where scores were higher on these three factors provide higher quality educational experiences for children.

2.4 Classroom Observation System for Fifth Grade (COS-5) (Pianta): The Frequency of Behaviour Coding System

This instrument has a strong focus on the general classroom environment (see Box 2).

Overall 1009 observations were conducted in the 125 schools using the COS-5 Pianta instrument. For each school, observers were required to complete a minimum of 8 twenty minute observation cycles. These observation cycles had to include:

1 Start of the day observation
1 Start of the afternoon observation
2 Literacy observations
2 Numeracy observations
1 Science or Social Science observation
1 additional academic subject (could be another Literacy, Numeracy, Science or Social Science).

Researchers were therefore asked to schedule all of their observations on days and times when the teacher reported that most instruction would be occurring, or what came to be known as 'typical days.'

Table 1 presents the number of children observed in each school and the number of cycles and Table 2 presents the total number of cycles broken down by lesson type.

Table 1: Number of cycles as a function of number of schools

No of children observed (No of 10-min Cycles)	7	8	9	10	**Total**
Number of schools	2	113	9	1	125
Total	14	904	81	10	1009

Table 2: Number of cycles broken down by type of lesson

Curricula subject	**Number of cycles**
Start of the day	72
Start of the afternoon	71
Literacy	153
Numeracy	149
Science	76
Social science	44
Other	3
Total (observed in 2004)	568
Unclassified (observed in 2005)	441
Total	**1009**

Of the 1009 observations, 441 were not classified according to lesson type. However, the proportional representation of each lesson would have been similar to that presented in Table 2 for the 568 observations conducted in 2004 (25% for Literacy, 25% for Numeracy and around 13% for science).

Classroom Organisation

Researchers categorized their observations according to the way teachers organized children's activity in terms of whether it was as part of a whole class, group or individual way of working (termed setting). The most dominant setting observed was 'Whole class', with 'Individual' setting accounting for 36 per cent of the time. Observations of 'Large' and 'Small group' settings were generally limited.

Within each of the three core subjects (Literacy, Numeracy and Science) children were observed working in 'Individual' child settings most often during Literacy (37%) followed by Numeracy (35%) and less commonly in Science (25%); these differences were statistically significant. 'Whole class' setting was most common during Science (64%); 'Small' and 'Large group' activities were also most likely to occur during Science (11%).

The proportion of 'Whole class' settings identified in the observations is higher than that reported by Galton et al. (1999), who found that children were engaged in whole class during Science only for a third of the time. There are a number of possible reasons for this apparent difference. One main difference is likely to relate to definitions of 'whole class activity'. In Galton et al.'s research the definition was based on observations of **teachers' communication patterns** (whether an interaction was made with the whole class, an individual child or a group). In the two instruments used here, the interaction is seen **through the eyes of the target child.** In our observations 'Whole class' refers to those

instances where the whole group of children are receiving the same instruction, at the same time from the teacher or another adult. In the Galton research a teacher answering a child's individual question during a whole class lesson would be coded as 'Individual'. In the COS-5 observations an incident of a teacher answering a child's individual question during a whole class lesson would still be coded as 'Whole class', as through the eyes of the target child they are still being taught in a whole class setting. Other possible reasons may include the stronger focus of the observations on the core subjects (particularly Literacy and Numeracy lessons) and changes in teachers' organizational strategies as a result of the National Strategies.

'Individual' and 'Whole class' settings generally dominated classroom organisation. However, there was considerable variation between individual classes in teachers' use of different forms of setting. The distributions were fairly normal, indicating that only a minority of classes have very high or very low levels of observed 'Whole class' or 'Individual' groupings.

Contents of Curricula Activity

Collecting information during the Literacy hour was one of the modifications made to the COS-5 instrument to make it more sensitive to the English school context. Researchers were asked to identify the part of the Literacy hour they were observing according to the description provided by the National Literacy Strategy (NLS) guidelines (see Appendix B).

During the Literacy sessions observed, around two thirds (65%) of the time was spent in a 'Whole class' context. 'Individual' setting dominated within the third part of the Literacy Hour (along with group work) and on average accounted for just over a third (35%) of observations. Results indicate that on average, times in different parts of the lesson in different settings are broadly in line with that described as a typical pattern by NLS; however there was considerable variation between individual Year 5 classes.

The percentage of observations in plenary sessions during Numeracy lessons was slightly greater than that during the Literacy session; 2.4 per cent on average in Mathematics versus 1.4 per cent on average in Literacy (though a direct comparison is not possible since the Literacy lesson is divided into four parts and the Numeracy into only three).

It was hypothesised that the lower amount of time in which plenary activity was observed across the 125 classes could be the result of the timing of the observation (as previously described) rather than the absence of plenary sessions. Consequently, during the second round of data collection, an addition was made to the IEO instrument to record all parts of the Literacy and Numeracy lessons observed by the researchers. For the IEO instrument complete lessons were observed. It was found that plenary sessions occurred in only half of the full lessons observed (50.7% in Literacy and 47.8% in Numeracy). The results supported the findings from the COS-5 instrument where the low average time spent in plenary work was partly due to the absence of any plenary session in many classes. The use of a plenary session is intended to provide opportunities for teachers to review the lesson aims and content with pupils and provide feedback to help consolidate learning. The absence of a plenary session in Literacy and Numeracy lessons in around half the Year 5 classes observed suggests some teachers may not be aware of the purposes and value of plenary sessions, or an indication of weaknesses in classroom planning or organisation where a plenary may be intended but earlier activities in the lesson over run.

Teachers' Pedagogical Behaviour

Considerable variations in teachers' pedagogical behaviours were observed between classes (and schools). There were large variations in the time spent teaching basic skills; in contrast the time given to teaching analysis skills was less varied. On average teachers were observed to be teaching analysis skills for about a third of the time whereas on average teachers spent 67 per cent of classroom time teaching basic skills. The distribution of analysis teaching was skewed with little or none observed in around 30 per cent of classes. Similarly teachers' use of monitoring and managerial instructions varied, it being a prominent feature of a minority of classes observed.

Child Academic Behaviour

Four types of child academic behaviour were identified in the observations: 'engaged', 'highly engaged', 'unproductive' and 'off-task'. Target children were observed to be productively engaged in their lesson for approximately 78 per cent of the time (64% engaged, 14% highly engaged). Only a relatively small proportion of time was classified as pupils being 'off task' (on average 3%) and in over half of classes no 'off-task' behaviour was observed. This incidence of 'off-task' behaviour is less than reported in Galton et al.'s, (1980;1997) study of junior age pupils or in the study by Mortimore et al. (1988) both of which used the ORACLE observation instrument in different contexts. When Galton et al. (1999) studied the same schools 20 years on (in 1997) they also found a significant decrease in the time children were observed 'off-task' suggesting that pupil engagement had increased over the period 1977 to 1997. This may reflect better teacher planning and the influence of the national strategies. The present data likewise indicate that observed 'off-task' behaviour is lower than that found in studies in the 1970s and 1980s.

Overall, 'unproductive' behaviour accounted for an average of 19 per cent of the time observed. Whether the 'unproductiveness' is self-induced by the pupil or the result of the absence of an academic activity assigned by the teacher (during transitions, after completion of a task, or for other reasons), the child academic behaviour is coded as 'unproductive'. A high proportion of 'unproductive' time may be an indicator of poor organisation by the teacher. 'Unproductive' behaviour, was much more common than 'off-task' behaviour, being a significant feature of observations of child behaviour in some classes (representing 3 or more out of 10 minutes in 20% of classes). When analysed by subject areas, episodes of 'unproductive' and 'off-task' behaviours were found to be slightly more common in Literacy lessons (21%), when compared with Mathematics (16%) and Science (17%).

Child Teacher Interaction (Child Social Behaviour)

Four behavioural measures are recorded for both child and teacher, these include i) child requesting attention, help or information/teacher attends to target child, ii) teacher or child displays negative affect, iii) teacher or child displays positive affect, and iv) child displays disruptive behaviour and teacher disciplines. Overall, teachers appear to be attending to children more frequently than children are requesting attention or help. This may reflect teachers' skills in identifying potential need and may help to account for the low proportion of time 'off-task'.

Children were observed to express 'Positive affect' more often than teachers. There were many classes where there was no incidence of 'Positive affect' (over 75%) by the teacher. This suggests that the target child received very little direct positive teacher interaction. Previous observational studies (in the 1970s and 1980s) have indicated that teacher's use

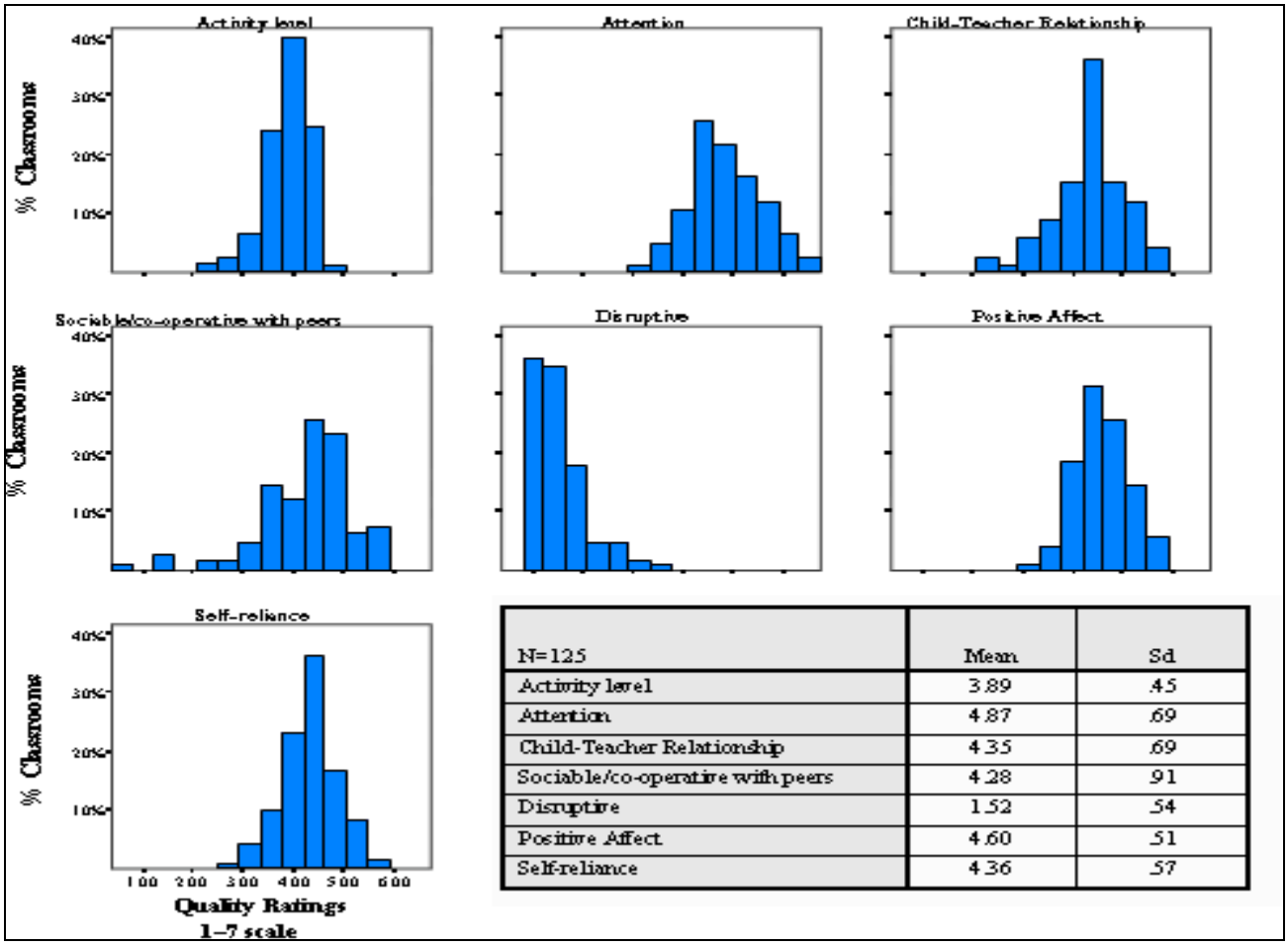
of positive comment and feedback is low and the present study also points to a similar pattern.

2.5 Classroom Observation System for Fifth Grade (COS-5) (Pianta): Measures of Observed Quality of Classroom Practice

Child classroom behaviours (Global dimensions)

Classroom practice varied widely across a number of areas including 'Attention', 'Sociable/co-operative with peers', 'Self-reliance' and 'Child-Teacher Relationship'. 'Sociable/co-operative with peers' had the highest standard deviation (see Figure 1), which suggests that teachers vary in the extent to which they encourage pupil co-operation in Year 5 classes (the type of tasks assigned and the level of co-operation they encourage). In contrast 'Activity level', (activity, restlessness and fidgeting) had the lowest standard deviation of all child codes. In interpreting these charts it should be noted that some are more widely dispersed than others. Where results are skewed in one direction this means in most classes there was little difference observed. For example, for the measure 'Disruptive' behaviour very little was observed in most classes so the distribution is skewed towards the low end. However in a few classes higher levels were seen.

Figure 1: Variations between classes in Children's observed behaviour



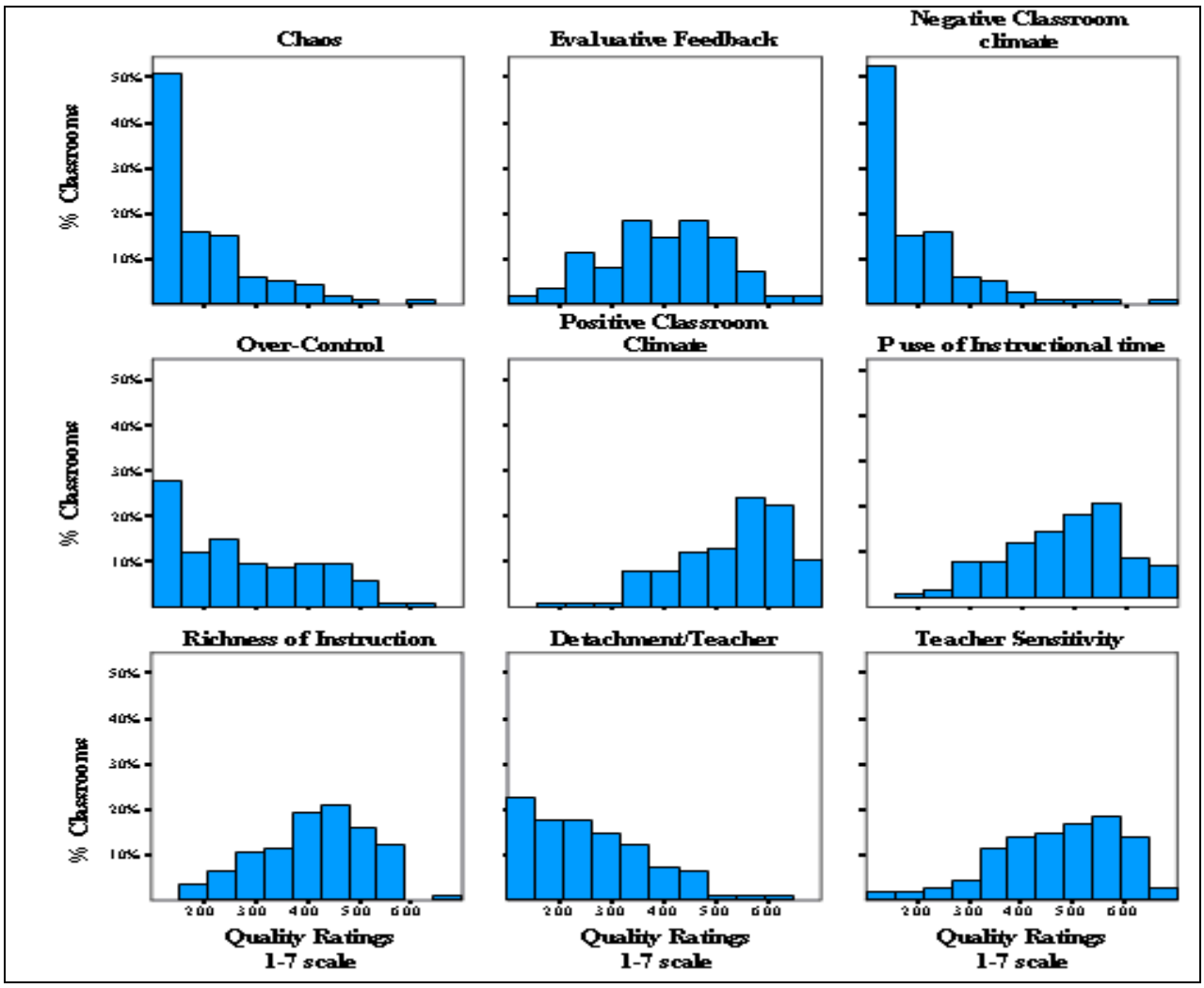
N=125	Mean	Sd
Activity level	3.89	.45
Attention	4.87	.69
Child-Teacher Relationship	4.35	.69
Sociable/co-operative with peers	4.28	.91
Disruptive	1.52	.54
Positive Affect	4.60	.51
Self-reliance	4.36	.57

Teachers' Classroom Practice and Processes

Classroom practices also varied across schools on the nine classroom codes. The largest variation across schools was on 'Over-Control.' This was a relatively uncommon feature (40% of classes were rated low on this scale) of most classes but in a very small minority (4%) there were high scores for 'Over-Control'.

'Chaos' and 'Negative Classroom Climate' both showed highly skewed distributions indicating that in most classes these aspects were rare. Over 50 per cent of classrooms received the most favourable rating on these scales. By contrast the ratings for 'Evaluative Feedback', 'Teacher Sensitivity', 'Richness of Instructional Methods' and 'Productive use of Instructional time' showed a wider spread across classes (see Figure 2).

Figure 2: Distributions of Classroom practice and processes



The extent of variation between classes is important because it indicates that Year 5 children have very different classroom experiences in specific features of pedagogy that may affect learning and achievement.

Most of the child and classroom global codes were significantly correlated with each other; consequently a Principal Components analysis was used to explore underlying dimensions in these measures. A Principal Components analysis shows how different items cluster with other items; these clusters contain conceptually similar items. The dimensions identified by clusters of items in the data set are termed factors and help in interpreting the main features of teachers' observed practice.

2.6 Underlying Dimensions in Classroom Processes (COS-5)

Data from the COS-5 child and classroom observations were analysed and five distinct factors were identified, accounting for 76% of the variance in the 16 individual item scores (see Box 4).

Box 4: Underlying Dimensions for the COS-5

Quality of pedagogy
1. Classroom codes - Richness of instructional method
2. Classroom codes - Detachment/Teacher
3. Classroom codes - Positive classroom climate
4. Classroom codes - Productive use of instructional time
5. Classroom codes - Evaluative Feedback
6. Classroom codes - Teacher Sensitivity

Disorganisation
1. Child code - Disruptive
2. Classroom codes - Chaos
3. Classroom codes - Negative classroom climate

Child positivity
1. Child code - Self-Reliance
2. Child code - Sociable/co-operative with peers
3. Child code - Child-Teacher Relationship

Positive engagement
1. Child code - Positive Affect
2. Child code - Activity level

Attention and control
1. Child code - Attention
2. Classroom codes – Over-Control

The first factor to be extracted represents general classroom processes and pedagogy and was termed '**Quality of pedagogy'**. This factor is associated with six of the classroom quality measures (see Box 4).

Child's 'Disruptive' behaviour, 'Chaos' and 'Negative classroom climate' formed the second factor. This dimension identifies the extent of classroom '**Disorganisation**'. High scores are characterised by general chaotic and negative classroom climate and pupils' disruptive behaviour. This clustering indicates that disruptive behaviour and negative or chaotic classroom atmosphere are likely to coincide; however, whether a chaotic atmosphere in the classroom produces disruptive behaviour or whether it is caused by it cannot be ascertained. It seems likely that the two tend to reinforce each other.

*'*Self-Reliance', 'Sociable/co-operative with peers' and 'Child-Teacher Relationship' converged into the third dimension, suggesting in classes where children are observed to be more self-reliant, they are also more likely to demonstrate the social skills of co-operation. This dimension is referred to as '**Child positivity**'.

*'*Activity level' and child 'Positive affect' formed the fourth factor. We refer to this dimension as '**Positive engagement**' as this clustering indicates that in classes where children are observed to be occupied they are also more likely to be rated as happy.

Finally, the fifth factor to be extracted brought together 'Attention' and 'Over control' into a single dimension termed '**Attention and control**'. This is in many respects the inverse of the 'Disorganisation' dimension where 'Chaos' and 'Disruptive' behaviour are replaced by more control and attentive behaviour.

2.7 Summary of main findings from Section 2

Main Findings

IEO (Stipek)

Pedagogy in Literacy and Maths

- The highest variations across schools were found for the scale measuring the focus on 'Basic skills development in the context of reading'.
- 'Reading as meaning making', by contrast showed few classes receiving a low score.
- Approximately 70 per cent of classes were rated favourably for 'Classroom climate' in Literacy observations.
- 'Cross-Disciplinary connections' and 'Linkage to life beyond the classroom' had the lowest mean scores, in Numeracy observations, indicating that the majority of teachers were infrequently observed drawing wider connections with other subjects.
- 'Basic skill development in the context of problem-solving' showed wide variation with around 20% of schools rating very low on this aspect and a smaller proportion (10%) rating very highly.
- The factor structures underlying the IEO Literacy and Numeracy data were conceptually similar.
- Three factors were extracted for each of the IOE sub-scales; Pedagogy, Subject development and Learning linkages.

Cos-5 (Pianta)

Classroom organisation

- 'Individual' and 'Whole class' settings generally dominated classroom organisation.
- 'Individual' child setting was most common during Literacy.
- 'Whole class' setting was most common during Science.

The National Strategies

- Time spent in different parts of the lesson in different settings were broadly in line with that described as a typical pattern by National Literacy Strategy (NLS).
- Plenary sessions occurred in only half of the full lessons observed.
- The percentage of observations in plenary sessions during Numeracy lessons was slightly greater than that during Literacy lessons.

Teacher pedagogy

- On average teachers were observed to be teaching analysis skills for about a third of the time whereas teachers were observed on average spending around two thirds of teaching time teaching basic skills. The distribution of analysis teaching was skewed with little or none observed in around 30% of classes.
- In 75% of classes there was no incidence of 'Positive affect' by the teacher.
- Classroom practice varied widely across schools on most of the global measures, indicating that Year 5 children have very different classroom experiences in specific features of pedagogy that may affect learning and achievement.
- Teachers appear to be attending to children more frequently than children are requesting attention or help.

Pupil behaviour

- Target children were observed to be productively engaged in their lesson for approximately 78% of the time.
- 'Unproductive' behaviour was much more common than 'off-task' behaviour occurring 19% of the time.
- 'Unproductive' and 'off-task' behaviours were slightly more common in Literacy lessons (21%), when compared with Mathematics (16%) and Science (17%).
- Children were observed to express 'Positive affect' more often than teachers.
- 'Disruptive' behaviour, 'Chaos' and 'Negative classroom climate' showed highly skewed distributions suggesting that in most classes these aspects were rare.

Classroom climate

- Five distinct underlying dimensions were identified for the child and classroom codes using a Principle Component analysis; Quality of pedagogy, Disorganisation, Child positivity, Positive engagement and Attention and control.

Section 3: Relationships between Classroom Observational Measures and School

Characteristics and Quality

The relationships between 'Disadvantage', 'School effectiveness' (measured by inspection judgements and the value added indicators), and the underlying factors (dimensions) of teacher and pupils' Year 5 classroom behaviours (measured by the two observation instruments) were investigated. The relationships between observed classroom practice and school characteristics were explored separately for the two observation instruments. Only statistically significant correlations are reported.

3.1 IEO (Stipek)

The correlations between the school quality measures and the IEO Literacy and Numeracy factors as well as the individual Literacy and Numeracy items were investigated (see also Appendix A, Tables A.6 to A.9). These measures tended to show a clearer pattern than those found for the COS-5 factors.

3.2 School Effectiveness

School value added residuals for English were moderately significantly and positively correlated with the Literacy 'Pedagogy' factor (r=0.24), and the value added residuals for Mathematics were significantly and positively correlated with the Numeracy 'Subject development' factor (r=0.26). English residuals were also positively but more weakly correlated with 'Pedagogy' in Numeracy (r=0.18) and Mathematics residuals were positively but weakly associated with 'Pedagogy' in Literacy (r=0.20).

Ofsted judgements of 'School effectiveness' were moderately but significantly and positively correlated with both the 'Pedagogy' and 'Subject development' factors in Literacy (r=0.24 and r=0.25) and Numeracy (r=0.25 and r=0.22). These relatively moderate to weak but consistently positive patterns of association indicate that observed practice in Year 5 tended to be rated more positively in schools that were more effective in promoting pupils' academic progress across Key Stage 2 and in those previously rated more favourably by inspectors.

Ofsted judgements of 'Improvement since last inspection' were moderately significantly and positively correlated with the 'Subject development' factor in Literacy (r=0.27). Of the two items associated with this factor only the 'Purposeful development of writing skills' item of the Literacy scale was significantly and positively correlated with 'Improvement since last inspection' (r=0.38). During the period 2001-2005 schools became more confident in the implementation and development of the National Literacy strategy and there was an increasing focus on writing, especially for boys in the upper years of KS2 (DfEE, 2000; DfES, 2001b). The correlation between the extent of school improvement previously identified by inspectors in the sample schools and observation evidence on this aspect of Literacy suggests that the most improved schools may have laid more emphasis on developing teachers' practice in Literacy and particularly on writing development.

3.3 Other Ofsted Measures

Leadership and On-going assessment

Ofsted judgement on school 'Leadership' was positively correlated to several aspects of classroom practice including the 'Subject development' factor in Literacy (r=0.28) and the 'Pedagogy' factor in Numeracy (r=0.23). These findings, again, support the conclusion that school influences can have an indirect impact on teachers' classroom practice providing evidence that schools with more effective leaders tend to have better observed classroom practice in Year 5 in several areas.

Teaching and Learning

The Ofsted judgement of the quality of 'Teaching' and 'Learning' during KS1 was significantly and positively correlated with 'Subject development' in both curriculum areas. The quality of 'Teaching' and 'Learning' during KS2 was significantly correlated with 'Subject development' in Literacy but not Numeracy. Again these results suggest that despite the different timescales and frames of reference, there is evidence of better observed classroom practice in specific aspects of teaching in Year 5 classes in schools judged more favourably in Ofsted inspections. Thus, research and inspection perspectives support the view that better school leadership and quality provides a supportive environment for the practice of individual class teachers.

Pupil outcomes

There were significant positive associations between the 'Pedagogy' Literacy factor and Ofsted judgements of pupils' 'Attitudes to school' (r=0.24) and 'Attendance' (r=0.23) (Appendix A Table A.6). The Literacy item, 'Classroom routine', was correlated with two out of three Ofsted measures of pupil outcomes namely 'Behaviour including exclusion' (r=0.30) and 'Attitudes to school' (r=0.38). 'Classroom climate' was correlated with the inspection rating of pupils' 'Attitudes to school' (r=0.29).

There was also a significant positive association between 'Attendance' and 'Subject Development' in Numeracy. All five items loading on this factor ('Use of Maths analysis', 'Depth of knowledge and student understanding', 'Basic skill development in the context of problem solving', 'Maths discourse and communication' and 'Locus of Maths authority') were moderately to strongly correlated with the Ofsted measure 'Attendance'. 'Social support for student learning' was similarly correlated with 'Attendance'. In addition, 'Classroom climate', 'Classroom Routine' and 'Use of Maths analysis' were positively correlated with both pupils' 'Behaviour including exclusion' and 'Attitudes to school'.

Disadvantage (% pupils FSM eligibility)

'Pedagogy' in Literacy was significantly and negatively correlated with level of social disadvantage, measured by % of pupils eligible for FSM (r=-0.36). In Literacy, four individual items loading on the 'Pedagogy' factor ('Classroom climate', 'Classroom Routine', 'Social support for student learning' and 'Student engagement') were significantly and negatively correlated with FSM. For Literacy these aspects of pedagogy seem to be sensitive to pupil context and may reflect the influence of teacher expectations and/or pupil behaviour. In contrast, for Numeracy it was the more specific aspects of mathematics teaching, such as 'Depth of knowledge and student understanding', 'Maths discourse and communication' and 'Locus of Maths authority' that were more related to level of social disadvantage than the more general aspects of classroom pedagogy such as climate and routine. The factor 'Subject development' in Numeracy (on which these items load) was similarly correlated with disadvantage but the association was weak (r=-0.23).

Taken together with the evidence already reported on the main COS-5 observations, the findings for the IEO instrument indicate that important features of teachers' classroom practice are associated with the level of social disadvantage in a school. Though only modest, the associations tend to be negative in relation to features of pedagogy indicating a tendency for poorer quality practice in schools where levels of disadvantage are higher. This may be related to lower teacher expectations, less experienced or poorer teachers, or to difficulties relating to pupil behaviour, attitudes and attendance. The findings warrant further investigation, given concerns about the gap in attainment related to pupil background that has been shown to increase as children progress through school. Part of the explanation may be that disadvantaged children, for a range of reasons, are likely to experience poorer teaching in Key Stage 2. These are only tendencies and further case

studies of classroom practice in successful high disadvantage schools could provide specific guidance on ways to improve the quality of teaching and learning in less successful high disadvantage schools. The present research points to those areas of classroom practice and pedagogy that are worth further investigating.

3.4 COS-5 (Pianta)

Only a few statistically significant associations were found between the COS-5 factors (and individual items) and the school value added indicator for Mathematics. In addition, level of social disadvantage of school context (FSM eligibility based on % of pupils), 'School effectiveness' and 'Improvement since last inspection' also showed significant correlations with the COS-5 factors and items (see Appendix A, Tables A.2 to A.5).

3.5 School Effectiveness

Overall, school value added indicator for English was not correlated with any of the COS-5 factors or individual items on the instrument. The value added indicator for Science was correlated only with the 'Self-reliance' item of the COS-5 child codes.

School value added residuals for Mathematics were significantly and positively correlated with the factor 'Quality of pedagogy'. The Ofsted judgement of overall 'School effectiveness' was also positively correlated with this factor but the correlation was weaker and just missed statistical significance ($p<0.06$). These results suggest that there are links between the more global construct of school effectiveness as identified by inspectors, and specific aspects relating to the quality of teaching in specific classes. The classroom practice of teachers in a more effective school may be influenced by the school (indirectly or directly). In a more effective school, an individual teacher may receive more professional development or guidance that supports their teaching. School effectiveness research has indicated that the school culture and leadership can affect teacher expectations and behaviour and more effective schools may be better at recruiting / retaining better teachers (Mortimore et al., 1988; Sammons et al., 1997; Hopkins et al., 2001; Leithwood et al., 2006). These findings lend support to the conclusion that overall school effectiveness can affect classroom practice.

The factor 'Attention and Control' was significantly correlated with better scores in terms of professional judgment of effectiveness of the school by inspectors. The correlation analysis of the individual items revealed that while 'Attention' was significantly correlated with the effectiveness ($r=0.26$) judgment by inspectors, the item 'Over-control' was not. 'Attention' was also significantly correlated with 'Improvement since last inspection' ($r=0.24$) and school 'Leadership' ($r=0.22$) judgements. This suggests that in schools, judged to have made more improvement and to have better leadership, pupils are in classroom settings where they are more likely to be engaged with their work. Conversely, where there has been less improvement it appears that pupils show lower levels of engagement in class.

The 'Child positivity' factor (based on the items 'Self-reliance', 'Sociable/co-operative with peers' and Child-Teacher Relationship) was significantly correlated with the Ofsted judgement of 'Improvement since last inspection' but not with 'School effectiveness'. However, the 'Self-reliance' item in this cluster was significantly correlated with both the 'School effectiveness' Ofsted judgement ($r=0.36$) and with the Ofsted judgement for 'Improvement since last inspection' ($r=0.39$) in the analysis of the individual items, as well as with the Ofsted judgements of 'Teaching' and 'Learning' during Key Stage 2 ($r=0.20$ for both). The observation item of 'Self-reliance' was also weakly correlated with the school value added residuals for Mathematics but just failed to reach significance.

The item 'Self-reliance' is an observational measure of the extent to which pupils display autonomy, take responsibility and show initiative and leadership in class. It could be argued that this is more likely to be observed in classrooms where teachers create a climate which encourages pupils to demonstrate and develop these traits. 'Self-reliance' appears to be more evident in classes within schools identified by inspectors as more effective and having shown greater improvement.

3.6 Disadvantage (% pupils Free School Meal [FSM] eligibility)

The factor measuring classroom 'Disorganisation' was significantly and positively correlated with the percentage of pupils eligible for FSM. All three individual items loading on this factor ('Chaos', 'Disruptive' behaviour and 'Negative classroom climate') were also significantly correlated with this measure. This supports the view that teaching in high disadvantage schools is likely to be more challenging due to poorer pupil behaviour, although further analyses are needed to see if 'Disorganisation' is also higher where teachers are less experienced; since high disadvantage schools may find teacher recruitment and retention more problematic than low disadvantage schools (the teacher questionnaire provides evidence to explore this aspect further).

'Disorganisation' (as well as the associated items) was also negatively correlated with Ofsted judgement on pupil 'Attendance'. 'Attendance' was judged more favourably in schools where classroom climate was positive (r=0.22), but less favourably in schools where classroom climate was negative (r=-0.26) or where classes where chaotic; where time was wasted repeating instructions and the establishment of smooth routines and transitions between activities was problematic (r=-0.30). Pupils' 'Attitudes to school' had been more favourably judged, by Ofsted, in schools where observations found teachers made 'Productive use of instructional time' (r=0.24 - item loading on the 'Quality of pedagogy' factor). This suggests that pupils' 'Attitudes to school' are less positive where classroom organisation is poor and potential learning time is lost. It may be that poorer attitudes and attendance are a reflection or symptom of less effective teaching practices, but equally it may be that in schools with poorer pupil attitudes and attendance it may be harder for teachers to create productive classroom routines and climate.

These findings indicate that social disadvantage, school effectiveness and teaching quality are inter-linked and additional analyses will be conducted using multilevel models for the EPPE 3-11 sample to investigate these relationships further.

3.7 Use of Plenary Sessions in Literacy and Numeracy, Quality and Effectiveness

Given the evidence (reported in earlier sections) that around half of Year 5 classes observed did not use a plenary session for Literacy or Numeracy lessons, further analyses were conducted to see whether schools in which the plenary was adopted differed in terms of our extra measures of school characteristics. There is evidence that inspectors rated schools, in which the Literacy plenary was observed, more favourably on a number of aspects. Ofsted judgements on overall 'School effectiveness', 'Improvement since last inspection', and on-going assessment were more positive in schools where the Literacy plenary session was observed and the differences were statistically significant.

Similarly, classes in which the plenary session was seen tended to have significantly higher scores on the observed IEO 'Pedagogy' factors for both Literacy and Numeracy. Differences between groups were also found for a number of the individual items loading on this factor (see Appendix A Table A.10), thus indicating a more positive classroom climate in classes where children get the opportunity to review, reflect and consolidate

their learning. Absence of a plenary may indicate poorer planning or less classroom organisation, and less attention to the use of interactive whole class teaching, consolidation and review.

Further comparisons were made of classrooms where both Literacy and Numeracy plenaries were observed compared with those where no plenaries were observed. In all, just over a quarter of the teachers observed, used both Literacy and Numeracy plenaries while a similar proportion used neither (see Table 3). Data were available for 69 classes to make these comparisons.

Table 3: Comparison of use of Literacy plenary sessions by use of Numeracy plenary sessions

		Plenary Numeracy		Total
		No	Yes	
Plenary Literacy	No	19 27.5%	15 21.7%	34
	Yes	17 24.6%	18 26.1%	35
Total		36	33	69

Comparisons across all groups reveal a clear pattern of higher scores for those using both plenaries. The results indicate that there were significant differences in the ratings of 'Classroom Climate', 'Social support for student learning' and 'Instructional conversations' items in Literacy. Differences on a number of additional items approached significance; these included: 'Purposeful development of writing skills', 'Classroom Climate' and 'Social support for student learning' in Numeracy as well as on the Ofsted judgement of 'Improvement since last inspection'. On all measures the differences indicated that observed practice was rated most favourably in classes that used a plenary in both Literacy and Numeracy, and least favourably in classes where no plenary was used for either Literacy or Numeracy.

3.8 Summary of main findings from Section 3

IEO (Stipek) factors and the Quality measures

Teacher pedagogy

- School residuals for English were significantly and positively correlated with the Literacy 'Pedagogy' factor, and were also positively but weakly correlated with 'Pedagogy' in Numeracy.
- School residuals for Mathematics were significantly and positively correlated with 'Subject development' in Numeracy and were also positively but weakly associated with 'Pedagogy' in Literacy.
- Ofsted judgements of 'School effectiveness' were moderately but significantly and positively correlated with both the 'Pedagogy' and 'Subject development' factors in both Literacy and in Numeracy. These associations indicate that observed practice in year 5 tended to be rated more positively in schools that were more effective in promoting pupils' academic progress across Key Stage 2 and in those rated more favourably by inspectors.
- Ofsted judgements of 'Improvement since last inspection' were significantly and positively correlated with the 'Subject development' factor in Literacy, however, only the 'Purposeful development of writing skills' item of this cluster was correlated with 'Improvement since last inspection'. The correlation between the extent of school improvement identified by inspectors and this aspect of Literacy suggests that the most improved schools may have laid more emphasis on writing development.
- The Ofsted judgements of the quality of 'Teaching' and 'Learning' during KS1 were significantly and positively correlated with 'Subject development' in both curriculum areas.
- The quality of 'Teaching' and 'Learning' during KS2 was significantly correlated with 'Subject development' in Literacy but not Numeracy.
- There were significant positive associations between the 'Pedagogy' in Literacy factor and Ofsted judgements of pupils' 'Attitudes to school' and 'Attendance'.
- 'Pedagogy' in Literacy was significantly and negatively correlated with level of social disadvantage, measured by % FSM, suggesting that for Literacy the more general aspects of classroom pedagogy such as climate and routine are more sensitive to pupil context.

Leadership

- Ofsted judgement on school 'Leadership' was positively correlated with the 'Subject development' factor in Literacy and the 'Pedagogy' factor in Numeracy. These findings suggest that schools with more effective leaders tend to have better observed classroom practice in year 5 in several areas.

Literacy and Numeracy

- There was also a significant positive association between 'Subject Development' and 'Attendance' in Numeracy.
- In Numeracy it was the more specific aspects of Mathematics teaching, such as 'Depth of knowledge and student understanding', 'Maths discourse and communication', and 'Locus of Maths authority' that were more related to level of social disadvantage.
- Schools in which the Literacy plenary was observed were rated more favourably in many aspects.

COS-5 (Pianta) factors and the Quality measures

Teacher pedagogy

- 'Quality of pedagogy' was significantly and positively correlated with School residuals for Mathematics; and positively but weakly correlated with the Ofsted judgement 'School effectiveness'. These results suggest that there are links between the more global construct of school effectiveness as identified by inspectors, and specific aspects relating to the quality of teaching in specific classes.
- Pupils' 'Attitudes to school' were more favourably judged by Ofsted in schools where teachers were observed making 'Productive use of instructional time'. This suggests that pupils' attitudes to school are less positive where classroom organisation is poor and potential learning time is lost.

Classroom climate

- The factor 'Attention and Control' was significantly correlated with the Ofsted judgment of 'School effectiveness', suggesting that in schools judged to have made more improvement pupils are in classroom settings where they are more likely to be engaged with their work.
- The 'Child positivity' factor was significantly correlated with the Ofsted judgement of 'Improvement since last inspection'.

Classroom organisation

- The factor 'Disorganisation' was significantly and positively correlated with the percentage of pupils eligible for FSM. This supports the view that teaching in high disadvantage schools is likely to be more challenging due to poorer pupil behaviour.
- 'Disorganisation' was also negatively correlated with Ofsted judgement on pupil 'Attendance', this indicating poorer attendance in schools where classroom climate is judged more negatively.

SECTION 4: SUMMARY AND CONCLUSIONS

As part of the wider EPPE 3-11 research study, detailed classroom observations were conducted in 125 Year 5 classes in 2004 and 2005 using one or two (in a sub set of 93 classes) different research instruments developed in the US; but with additions to reflect features of the English education system. This paper provides an initial descriptive analysis of the results for each instrument and comparisons between the two instruments in 93 of these classes. It also investigates relationships with measures of school effectiveness and quality. The results reveal the existence of significant variation in observed patterns of child and teacher behaviour between different classes and schools in the sample and in pupils' responses. Children do not receive a common experience in Year 5 across these classes.

Overall, levels of student engagement are relatively high, and classroom climates positive. Teacher detachment is generally fairly low, but in a small number of classes this general pattern is not observed.

In terms of organisation the findings suggest that in a substantial proportion (around half) of Year 5 classes little use of the plenary session occurs in Literacy and Numeracy lessons. This is of some concern as this part of the lesson is intended to give opportunities for feedback and consolidate learning by the class. By missing this part of the lesson some teachers may be reducing the opportunity to provide such consolidation. In particular the use of more demanding higher order communication is typically more common in plenary sessions. The comparisons of observed practice in Literacy and Numeracy consistently indicated that better practice was more likely to be seen in lessons where teachers adopt a plenary in both Literacy and Numeracy; the lowest ratings were found for classes that did not use a plenary session in either subject.

There are indications that some aspects of teacher and pupil behaviour are associated with and appear to be influenced by the external context of the school; as defined by the level of social disadvantage of the intake. Pupil behaviour tends to be worse in schools where there are higher proportions of children eligible for free school meals. In addition, it appears that teaching quality is poorer in a number of aspects observed in classes where the school context is more disadvantaged. This may reflect the impact of more challenging pupil behaviour, lower teacher expectations and/or less experienced or capable teachers in such schools (since teacher recruitment and retention tends to be more problematic in such contexts). Further research to investigate the reasons for these associations and guidance on the improvement of practice in these contexts would be desirable.

The availability of recent inspection evidence for 102 of the 125 schools enabled an analysis of links between Ofsted inspectors' judgements of school quality in terms of effectiveness, improvement, leadership and overall teaching quality, and observed practice in Year 5 classes to be conducted.

The findings concerning patterns of positive associations between inspection judgements of quality and aspects of observed classroom practice, in Year 5 classes in 102 of the 125 schools for which recent inspection data was available, indicate that features such as 'School effectiveness', 'Leadership' and other areas are significantly if moderately associated with better observed practice. This suggests that school and teacher effectiveness are not independent, but teachers' classroom practice appears to be better if they teach in a school previously found to be of higher quality in terms of inspection

evidence. This may reflect the influence of better leadership, higher expectations, greater collaboration between teachers and consistency in approaches in more effective schools. These are key aspects that school effectiveness research and inspection evidence have identified as important in promoting better pupil outcomes (Sammons, 1999; Teddlie and Rynolds, 2000; Ofsted, 2000). The results support the view that the influence of the school on classroom practice needs to be studied further.

Additional analyses explored the relationships between measures of teacher and pupil behaviour in Year 5 classes and value added measures of overall school effectiveness (based on pupil progress measured using matched national assessment data from KS1 and KS2). A number of aspects of observed classroom practice in Year 5 classes were found to be significantly positively associated with the value added indicators of progress in Mathematics and English in Key Stage 2. Although only weak to moderate, such associations again point to links between overall school effectiveness and classroom practices. The correspondence between Ofsted ratings of quality and value added indicators with the classroom level observations gives confidence in the extent to which the different classroom observation instruments can identify important features of classroom practice in primary schools. These analyses help improve understanding of the variation in school and classroom processes and provide insights into more effective practice and pedagogical approaches.

Further analyses are being conducted to explore pupils' views and experiences measured by a questionnaire survey of children in the 125 Year 5 classes, including features of school and classroom climate. In addition, potential associations will be investigated between classroom climate and pupil progress for a sample of children in the 125 focal schools.

Key findings

Pedagogy

- The observational research identified significant variation in both teachers' classroom practice and pupils' behaviour in class and distinguished between better and poorer quality in the educational experiences for Year 5 pupils.
- Levels of student engagement were found to be relatively high and classroom climates were generally positive. Teacher detachment was generally low and there was less pupil 'off task' behaviour observed than in previous classroom studies conducted in the 1980s.
- There was, however, considerable variation in the quality of the classroom experiences of children in different Year 5 classes, indicating that some children attend poorer quality settings, which has implications for the promotion of greater equality of educational opportunities.
- Teachers varied in many aspects of their pedagogical practice and classroom organisation (for example the teaching of analysis skills and the extent of emphasis on basic skills) and several important features of observed practices (e.g. related to classroom climate, smooth organisational routines etc).
- Most teachers broadly followed the format of the National Strategies (Literacy and Maths) except for the use of the plenary which was not observed in nearly 50% of classes.
- The quality of teaching and pupil response was found to be consistently higher in classes where a plenary was used in both literacy and numeracy lessons and lowest in classes where no plenary was used in either subject.

The impact of School Context

- Incidence of poor pupil behaviour and classroom disorganisation was observed to be greater in schools with higher levels of social disadvantage, measured by the % of pupils eligible for free school meals (FSM).
- The quality of pedagogy was also found to be poorer in schools with higher levels of social disadvantage.

Associations between classroom practice and measures of 'effectiveness'

- Observed practice was found to be better in schools that had been rated more positively by Inspectors in earlier inspections (particularly in those schools rated more highly on overall leadership and school effectiveness). This suggests that the practice of Year 5 teachers in more effective schools is related to the overall quality of the school and its leadership.
- Significant positive associations were also found between Ofsted judgements of school effectiveness and improvement since the last inspection and teachers' use of a plenary in literacy and numeracy lessons.
- Several aspects of observed practice were also found to be weakly related to better value added outcomes in English and Maths.

Conclusions

This Report highlights new findings on the quality of teaching and learning in Year 5 English primary classes. The results are relevant to policy makers and practitioners concerned with improving practice and promoting greater equity by closing the attainment gap associated with social disadvantage. There are implications for the further development of the National Strategies and the results highlight areas of possible weakness in the teaching in some classes that could benefit from further guidance and professional development. The findings are of relevance to the Excellence and Enjoyment (DfES, 2003) agenda and the promotion of personalised learning. They are likely to be of interest to Ofsted inspectors and to schools' approaches to the improvement of classroom practice through self evaluation and review.

Key messages

There is wide variation in teachers' practice and children's responses in Year 5 classes and this is likely to affect pupils' educational outcomes.

- The quality of classroom practice is associated with the use of plenary sessions in literacy and numeracy lessons. Practice was found to be better in classes that used plenaries in both these subjects and poorer in classes where no plenary was observed in either but plenaries were present in only approximately half the Literacy or Numeracy lessons observed.

- The quality of Year 5 pedagogy and organisation and pupil behaviour is poorer in schools with higher levels of social disadvantage in their pupil intakes. This may reflect lower expectations, difficulties in recruiting/retaining good/experienced teacher and the greater behavioural difficulties associated with teaching in more challenging contexts. The quality of Year 5 practice observed was better in schools that had been rated more highly in terms of overall school leadership, effectiveness and improvement on the previous inspection. Such schools appear to provide a more positive context for teaching and learning.

- The use of well researched classroom observation instruments may provide valuable evidence for teachers' professional development and support a school's self evaluation and review process. This is particularly relevant where they identify quality across a range of features of teaching and learning that are linked with better outcomes for children.

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Appendix A

Table A.1: Comparisons between mean effectiveness measures and Ofsted judgements

	English Mean 2003 and 2004	Mathematics Mean 2003 and 2004	Science Mean 2003 and 2004
School effectiveness (n=106)	.29**	.37**	.37**
Improvement since last inspection (n=101)	.29**	.34**	.39**
Teaching KS1 (n= 79)	.20	.29*	.28*
Teaching KS2 (n=101)	.32**	.39**	.34**
Learning KS1 (n= 79)	.23*	.31**	.31**
Learning KS2 (n=101)	.27**	.39**	.39**
Ongoing assessment (n=104)	.34**	.30**	.26*
Leadership (n=104)	.26**	.34**	.36**
Behaviour including exclusions (n=104)	.28**	.33**	.28**
Attitudes to school (n=104)	.20*	.29**	.25*

** Correlation is significant at the 0.01 level (2-tailed);
* Correlation is significant at the 0.05 level (2-tailed).

Table A.2: Associations between the COS-5 child and classroom factors and school characteristics

School level characteristics	COS–5 (Pianta) - Child and Classroom factors				
	Quality of Pedagogy	Disorganisation	Child positivity	Positive engagement	Attention and Control
%FSM (n=125)		0.36**			
Ofsted School effectiveness (n=107)	*0.18 p<0.06*				0.20*
Ofsted Improvement since last inspection (n=107)			0.21*		
Math value added residual (n=123)	0.20*				

** Correlation is significant at the 0.01 level (2-tailed);
* Correlation is significant at the 0.05 level (2-tailed).

Table A.3: Association between COS-5 child codes and school characteristics

School level characteristics	COS-5 (Pianta)- Child classroom behaviour codes						
	Positive affect	Self-reliance	Sociable/ co-operative with peers	Attention	Disruptive	Activity level	Child-Teacher Relation-ship
%FSM (n=125)					0.34**		
Ofsted School effectiveness (n=107)	0.19*	0.36**		0.26**			
Ofsted Improvement since last inspection (n=102)	0.20*	0.39**		0.24*			
Ofsted Leadership (n=105)	0.20*			0.22*			
Ofsted Teaching KS2 (n-102)		0.20*					
Ofsted Learning KS2 (n-102)		0.20*					
Mathematics value added Residual (n=123)		0.18* (p=0.051)					

** Correlation is significant at the 0.01 level (2-tailed);
* Correlation is significant at the 0.05 level (2-tailed).

Table A.4: Association between classroom codes and school characteristics

School level characteristics	COS-5 (Pianta) - Classroom codes								
	Richness of instru-ctional methods	Over control	Chaos	Detach-ment/ Teacher	Positive classroom climate	Negative classroom climate	Productive use of instruct-ional time	Evaluative feedback	Teacher sensitivity
%FSM (n=125)		0.19*	0.27**		- 0.33**	0.42**	- 0.21*		- 0.25**
Ofsted School effectiveness (n=107)	0.23*			-0.25**	0.23**		0.27**		
Ofsted Improvement (n=102)				-0.24**	0.20**		0.21*		
Ofsted Teaching KS1 (n=102)	0.24*								
Mathematics value added residual (n=123)	0.20*			-0.20*		-0.20*		0.24**	0.23*

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed)

Table A.5: Association between classroom codes and school characteristics

Ofsted judgements on pupil outcomes	COS -5 (Pianta) - Classroom codes							
	Richness of instruct-ional methods	Over control	Chaos	Detachment /Teacher	Positive classroom climate	Negative classroom climate	Productive use of instructiona l time	Teacher sensitivit y
Behaviour including exclusion (n=102)								
Attitudes to school (n=102)			- 0.20*				0.24*	
Attendance (n=102)			-0.30**		0.22*	- 0.26**	0.20*	

** Correlation is significant at the 0.01 level (2-tailed);
* Correlation is significant at the 0.05 level (2-tailed).

Table A.6: Association between the Stipek factors and school characteristics

School level characteristics	IEO (Stipek) - Literacy factors			IEO (Stipek) - Numeracy factors		
	Pedagogy	Subject development	Learning linkages	Pedagogy	Subject development	Learning linkages
%FSM (n=91)	-0.36**				-0.23*	
Ofsted School effectiveness (n=80)	0.24*	0.25*		0.25*	0.22*	
Ofsted Improvement (n=76)		0.27*				
Ofsted Leadership (n=81)		0.28*		0.23*		
Ofsted Teaching KS1 (n=61)		0.27*			0.27*	
Ofsted Learning KS1 (n=79)		0.29*			0.29*	
Ofsted Teaching KS2 (n=61)		0.24*				
Ofsted Learning KS2 (n=79)		0.23*				
Attitude (n=81)	0.24*					
Attendance (n=81)	0.23*				0.30**	
Mathematics value added Residuals (n=83)	0.20 (p=0.075)				0.26*	
English value added Residuals (n=83)	0.24*			0.18 (p=0.096)		

** Correlation is significant at the 0.01 level (2-tailed);
* Correlation is significant at the 0.05 level (2-tailed).

Table A.7: Association between IEO (Stipek) Literacy items and school characteristics

School level characteristics	IEO (Stipek) – Literacy items							
	Classroom Climate	Classroom Routine	Cross-Disciplinary connect-ions	Student Engage-ment	Social support for learning	Reading as meaning making *N=43*	Purposeful develop-ment of writing *n=43*	Instructional conversation
%FSM (n=93)	-0.31**	- 0.24*		-0.28**	-0.33**			
Ofsted Effectiveness (n=81)	0.27*	0.33**	0.31**				0.41**	0.22*
Ofsted Improvement (n=77)							0.38**	
Ofsted Leadership (n=82)		0.33**	0.31**	0.22*			0.41**	
Ofsted Ongoing Assessment (n=69)	0.30*	0.26**	0.24*			0.40**	0.25*	
Ofsted Teaching KS1 (n=62)		0.26*	0.28*	0.22*			0.34**	
Ofsted Learning KS1 (n=62)		0.26*		-0.28			0.38**	
Ofsted Teaching KS2 (n=80)		0.25*	0.25*				0.28*	
Ofsted Learning KS2 (n-80)			0.25*					
Mathematics value added Residuals (n-91)		0.30**						
English value added Residuals (n-91)	0.24*	0.29**				0.28 (p=0.054)		

** Correlation is significant at the 0.01 level (2-tailed);
* Correlation is significant at the 0.05 level (2-tailed).

Table A.8: Association between IEO Stipek Numeracy items and school characteristics

School level characteristics	IEO (Stipek) - Numeracy items						
	Classroom Climate	Classroom Routine	Student Engagement	Cross Disciplinary connections	Use of Maths Analysis	Depth of knowledge and student understanding	Locus of Maths authority
% FSM (n=93)	-0.21*	-0.22*				-0.26*	-0.35**
Ofsted Effectiveness (n=81)	0.31**	0.36**	0.27*		0.28*	0.26*	0.24*
Ofsted Improvement (n=77)							
Ofsted Leadership (n=82)	0.22*	0.33**			0.23*		0.29*
Ofsted Ongoing Assessment (n=69)					0.25*		
Ofsted Teaching KS1 (n=62)		0.27*			0.38**	0.26*	0.26*
Ofsted Learning KS1 (n=62)	0.24*				0.41**		
Ofsted Teaching KS2 (n=80)		0.26*			0.32**		
Ofsted Learning KS2 (n=80)		0.23*		0.24*	0.31**		
Maths value added Residuals (n-90)		0.19 (p=0.071)			0.24*	0.20 (p=0.065)	0.27**
English value added Residuals (n-90)	0.22*	0.24*	0.19 (p=0.076)				

School level characteristics	IEO (Stipek) – Numeracy items		
	Social support for learning	Basic skill development in the context of problem solving	Maths discourse and communication
%FSM (n=93)	-0.21*	-0.21*	-0.28*

** Correlation is significant at the 0.01 level (2-tailed);

* Correlation is significant at the 0.05 level (2-tailed).

Table A.9: Association between IEO (Stipek) Numeracy items codes and Ofsted pupil outcome measures

Subject level judgements on pupil outcomes	IEO (Stipek) – Numeracy items							
	Classroom Climate	Classroom Routine	Social support	Use of Maths Analysis	Depth of knowledge and student understanding	Basic skill development in the context of problem solving	Maths discourse and communication	Locus of Maths authority
Behaviour including exclusion (n=82)	0.22*	0.27*		0.24*				
Attitudes to school (n=82)	0.25*	0.28*		0.24*				0.24*
Attendance (n=82)			0.27*	0.31**	0.24*	0.29**	0.25*	0.27**

** Correlation is significant at the 0.01 level (2-tailed);
* Correlation is significant at the 0.05 level (2-tailed).

Table A.10: Differences in practice between classes where plenary sessions were used and those where no plenary session was used on individual IEO items

N=	t	Df	Sig (2-tailed)	Mean Difference	Sd
Literacy Classroom Climate	-3.434	67	.001	-.755	.220
Literacy Classroom Routines	-2.223	66	.030	-.640	.288
Literacy Social support for student learning	-3.506	67	.001	-.821	.234
Literacy Student Engagement	-1.922	67	.059	-.381	.198
Literacy Reading as meaning making	-2.677	35	.011	-.924	.345
Literacy Purposeful development of writing skills	-2.427	63	.018	-.889	.366
Literacy Instructional conversations	-2.731	66	.008	-.722	.264
Numeracy Classroom Climate	-2.218	66	.030	-.599	.270
Numeracy Classroom Routines	-1.791	66	.078	-.554	.309
Numeracy Social support for Student Learning	-2.360	67	.021	-.592	.251

Appendix B

Example of suggested outline of the Literacy Hour from the National Literacy Strategy:

- Whole class (15 minutes): Shared text work (balance of reading and writing).
- Whole class (15 minutes): Focused word work (balance over term of focused word or sentence work).
- Group and Independent work (20 minutes): independent reading, writing or word work, while teacher works with at least two ability groups each day on guided reading.
- Whole class (10 minutes): Plenary – review, reflect, consolidate teaching points and presenting work covered in the lessons (DfES, 2001a).

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