Effective Pre-School, Primary and Secondary Education Project
EPPSE (1997 – 2013)

Effective Pedagogy in Primary Schools in English and Maths (Sub-study EPPSEM)

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A Longitudinal Study Funded by the DFES

What can the EPPSE project tell us about factors and influences in raising pupils' standards especially in English and Maths?

❖**Background to EPPSE as a research programme**

❖**What can EPPSE tell us about effective primary pedagogy, finding from:**

quantitative analyses of observations in 125 Year 5 classrooms

qualitative analyses of the Effective Primary Pedagogical Strategies in English and Maths (EPPSEM) project

The EPPSE Project

The Research Aims – to examine the

- impact of different types of pre, primary and secondary schooling on children's cognitive and social/behavioural development

- structural and process characteristics of more effective pre, primary and secondary schools

- interaction between child, family and home learning characteristics and child outcomes.

- The EPPSE research has a special interest in issues of equity and equality in particular how early experiences impact on child's later life chances.

Sources of data, so far

- **Child assessment (social/behaviour & cognitive) at 3, 4+, 6, 7, 10 ,11 & 14 & 16 years (+ post 16 destinations in 2011)**

- **Family background at 3, 6 and 11 & 14**

- **Interviews/questionnaires with staff**

- **'Quality' rating scales in pre-school**

- **Case studies of effective pre-school settings**

- **Measures of primary school academic effectiveness (value added)**

- **Pedagogical observations in primary school**

- **School and classroom climate questionnaires**

- **Children's views of school at age 7, 10, 14 and 16.**

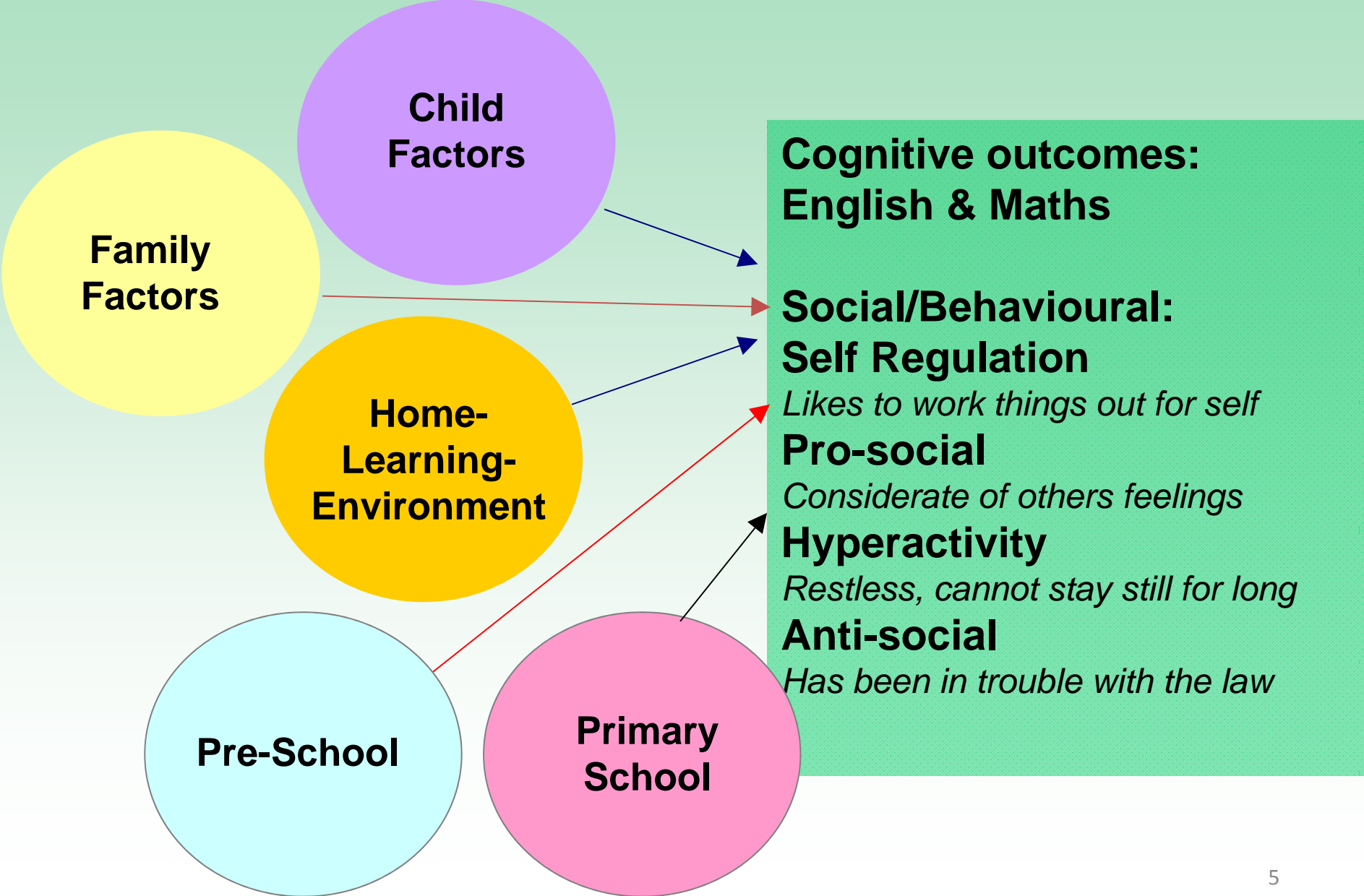- **Teachers' views on school processes and practice in Yr 5 & Yr 9**

EPPSE explores how child, family and home characteristics relate to children's cognitive and social/behavioural development.

It also focuses on the continuing impact of pre-school as well as the importance of primary and secondary school experiences.

EPPSE looks at both 'in school' and 'out of school' learning opportunities.

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Different influences on child outcomes

Child Factors

Family Factors

Home-Learning-Environment

Pre-School

Primary School

Cognitive outcomes: English & Maths

Social/Behavioural: Self Regulation

Likes to work things out for self

Pro-social

Considerate of others feelings

Hyperactivity

Restless, cannot stay still for long

Anti-social

Has been in trouble with the law

EPPE/EPPSE a programme of research

EPPE   (1997 – 2003) focus on pre-school.
EPPE 3-11   (2003 – 2008) focus on primary school.
EPPSE 3 -14   (2008 – 2011) focus on secondary school
EPPSE 3-16+ (2011 – 2013) focus on post 16 destinations.

The expanded programme of research: EPPSE has also studied:
•Special Educational Needs
•The Home Learning Environment at different time points
•Pedagogy in pre-school and primary school
•Transitions from primary to secondary school
•Children who succeed against the odds
•Resilience and vulnerability
•Learning trajectories
•Pupil mobility
•Pupils' perceptions and views of school
•Effective pre-schooling in Northern Ireland (EPPNI study)

Observations and Instruments

Year	COS-5 (Pianta) observations	IEO (Stipek) observations
2004 (Spring/Summer)	54	24
2005 (Spring/Summer)	71	69
Total	125	93

Criteria for selection:

- **school VA effectiveness (equal numbers of effective and ineffective schools based on school VA residuals, across years and subject)**
- **number of EPPE children in the school (4 or more).**

Instruments:

- **Classroom Observation System for Fifth Grade (COS-5, Pianta, NICHD, 2001). Pianta, 2001 (NICHD)**
- **Instructional Environment Observation Scales (IEO, Stipek, 1999)**

Quant. Data Summary

- Teachers varied in their pedagogical practice and classroom organisation (e.g. the teaching of analysis skills and the extent of emphasis on basic skills) and important features of observed practices (e.g. classroom climate, routines etc).

- Observed quality was highest in classes with a plenary in literacy and mathematics and lowest in classes where no plenary was used in either subject.

- Children's experiences vary markedly in terms of richness of instruction, time spent on teaching/learning basic skills, higher order skills of analysis and in unproductive or 'off task' behaviour and classroom climate.

- Poorer quality pedagogy and poorer pupil behaviour and classroom organisation were associated with disadvantaged school contexts.

Quant. Data Implications

Quality of school and classroom teaching matters for children's cognitive progress in reading and maths and for social behavioural outcomes also.

Initiatives that place a stronger emphasis on:

• *promoting the overall quality of teaching and*

• *fostering a more orderly classroom climate*

are likely to improve educational outcomes for all children and may be particularly important for schools with higher proportions of disadvantaged children.

Some schools provide a better context for effective teaching as shown by the findings related to Ofsted inspection results.
Children made more progress if they attended schools judged to be more effective or more improved

EPPSEM sub-study -What is pedagogy?

Gage (1985) defined pedagogy as- "the science of the art of teaching"

Pedagogy refers to "the instructional techniques and strategies which enable learning to take place. It refers to the interactive process between teacher/practitioner and learner, and it is also applied to include the provision of some aspects of the learning environment (including the concrete learning environment, and the actions of the family and community)" (Siraj-Blatchford et al., 2002:10)

What do we mean by 'effectiveness'?

"Primary schools where children make significantly greater progress than predicted on the basis of prior attainment and intake characteristics can be views as *more effective* (positive outliers in value added terms). Primary schools where children make less progress than predicted can be viewed as *less effective* (negative outliers in value added terms)" (Melhuish et al., 2006:4)
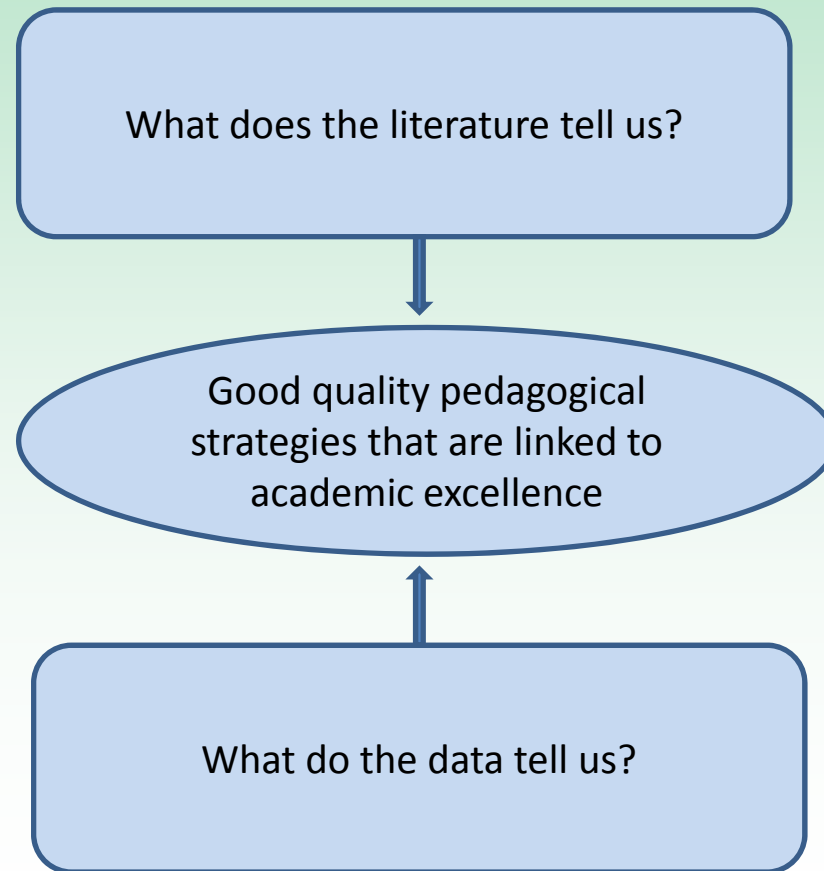
Research questions

The purpose of the EPPSEM study was to analyse effective pedagogical strategies in English and Maths in Key Stage 2. Specifically, the study identifies:

- the specific teaching behaviours in Year 5 classrooms associated with more or less effective impact on student outcomes using the detailed observations of Year 5 Literacy and Numeracy classroom practices in 125 classes (93 schools, 82 with complete data sets) during the spring and summer terms of 2004 and 2005.

- which were the most and least effective lessons and then analyse the lesson plans, the interaction within lessons, teacher-pupil dialogue, and issues of (dis)organisation and behaviour.

EPPSEM Design

The research question was approached from two directions:

What does the literature tell us?

Good quality pedagogical strategies that are linked to academic excellence

What do the data tell us?

Sample

Of the 125 schools in the previous presentation, 82 had full data sets and so were selected for the EPPSEM study. These schools had a range of academic effectiveness and level of pupil disadvantage (measured by percentage of pupils eligible for free school meals (FSM) and were from a variety of contexts (inner city, shire and rural).

The pilot study

Initially, a pilot study was carried out using the eight most academically effective schools with the highest ratings on quality of pedagogy. This study:

- ❖ confirmed that the list of pedagogical strategies that had been compiled was complete from the literature review and professional focal group discussions
- ❖ provided a first glance at the differences in the *pedagogical strategies* used and learning environment in these classrooms compared with those in schools with the poorest ratings on academic effectiveness and quality of pedagogy.

Method – the EPPSEM study

Sample

Year 5 classrooms in three groups of 'typical' schools were identified:

1. schools with high academic effectiveness and good quality of pedagogy (excellent schools; the pilot study schools)

2. schools with medium academic effectiveness and quality of pedagogy (good schools)

3. schools with low academic effectiveness and poor quality of pedagogy (poor schools)

COS-5 Classroom Observations

- **Child behaviour codes**

  1. Positive affect
  2. Self-reliance
  3. Sociable/Co-operative with peers
  4. Attention
  5. Disruptive
  6. Activity level
  7. Child-Teacher relationship

Classroom Codes

  1. Richness of instructional methods
  2. Over-control
  3. Chaos
  4. Detachment/Teacher
  5. Positive classroom climate
  6. Negative climate
  7. Purposeful use of instructional time
  8. Teacher sensitivity

IEO (Stipek) Instructional Environment Observation Scales

Literacy   **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

Literacy	Numeracy
7. Reading as meaning making	7. Use of maths analysis
8. Higher order thinking in writing	8. Depth of knowledge and understanding
9. Basic skills development in the context of reading	9. Basic skill development in the context of problem solving
10. Purposeful development of writing skills	10. Maths discourse and communication
11. Instructional conversations.	11. Locus of maths authority

Classroom Observation Survey
Underlying Dimensions

- **Five factors accounted for 76% of the variance in the 16 individual item scores**

Factor 1: Quality of pedagogy

- Classroom codes – Rich instructional methods
- Classroom codes - Teacher detachment
- Classroom codes - Positive climate
- Classroom codes - Productive use of time
- Classroom codes - Evaluative feedback
- Classroom codes - Teacher sensitivity

Factor 2: Disorganisation

- Child code – Disruptive
- Classroom codes – Chaos
- Classroom codes - Negative climate

Factor 3: Child positivity

- Child code – Self-reliance
- Child code - Co-operation with peers
- Child code - Child-Teacher relations

Factor 4: Positive engagement

- Child code - Positive affect
- Child code – Activity level

Factor 5: Attention and control

- Child code - Attention
- Classroom codes - Over control
- Child code - Activity level

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Instructional Environment Observations
Underlying Dimensions

Literacy Lesson

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

Explaining 73% of the variance

Numeracy Lesson

Subject development

1. Use of Maths analysis
2. Depth of knowledge and understanding
3. Basic skill development(problem-solving)
4. Maths discourse and communication
5. Locus of Maths authority

Pedagogy

1. Classroom climate
2. Classroom routines
3. Social support for student learning
4. Student engagement

Learning linkages

1. Cross-disciplinary connections
2. Linkage to life beyond the classroom

Explaining 76% of the variance

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Sample – Year 5 classrooms in schools with high academic effectiveness and good quality of pedagogy (excellent schools)

Group 1: Year 5 classrooms in schools with high academic effectiveness and good quality of pedagogy (n=10)

School	IEO[1]	COS-5[1]	Maths[2]	English[2]	FSM (%)
S01	3	5	3	4	0
S02	3	3	5	4	22
S03	2	5	4	4	32
S04	3	4	3	5	16
S05	3	4	4	4	12
S06	3	4	3	4	31
S07	3	3	5	3	3
S08	3	4	3	4	18
S12	3	3	3	4	31
S13	3	4	4	3	49z

1. Instrument used to measure quality of pedagogy. A higher score indicates better quality pedagogy. Scores range from 1 to 3 on the IEO and from 1 to 5 on the COS-5. These instruments are explained later in the presentation.
2. Measure of academic effectiveness. A higher score indicates higher effectiveness. Scores range from 1 to 5.

Sample – Year 5 classrooms in schools with medium academic effectiveness and quality of pedagogy (good schools)

Group 2: Year 5 classrooms in schools with medium academic effectiveness and quality of pedagogy (n=9)

School	IEO[1]	COS-5[1]	Maths[2]	English[2]	FSM (%)
S25	2	3	3	3	7
S26	2	3	3	3	11
S27	2	3	3	3	5
S28	2	3	3	3	3
S29	2	3	3	3	19
S30	2	3	3	3	35
S31	2	3	3	3	15
S32	2	3	3	3	9
S36	2	3	3	3	14

1. Instrument used to measure quality of pedagogy. A higher score indicates better quality pedagogy. Scores range from 1 to 3 on the IEO and from 1 to 5 on the COS-5. These instruments are explained later in the presentation.
2. Measure of academic effectiveness. A higher score indicates higher effectiveness. Scores range from 1 to 5.

Sample – Year 5 classrooms in schools with low academic effectiveness and poor quality of pedagogy (poor schools)

Group 3: Year 5 classrooms in schools with low academic effectiveness and poor quality of pedagogy (n=10)

School	IEO[1]	COS-5[1]	Maths[2]	English[2]	FSM (%)
S73	1	3	2	3	8
S74	2	3	2	2	10
S75	2	3	2	2	39
S76	1	1	1	2	53
S77	2	1	2	2	12
S78	2	1	3	2	13
S79	2	3	2	2	39
S80	1	2	2	1	40
S81	1	1	2	3	15
S82	1	1	3	2	16

1. Instrument used to measure quality of pedagogy. A higher score indicates better quality pedagogy. Scores range from 1 to 3 on the IEO and from 1 to 5 on the COS-5. These instruments are explained later in the presentation.
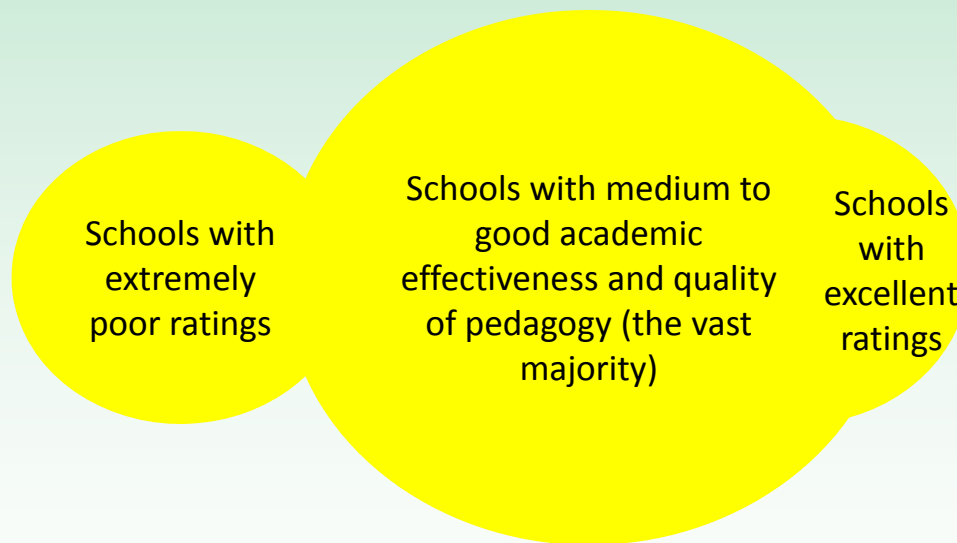2. Measure of academic effectiveness. A higher score indicates higher effectiveness. Scores range from 1 to 5.

The pedagogical strategies

1. **Organisation**
2. **Clear, shared objectives**
3. **Homework***
4. **Classroom climate**
5. **Behaviour Management**
6. **Collaborative learning**

7. **Personalised teaching and learning**
8. **Making links explicit**
9. **Dialogic teaching and learning**
10. **Assessment for learning (AfL)**
11. **Plenary***

* Although these are highlighted in the literature as potentially important aspects of teaching and learning, they were not systematically recorded during the initial observations (although recording the presence/absence of a plenary was part of the second year of observations). The use of homework was not systematically recorded on the COS-5 or the IEO. This meant that the analysis and discussion of these two items depended, to a great deal, on whether or not they happened to be mentioned in the observation reports.

Findings

Despite initially expecting to find three separate groups of excellent, good and poor schools we found the good and excellent schools overlapped considerably.

Schools with extremely poor ratings

Schools with medium to good academic effectiveness and quality of pedagogy (the vast majority)

Schools with excellent ratings

Key Findings

There were significant differences in the strategies used by Year 5 teachers in academically effective schools with good quality pedagogy (excellent schools) and those used by Year 5 teachers in schools with medium effectiveness and quality pedagogy (good schools) and in schools with low academic effectiveness and poor quality pedagogy (poor schools).

Teachers in excellent schools:

- Have excellent organisational skills:

    share clear learning objectives with their pupils, ensure all pupils understand objectives and associated concepts, have extremely well-organised resources and well-established classroom routines.

- Establish a positive classroom climate:

    relationships between children and between adults and children are characterised by a sense of liking and mutual respect, classrooms are happy places, children are less disruptive and behaviour management is handled sensitively.

- Personalise their teaching:

  teachers are sensitive to the needs and interests of their pupils, provide a variety of resources to suit the individuals in their classes, are more likely to make explicit the links between learning in the classroom and the world outside the classroom and provide homework directly linked to what children are learning in their lessons.

- Use dialogic teaching and learning, especially for Numeracy:

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

- Make more frequent and better use of the plenary:

  teachers are about twice as likely to use a plenary and they use it to provide feedback and to allow further discussion, exploration and extension.

Summary findings:
High quality pedagogy includes

Organisation

Teachers have high quality resources that are well-planned and specifically adapted to meet the needs of their pupils. Their classroom routines are well-established and expectations are clear. Children in these classrooms are self-reliant.

Shared Goals

Children are clear about the learning intentions of each activity and teachers ensure that concepts and ideas are clear to all pupils.

Classroom Climate

Children feel safe, valued and are highly engaged in their learning. Teachers are involved with the children and there is a sense of mutual affection and respect between all members of the class.

Summary findings:
High quality pedagogy includes

Behaviour Management

Behaviour is managed through expectation and involving children in their learning. Chaos is kept to a minimum.

Collaborative Learning

Our findings reflect what is found in the literature: teachers rarely provide collaborative learning opportunities. Teachers in schools with high academic effectiveness and good quality of pedagogy, however, used collaborative learning more frequently than teachers in other schools.   Children in these schools were accustomed to working collaboratively to generate and discuss ideas and to provide feedback for each other.

Personalised Learning

Teachers are especially sensitive to the needs of their pupils and adapt their teaching styles and resources to meet these needs.

Summary findings:
High quality pedagogy includes

Making Links Explicit

Teachers consistently make the links between the current topic and other subjects and to life outside the classroom / school explicit so that their pupils can appreciate the wider implications of their learning.

Dialogic Teaching and Learning

Teachers are concerned with their pupils' in-depth understanding and children in their classes spend more time learning and practising analysis. The type of questioning and level of discussion are geared towards a profound and insightful grasp of a topic.

Assessment for Learning

Teachers provide realistic evaluative feedback to their pupils and opportunities for their pupils to reflect on their learning.

Summary findings:
High quality pedagogy includes

Plenary

Although the plenary was not present in every lesson, teachers used planned plenary sessions to consolidate learning, provide opportunities for feedback and to extend ideas presented in the lesson.

Homework

Teachers provided homework that children were intrinsically motivated to complete and that extended their classroom learning.

Summary of the distinction between good and excellent pedagogy

In schools with high academic effectiveness and highest quality of pedagogy we had what was in the above four slides plus:

1. The class teacher's resources were well prepared, organised and adapted to the learning objectives and to suit the specific needs of the pupils within the class.
2. Every second counts – absolutely no time was wasted!
3. The classroom climate was extremely positive. Children felt safe, the relationships between adults and children were supportive and these classrooms had an industrious buzz of activity.
4. Teachers were "tuned in" and sensitive to the needs of their pupils.
5. Children were liked and respected by their peers.
6. Teachers sometimes made cross curricular links and links to life outside the classroom explicit.
7. Children had opportunities to reflect on their learning.

Findings

Although numerical ratings were available for many of the characteristics of the pedagogical strategies, the data are mainly qualitative in nature and so descriptive terms were more appropriate when reporting findings. When numerical scales were available, they were reported as:

Numerical Rating	Description
Highest rating(s) on scale	Very high
Ratings in between the highest and the middle rating	High
Middle rating on scale	Medium
Ratings in between the lowest and middle rating	Low
Lowest rating(s) on scale	Very low

Findings* - Organisation

Characteristics of Year 5 classrooms in . . .	Excellent Schools	Good Schools	Poor Schools
Productive use of instructional time	Very High	High	Medium
Teacher's resources are well-organised and fit for purpose	Excellent**	Very High	High
Children's self-reliance	High	Medium	Medium
Teacher's expectations are clear	Very High	Very High	High
Time children spend on transitions/ management/ business	Very Low***	Very Low***	Low***
Classroom routines	Very High***	High***	Medium
Children are responsible for time and resources	Medium	Medium	Low

*   Unless otherwise stated, different qualitative descriptions indicate significant differences ($p<.05$) between groups.

**   As the mean score for the excellent schools was equal to the maximum score on this item, and as it was significantly higher than the mean score for the good schools, the additional qualitative description "excellent" was used for this one item.

*** Difference between these groups was not significant

Findings - Organisation

- Teachers in excellent and good schools wasted no time. They were rated highly on the efficiency and smoothness of their classroom routines and children in these classes were responsible for their own time and resources: they knew what to do and they did it.

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

Findings* - Clear, shared objectives

Characteristics of Year 5 classrooms in . . .	Excellent Schools	Good Schools	Poor Schools
The learning intentions of the lesson or activity are clear to all children	Very Good	Good**	Good**
The teacher ensures concepts and ideas are clear to all children	Very Good	Very Good	Good

*   Unless otherwise stated, different qualitative descriptions indicate significant differences (p<.05)

**   Year 5 teachers in good schools were rated significantly higher than those in poor schools.

Findings – Clear, shared objectives

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

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

Findings* – Personalised teaching and learning

Characteristics of Year 5 classrooms in . . .	Excellent schools	Good schools	Poor schools
Teacher detachment	Very Low	Very Low	Low
Teacher sensitivity	Very High	High	Medium
Social support for learning in Literacy	High	High	Medium
Richness and variety of instructional material	High	Medium	Low

*   Unless otherwise stated, differences in qualitative descriptions indicate significant differences (p<.05) between the groups.

Findings – Personalised teaching and learning

Teachers in excellent and good schools were more likely to personalised their pupils' learning experiences. They did this by being sensitive to the individual needs of the children in their classes and by providing learning materials that were rich and varied. They were rated as very low in teacher detachment and high when providing social support for student learning in literacy. Teachers in excellent schools were exceptionally sensitive to the needs of the children in their classes and provided outstanding learning materials.

Findings* – dialogic teaching and learning: Communication

Characteristics of Year 5 classrooms in . . .	Excellent schools	Good schools	Poor schools
Instructional conversations in Literacy	Very High	High**	Medium**
Maths discourse and communications	High	High	Low

*   Unless otherwise stated, differences in qualitative descriptions indicate significant differences (p<.05) between groups.

**   Difference is not significant.`

Findings – dialogic teaching and learning

The extent of dialogic teaching showed few differences between the three groups, except in Numeracy where teachers in excellent schools received the highest ratings on using dialogic teaching and learning (p<.05).   Teachers in excellent and good schools were rated significantly higher on using analysis, the depth of their pupils' knowledge and understanding, maths discussion and communication and sharing the locus of maths authority with the children. In Literacy, teachers in excellent schools were also rated higher on instructional conversations.

Findings – dialogic teaching and learning

- Teachers in excellent and good schools were rated significantly higher on dialogic teaching for their use of analysis in maths and in the depth of their pupils' knowledge and understanding. They were also rated more highly on maths discussion and communication and on sharing the locus of Maths authority. In Literacy, they were rated higher on instructional conversations.

- The extent of dialogic teaching and learning showed few differences between the three groups, except for Numeracy, where teachers in excellent schools received the highest ratings on using dialogic teaching and learning ($p<.05$).

For further information about EPPSE visit our website at:

http://eppe.ioe.ac.uk

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