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INTERIM REPORTS

Research Survey 9/2

CLASSES, GROUPS AND TRANSITIONS: STRUCTURES FOR TEACHING AND LEARNING

Peter Blatchford, Susan Hallam,
Judith Ireson and Peter Kutnick,
with Andrea Creech
Institute of Education and King's College
University of London

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This is one of a series of 32 interim reports from the Primary Review, an independent enquiry into the condition and future of primary education in England. The Review was launched in October 2006 and will publish its final report in late 2008.

The Primary Review, supported by Esmée Fairbairn Foundation, is based at the University of Cambridge Faculty of Education and directed by Robin Alexander.

A briefing which summarises key issues from this report has also been published. The report and briefing are available electronically at the Primary Review website: **www.primaryreview.org.uk**. The website also contains Information about other reports in this series and about the Primary Review as a whole.

We want this report to contribute to the debate about English primary education, so we would welcome readers' comments on anything it contains. Please write to: **evidence@primaryreview.org.uk** .

The report forms part of the Review's research survey strand, which consists of thirty specially-commissioned surveys of published research and other evidence relating to the Review's ten themes. The themes and reports are listed in Appendices 1 and 3.

This survey relates to Primary Review theme 9, **Structures and Phases**.

The authors: Peter Blatchford is Professor of Psychology and Education at the Institute of Education, University of London. Susan Hallam is Professor of Education at the Institute of Education, University of London. Judith Ireson is Professor of Psychology in Education at the Institute of Education, University of London. Peter Kutnick is Professor of Psychology and Education at King's College, University of London. Andrea Creech is Research Officer at the Institute of Education, University of London.

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CLASSES, GROUPS AND TRANSITIONS: STRUCTURES FOR TEACHING AND LEARNING

Abstract

This report surveys recent research, mainly in the UK, to explore different school and class grouping arrangements, the factors influencing them, and their impact on pupil learning and adjustment in the primary phase. It distinguishes between grouping at the class and within-class levels, and argues that the latter is likely to be more important for pupils' educational attainments, behaviour and attitudes to schooling. The report also surveys research on problems of coherence, transitions and continuity within and between phases, and evidence on the educational benefits of small classes.

INTRODUCTION

In this report we are interested in ways in which pupils are organised into classes and into groups within classes, and whether transitions into, within and from the primary sector influence classroom teaching and pupil's progress. Educational reform as it relates to primary schools has primarily, and certainly since the Education Reform Act of 1988, been concerned with curriculum and assessment arrangements. In this review we argue that teaching and learning in schools take place in distinctive social contexts – classrooms and groups – that need to be recognised and studied carefully because of the effect they have on teaching and learning. Although some theorists, for example Bronfenbrenner (1979) and Doyle (1986), have been influential in identifying the contextual basis for school learning, there is still a strong tendency to see teaching, learning and classroom management in a kind of vacuum, separate from the school organisational contexts within which they are situated. At the same time, opinions can sometimes be strongly put, for example about grouping in schools, with many politicians at least now favouring some version of same-ability groupings, whether at the class or within-class level. There are also very strongly held views about the benefits of small classes in schools. But there are many complexities involved that require us to take an objective look at the research evidence available.

Much of this survey will cover research connected to grouping strategies in schools. It may be worth saying at the outset that we have considered this work at two main levels – the first concerns grouping at the class or school level and the second concerns pupil grouping within the classroom. With regard to the first level, various strategies have been used to group pupils into year groups, forms, and subject teaching groups. Throughout the survey we refer to this type of grouping as 'structured/organisational grouping'. Topics covered include setting and streaming, mixed-ability and same-ability classes. The nature and composition of such groups has been the source of heated debates for many years. These debates have sometimes been unhelpfully polemical with arguments raging between those defending ability grouping and those promoting mixed-ability teaching. The reality is more complex and less clear, and we aim to achieve a balanced account of what we know about grouping at this level, highlighting the reasons why schools adopt particular forms of grouping, and the impact of different forms of grouping on teaching and on pupil learning and attainment. But we also consider grouping in a second way, that is groupings within classes. A focus on grouping at the class or school level may obscure what is happening in the groups within the class, in relation to teaching, learning and attitudes. One theme to emerge from our review, which we might state at this early point, is that implications for practice are evident at both levels but perhaps clearer for the second compared to the first level. Another theme to

emerge is that there is a gap between current practice and the potential for using pupil groups to enhance pupil learning while in school. Further, the literature on transitions also emphasises differences in within-classroom processes between phases and years that may affect the child's move from one setting to another.

The approach of this survey

Given that research in a number of areas covered in this report has been conducted over a number of years, this survey seeks to offer an analytical and evaluative account rather than attempt a full summary of all the research in these fields. We have sought to draw out main traditions of research, and situate the research covered in wider educational and policy contexts at the time. In a concluding section we aim to identify key findings, draw out implications for current policy and practice, and suggest areas for future research.

The survey inevitably draws on the involvement of its authors in aspects of the research covered, not least because this work has contributed to recent publications and knowledge. Though this means that we are informed by (and some may feel over stress) our own work, our aim has been to be rigorous and even handed about the research evidence covered.

In line with the overall purpose of the Primary Review, the approach has been to review research mainly, but not exclusively, from the UK. There are some research studies from overseas that warrant particular mention, for example the experimental USA STAR project on the effects of reduced class size on pupil attainment, because of its unique nature and the degree of impact it has had. We also refer to experimental studies of cooperative learning carried out by seminal researchers in the field (for example David and Roger Johnson, and Robert Slavin).

In line with the intended readership of these surveys we have tried to make the text accessible to all in education; we have avoided technical terms and coverage and have sought to identify the key implications and messages.

The kinds of questions we address in this survey include:

- What have been the main approaches and traditions of research in this area?
- How are pupils grouped in primary schools and what factors affect the adoption of different grouping arrangements?
- What is the impact on teaching and on pupil learning and adjustment of different forms of grouping?
- Are there problems of coherence, transitions and continuity within and between phases?
- What is the research evidence that small classes are important for learning and teaching?

OVERVIEW OF MAIN METHODOLOGICAL TRADITIONS AND ISSUES

In England and Wales there is a strong tradition of comparative studies of primary school organisation. Generally, research under this umbrella aims to identify features of schools and classrooms that have an impact on children's learning and achievement. Some studies are concerned with impacts on children's attitudes, behaviour and aspirations and a small number include these alongside children's academic achievement. Within this tradition there has been some interest in information on teaching and classroom practices that may be affected by school organisational factors such as school and class sizes, structured ability grouping through streaming and setting, and within-class grouping. Effort has gone into

defining, measuring and evaluating the impact of these factors. In this section we concentrate on main methodological traditions, including survey research, case studies, experiments and longitudinal studies.

Surveys and case studies

Survey research provides useful evidence on the extent of different forms of school organisation, such as school and class sizes and ability grouping practices in schools and classrooms. A number of research surveys are concerned with the nature and extent of grouping practices in schools and classrooms (Bealing 1972; DES 1978; Lee & Croll 1995; Hallam, *et al.* 2003; Kutnick, *et al.* 2006; Ofsted 1998b). Evidence is also available from primary school inspections undertaken by Ofsted. Comparisons between survey results help to establish trends over time and are most readily made when samples are based on large, randomly selected samples. Hallam, *et al.* (2003) established the extent of setting, within class grouping, vertical (mixed age) grouping and mixed ability grouping and were able to relate these to school size and age of pupils.

The UK also has a strong tradition of descriptive studies of primary schools and classrooms (for example, Galton, Simon & Croll 1980; Bennett, *et al.* 1984; Tizard, *et al.* 1988; Mortimore, *et al.* 1988; Alexander 1995, 1997, 2001 (the latter comparing primary schools, classrooms and pedagogy in England and four other countries); Galton, Hargreaves, *et al.* 1999). These provide detailed observations of teacher and pupil behaviour in classrooms, including teacher-pupil interactions, time spent on curriculum subjects and issues to do with the management of primary schools.

Descriptive evidence, such as that obtained in surveys and observations, is sometimes linked with other information and used to show relationships between two or more factors. Simple correlation studies provide useful indications of relationships but the design of these studies is not strong enough to draw reliable conclusions about effects of one factor on another; for example, an association between a measure of class size or pupil teacher ratios on the one hand and measures of pupil attainment on the other does not allow us to conclude that class size affects pupil attainment (Blatchford, Goldstein & Mortimore 1998). This is because we often do not know whether the results can be explained by another factor such as initial pupil attainment.

Case study research provides valuable insights into factors that might mediate, or moderate, the effects of school and classroom organisation on pupils, such as the curriculum and teachers' expectations, attitudes and classroom practice. Evidence is obtained from a variety of sources, including members of staff, pupils and other stakeholders, and from observations and secondary data. Compared with research in the secondary sector, where there are several highly influential case studies of ability grouping, there are fewer examples in the primary phase. In the past decade, two multi-site case studies of primary schools have investigated school and classroom grouping practices. The first was a study of six schools of differing size and organisation, which obtained the perspectives of teachers, governors and pupils on the schools' grouping practices, how these groupings were implemented, resourced and evaluated and how they related to pupils' experience of learning (Hallam & Ireson 1999). This research highlighted school policy, ethos, the deployment of resources and classroom practice as factors that mediate the impact of structured grouping on pupils' attainment and their social development. A later set of 12 primary school case studies supplied additional information on the affect of grouping policy on teaching and learning strategies, the nature of tasks pupils undertook in the classroom and the impact on pupil learning (Kutnick *et al.* 2006).

Experimental and comparative studies

For practical reasons, very few randomised controlled trials of school organisation and structure have been reported, as few schools and parents are willing to allow children to be experimented on in this way. Those that exist tend to be of relatively brief duration. One exception is the Tennessee STAR project, in which students were randomly allocated to classes of different sizes (Finn & Achilles 1999; Nye *et al*. 2000).

As we show below there have been experimental studies of the effectiveness of various approaches to small groups. These are predominantly based in the USA and tend to arise from theoretical orientations that are predominantly social psychological. They include studies of co-operative learning (Slavin 1995; Johnson & Johnson 2003) and also include socio-constructivist studies of communication and collaboration (Mercer 2000; Webb & Mastergeorge 2003; Gillies & Ashman 2003). While these studies are insightful in identifying where groups are ineffective, they tend not to consider the whole classroom context within which group work takes place.

Though it is often assumed that experimental studies provide the most unambiguous evidence on causation, there have also been concerns that results are not necessarily valid (for example because control of the main independent variable necessary in experimental designs introduces changes that can make the situation differ from that found in everyday school life) and that alternative, longer term, more naturalistic quantitative methods may be preferable (Goldstein & Blatchford 1998). Recent advances in statistical modelling techniques, such as multi-level modelling, have made such approaches powerful and flexible.

Many studies capitalise on existing differences between schools and classrooms to compare the effects of various forms of organisation. This approach presents fewer practical difficulties but several methodological challenges remain to be confronted. It runs the risk of confounding variables that may co-exist with particular forms of organisation. A change in pupil grouping may be accompanied by changes in curriculum or teaching method for the new grouping, or special materials might be given to an intervention group, or teachers using an experimental approach receive special training whereas teachers in control classes do not. As a result of the co-existence of factors, it is very difficult, if not impossible, to disentangle the separate effects of each one individually.

A number of strategies may be used to control for such factors at various stages of the research process, when constructing the sample of schools or classrooms or manipulating aspects of the pedagogic environment. For example, when assessing the effects of ability grouping on mathematics achievement, Whitburn (2001) ensured that all students were given the same teaching materials, thus holding this factor constant across groups. Likewise, Slavin (1987) restricted his systematic review of ability grouping in primary schools to studies in which the curriculum remained the same for students in same ability groups and mixed ability groups. Control may also be exerted in the analysis stage through the use of sophisticated statistical techniques, which take account of prior differences between students in the specific variables of interest, such as prior academic achievement and socio-economic status (Blatchford *et al.* 2003; Ireson & Hallam 2001, in press 2008; Ireson, Hallam & Hurley 2005; Ireson, Hallam & Plewis 2001). Multi-level regression analysis provides simultaneous estimates of the strength of several school, classroom and individual factors.

Longitudinal studies

Three major longitudinal studies of ability grouping were undertaken in the 1960s (Barker Lunn 1970; Goldberg, *et al.* 1966; Borg 1965). The study undertaken in New York schools by Goldberg *et al.* (1966) was unusual in that school principals assigned each pupil to one of 15

grouping patterns, ranging from extremely broad to extremely narrow, and pupils remained in these groups for two years. Borg (1965) compared two school districts in Utah, one of which had heterogeneous classes and the other of which had ability-grouped classes. Barker Lunn (1970) compared 36 streamed and 36 unstreamed schools in England and Wales and followed children through the four years of junior school, with a later follow up in secondary school by Ferri (1971).

More recent longitudinal studies evaluate the effects on pupils of different aspects of school organisation, teaching and classroom practice in the infant or primary phases. Good measures of pupil attainment, both on entry to the school and at a later stage, allow estimates of school and classroom effects to be made (Tizard *et al.* 1988; Mortimore *et al.* 1988). Classroom mapping is used to obtain information on the layout of classrooms and the composition of groupings (Alexander 1995, 2001; Mortimore, Sammons, Stoll & Ecob 1988) and to explore relationships between group size and composition, learning tasks and activities, interactions within pupil groups and the role of teachers (Alexander 1997; Kutnick, Blatchford & Baines 2002). Observations reveal a variety of groupings utilised by teachers within the classroom. They show that children may be in ability groups or mixed ability groups for the entire day or they may be regrouped for part of the day. Teachers may extract groups of similar ability from mixed groups to work on specific subjects or they may extract mixed groups from groups of similar ability. The size, number and composition of groups vary from one class to another, as does the amount of time that children spend in each type of group. Although seated in groups, a common observation is that children work independently rather than collaboratively or cooperatively (Galton, Simon & Croll 1980; Alexander 1997).

Longitudinal research on class size effects includes a large-scale UK study, which followed over 10,000 pupils in over 300 schools through the primary phase of education from age 4/5 to 11 years of age (for example Blatchford 2003). Longitudinal studies enable researchers to explore connections between variables at different points in time, and the use of sophisticated statistical methods help to unravel the direction of influence and establish reciprocal effects.

Methodological challenges

Several methodological challenges have been identified above, including those associated with the random allocation of pupils, eliminating or controlling confounding factors and defining, measuring and evaluating relevant school and classroom factors. In addition, the diverse structure and organisation of primary schools and classrooms presents a number of methodological challenges to those concerned with the effects of different forms of organisation on pupils. First, there may be variations from one year to the next in the school roll, intake, staffing, number of classes and grouping patterns. Within schools, pupils are grouped in a variety of ways, through streaming, setting, across age groups, mixed ability groups and within-class groupings. Within the classroom, individual teachers have their own grouping arrangements and these may change for different curriculum areas. Even within the same school, grouping arrangements vary for children of different ages (Baines, Blatchford & Kutnick 2003; Ireson & Hallam 1999, 2001; Hallam & Ireson 1999). Considerable care is needed to establish details of school organisation and pupil grouping arrangements.

A second issue concerns the nature of the educational outcomes that are considered. Two major groups of outcomes have been investigated; those relating to children's social and personal development and those relating to academic achievement. Recent research frequently makes use of national Key Stage test results, which provide a common, albeit limited, metric, whereas earlier research used a range of different standardised tests and examinations. In general, however, a narrow range of learning outcomes has been researched with little concern for

critical thinking, creativity and meta-cognitive and transferable skills. Personal and social outcomes have also been assessed in a variety of ways, using interview techniques or self-completion measures of self-esteem, attitudes, motivation and alienation. The variety of measures presents challenges when making comparisons across studies.

Thirdly, findings show that within any single school the effects of class size and grouping are not consistent in size, over time, in different subject domains or between teachers (Baines, Blatchford & Kutnick 2003; Blatchford 2003; Ireson & Hallam 2001). This indicates that schools' unique characteristics and ethos, and teachers' classroom practices and processes mediate the effects of grouping arrangements (Ireson & Hallam 2001). Particular systems of pupil grouping are implemented differently by schools and even by different teachers within the same school.

A final issue is that the effects of school organisation are not consistent for different groups of pupils. Effects vary for pupils of differing ages and abilities. The issue is not merely whether particular forms of school organisation and grouping are effective, but for whom they are effective, in what ways and whether some children suffer as a result.

STRUCTURED GROUPING PRACTICES

Different types of structured groupings in primary schools

Classes in the primary school can be structured in a range of ways. They may include children of only one age cohort or many; up to four in the smallest primary schools. The classes may be mixed ability or streamed (children put into classes on the basis of their measured or perceived ability). Whatever the arrangements for organising individual classes, children may be put into sets for some subjects. Sets differ from streaming in that children from more than one class are reorganised into groups based on attainment. Sets may be formed from within a year group or across year groups. Children may be in different sets for different subjects.

Changes in structured grouping practices over time

Historically, streaming was the dominant form of grouping adopted in the UK following the Second World War. Typically, children were placed in a class based on their ability by the age of seven. The top stream took the 11+ examination and were groomed to go on to grammar schools. The remaining children were set on a path towards the secondary modern school and low-level occupations for the rest of their lives. During the 1960s and 1970s, with the introduction of comprehensive education, the demise of the 11+, and an increasing emphasis on equal opportunities, streaming began to decline. This trend was encouraged by the Plowden report (Plowden/CACE 1967), which advocated a more child-centred approach to primary education, and which was supported by research indicating that ability grouping had no significant effect on overall attainment and had negative personal and social consequences for pupils in the lower streams (Jackson 1964; Barker Lunn 1970, 1984). By the 1970s, of those schools that were large enough to stream, only about 20 per cent chose to do so (Bealing 1972; DES 1978). By the 1990s this had declined further to less than 3 per cent (Lee & Croll 1995). Streaming had almost disappeared, replaced by mixed-ability classes.

Following the Education Reform Act (1988), the 1990s saw the implementation of the National Curriculum and an emphasis on raising standards. Ability grouping in the form of setting pupils was perceived as a way to raise attainment and all primary schools were encouraged to introduce it (DfE 1993). This was reinforced by the White Paper *Excellence in Schools* which suggested that 'setting should be the norm in secondary schools. In some cases it is worth considering in primary schools' (DfEE 1997: 38). The political interest in structured grouping led to a number of literature reviews being undertaken (Hallam &

Toutounji 1996; Harlen & Malcolm 1997; Sukhnandan & Lee 1998). OFSTED also took an interest in ability grouping procedures, and annual reports for 1995/6 and 1996/7 both commented on the increase in teaching based on ability groups (OFSTED 1997, 1998a) particularly in Years 5 and 6 for mathematics and English. Against this background, OFSTED commissioned a survey of a random selection of 900 schools, of which 44 per cent responded (OFSTED 1998b), exploring the prevalence of setting and its effects. The findings indicated that, of those schools responding, about 60 per cent of junior schools set for at least one subject in some year groups, while over one-third of infant schools, and about one-half of combined infant and junior schools, did the same.

A subsequent survey, undertaken by the Institute of Education, University of London (Hallam *et al.* 2003) in 1999, and based on a random sample of 2000 schools (40 per cent response rate), took account of school size, the prevalence of mixed age classes, grouping practices for all subjects, and year group. Within class ability grouping was the most common grouping arrangement in the core subjects of mathematics and English, with mixed ability groups within mixed ability classes the most prevalent practice for all other subjects. The incidence of setting was relatively low (at most 24 per cent in mathematics in Year 6 in schools with same age classes) and the incidence of streaming was negligible. The incidence of setting increased as children became older. In schools with predominantly same-age classes, the incidence of cross-age setting was generally less than that of same-age setting, for example 15 per cent as opposed to 24 per cent in Year 6 in mathematics. In schools with mixed age classes there was more cross-age setting. For example, 18 per cent in Year 5/6 mathematics compared with 12 per cent same-age setting. Other subjects showed the same pattern. More setting occurred in mathematics than in any other subject, steadily increasing towards the end of Key Stage 2, although even here the most common form of organisation throughout both primary key stages was ability grouping within the classroom. There was much less setting in English than mathematics. In science, as in most other curriculum subjects, grouping was mainly mixed ability. There was a large number of mixed age classes in the sample: 356 out of 765 schools had some or all mixed age classes. Of those schools 91 per cent had under 100 pupils. The planning for mixed age classes particularly at Key Stage 2 was complex. Some had classes across key stages although this was relatively rare.

OFSTED primary school inspection data from 2003/04 indicated that 28 per cent of schools were setting for maths in KS2, 15 per cent for English, 2 per cent for science and negligible percentages for other subjects. Overall, primary schools have tended to resist the introduction of structured ability grouping, preferring within-class groups.

Schools' rationales for the practices that they adopt

Studies which have explored headteachers' and teachers' rationales for adopting particular grouping strategies have suggested that these are pragmatic and not driven by dogma. Many schools have little option but to have multi-grade classes because of cohort sizes. A range of factors determine decisions about the organisation of classes and the groupings within them (Lee & Croll 1995). Hallam, Ireson and Davies (2002, 2004), in a large scale survey following considerable policy changes that included the introduction of the literacy and numeracy hours and exhortations to introduce setting, found that 48 per cent of schools had made no changes in their grouping structures, 22 per cent had made changes because of the literacy hour, 2 per cent because of the numeracy hour, 7 per cent because of a combination of these, and 21 per cent for other reasons. Issues that schools considered when making decisions about grouping structures related to:

- learning (differentiation, raising attainment, developing pupil skills and good behaviour, flexibility);

- teaching (planning and delivery of the curriculum, use of more whole class teaching);
- academic subject concerns (groupings for different subjects, making use of teacher expertise);
- introduction of the National Literacy Strategy;
- school and cohort size (issues relating to mixed age classes, setting);
- resources (staffing, timetabling, space, teaching assistants/parents);
- as a result of evaluations of different grouping practices (perceived success, reduction in class teacher contact time, time lost in movement between sets).

The arrival of a new headteacher can also facilitate change (Hallam *et al.* 2002) while parents can also be influential in the practices which schools adopt (Davies, Hallam & Ireson 2003).

When streaming was commonplace in the 1960s, Jackson (1964) found that policies were based on the assumption that ability was largely inherited and therefore immutable. Within streamed schools there was prejudice against pupils of below average ability. Barker-Lunn (1970) noted a difference in ethos between streamed and non-streamed schools. The former were more systematic in their educational approach, concentrated more on the 3Rs, made greater use of tests, and had more authoritarian teachers. Teachers in non-streamed schools were more permissive, preferred more active methods of instruction, emphasised self-expression and personal experience and were critical of tests, selection and streaming. More recent research (Hallam *et al.* 2002) has indicated that while there may seem to be little difference in school ethos as defined by educational aims included in school documentation or as reported in interviews with teachers, in practice there are substantial differences in the way these aims are operationalised. In the six schools studied, similar aims to enable every child to fulfil their potential were pursued through streaming, different levels or types of setting, or mixed ability teaching. These impacted on the pupils in very different ways, affecting the nature of the teaching, the allocation of teachers to classes, and pupil experiences. The pupils were socialised into the particular practices adopted within each school, although ethos differences emerged in the level of reported teasing related to ability, the particular pupils targeted, and the extent to which pupils were aware of their position in the pecking order. Grouping structures, while they did not define school ethos, clearly played a role in shaping shared attitudes within the school which in some cases valued some pupils more than others.

Historically, the allocation of pupils to ability groups was a somewhat arbitrary affair (Barker Lunn 1970; Jackson 1964). Recent research suggests that it is currently based on Cognitive Ability Tests, national attainment tests, or a combination of both, although many different factors influence the groupings that are formed in schools and classrooms including social relationships between pupils, gender and behaviour, physical aspects of the classroom and class size. Some pupils exhibiting poor behaviour are placed in low groups irrespective of their level of attainment. In other cases, teachers deliberately split up groups of potentially disruptive pupils into different ability groups in order to be better able to control their behaviour. Other factors such as group dynamics are taken into account (Davies *et al.* 2003).

Although, in theory, movement between streams or sets is possible, in practice it is frequently restricted and children perceive that it is very difficult (Hallam *et al.* 2004). One problem is that there is often a gap between work that has been undertaken and what is required for the higher set (Jackson 1964). Where children do change group if the movement is in an upward direction they tend to do better, while in a downward direction they tend to do worse (Barker Lunn 1970). When streaming was widely adopted in the UK, there was clear evidence that the low streams tended to include disproportionate numbers of pupils of low socio-economic status, boys and those born in the summer (Barker Lunn 1970). More recently it

has been demonstrated that pupils in certain ethnic groups are over-represented in low sets in some secondary schools (Gillborn & Youdell 2000), although data are not available for primary schools.

Mixed age classes

Data from the DfES (2002) indicates that about one in four classes in primary education are mixed age, with 25 per cent of pupils taught in such classes. Some of these are in small schools in rural communities where size constrains choice, while others are in urban communities. Research relating to small schools in rural communities tends to draw positive conclusions about the benefits of such groupings, frequently referring to the family atmosphere engendered (Cornall 1986; Galton & Patrick 1990; Francis 1992; Vulliamy & Webb 1995; Hargreaves, Comber & Galton 1996; Hayes 1999; OFSTED 2000).

In contrast to this, large schools where single-age year groups would have been possible have been criticised for adopting mixed age classes because of the negative impact on attainment and the difficulty that teachers experienced in matching tasks to pupil needs (HMI 1978). Galton and Simon (1980) also found that children in mixed age classes tended to achieve less but the differences were very small and the causes seem to be related to students concentrating less on their work, spending more time waiting for their teacher, and in routine interactions. In a large-scale study of multi-age teaching in a variety of contexts, Bennett, O'Hare and Lee (1983) found that multi-age groups were predominantly adopted out of necessity because of cohort size. Teachers typically grouped children within the class on the basis of ability, or individual assignments, but rarely age. Mixed age classes put more stress on teachers and required greater preparation and more resources, but there were advantages in terms of flexibility of staff, children, and space. Case study interviews in selected schools (Lee 1984) revealed that heads and staff made conscious decisions to avoid having multi-aged classes. Teachers indicated that their approach to teaching remained the same as teaching a single-age class.

More recent research, undertaken since the introduction of the National Curriculum and testing at KS1 and KS2, has highlighted a number of challenges and advantages of mixed age teaching. Berry and Little (2006) studied headteachers' and teachers' attitudes towards multi-age classes in 10 primary schools in London. Challenges associated with multi-grade teaching fell into three categories: curriculum organisation, ability range, and assessment. Opportunities included the adoption of a cognitive/stretching model, peer tutoring and behavioural stretching/modelling. These are very similar to the reported strengths and weaknesses of mixed ability classes. Most teachers expressed a preference for single age classes, although almost as many had no preference. In relation to the National Curriculum and testing, teachers had to integrate curriculum frameworks, plan over a two year cycle, and plan up or down from one curriculum framework. Preparation for national testing also presented challenges. Hallam *et al.* (2002) found that schools sometimes adopted age-specific setting to allow pupils in Year 6 to prepare for their tests.

The impact of different types of structured grouping on attainment

Relatively few studies have explored the impact of different structured grouping strategies on attainment in primary schools in the UK. When streaming was common, Daniels (1961a) found a higher average level of attainment in schools that did not adopt streaming. This seemed to be caused by an increase in the attainments of the lower attaining pupils rather than the higher attaining pupils being held back. Blandford (1958) in a comparison of streamed and non-streamed schools found similar results with a greater spread of scores in streamed schools. The largest early study compared pupils in 36 streamed and non-streamed primary schools on a wide range of criteria (Barker Lunn 1970). The findings showed no

difference in the average academic performance of boys and girls of comparable ability and social class in streamed or non-streamed schools. A follow-up study, two years later, showed no difference in performance at secondary school in relation to prior streaming in primary school (Ferri 1971). Daniels (1961b) compared achievement in streamed and unstreamed schools over a four-year period and concluded that lower ability pupils made better progress in unstreamed schools. International reviews of research on streaming in primary schools (Slavin 1987; Kulik & Kulik 1987, 1992; Kulik 1991) have also indicated that streaming has little impact on pupil attainment.

In the current context, where ability grouping tends to be based on setting for particular subjects rather than whole class streaming, Whitburn (2001) explored the effects of setting on mathematics in the primary school on the progress of over 1,000 pupils in a single education authority. When the same teaching materials were used for Key Stage 2 mathematics, the test results of pupils in mixed-ability classes were significantly better than those taught in sets. Lower-attaining pupils made better progress in mixed-ability classes, without hindering the progress of higher-attaining pupils. In case studies of 12 primary schools Kutnick *et al*. (2006) found that, where schools adopted setting, pupils rarely performed at KS2 levels higher than their local authority or national averages in the subjects which were setted. Value added for these schools was generally negative, while case study schools that used mixed-ability groupings tended to have positive value added although there were exceptions. International reviews of setting (Kulik 1991; Kulik & Kulik 1992) have shown no consistent effects on attainment. Some studies have shown small positive effects, and some small negative effects. Overall, the effects have been negligible. Slavin (1987) reviewed seven studies which explored the impact of setting on elementary pupils' levels of achievement in either reading, mathematics, or a combination of the two. Five of the seven studies concluded that students placed in sets learned more than those in mixed ability classes, while the remaining two studies concluded that pupils in mixed ability environments learned more than those in sets.

Vertical or cross-age grouping is adopted of necessity when the intake of pupils to a school cannot be allocated to single-year group classes. In some cases, although rarely, it is adopted because of the perceived educational benefits arising from the social and family-like structure of classes where pupils are taught by the same teacher for several years (Veenman 1995). International reviews of attainment have shown no significant differences between vertical grouping and single-aged grouping in terms of pupils' academic achievement, although cross-aged setting where pupils of similar attainment are drawn from more than one age group for particular activities, for instance reading, can be positive (Slavin 1987; Kulik & Kulik 1992).

The most common grouping practice adopted in UK primary schools is within-class. International reviews have shown that within-class grouping in relation to ability or attainment can be effective in raising attainment (Lou *et al.* 1996). The effects seemed to be the greatest in mathematics and science. Pupils of low ability learned more in mixed-ability groups, whereas pupils of average ability learned more in groups of similar ability. High-ability pupils were unaffected by the type of grouping. Both mixed ability and ability groups produced good results in mathematics and science, whereas ability groupings were better for reading. Working in groups seemed to support learning in mathematics and science regardless of the type of group (Kulik & Kulik 1987; Kulik 1991; Slavin 1987). More information on within-class grouping is provided in Section 4.

The teachers' perspective and the impact on pedagogy

Studies of teachers' attitudes towards structured ability grouping in the UK and elsewhere have revealed generally positive attitudes towards teaching classes where pupils are

grouped by ability (Daniels 1961a; Jackson 1964; Barker-Lunn 1970), although the grouping practices dominant in the school in which they teach are important mediators (Hallam *et al*. 2002). Historically, high ability groups in streamed systems were taught by those teachers who were perceived as the 'best', usually the more experienced and better qualified. Low streams have tended to be allocated to the less experienced and less well-qualified teachers (Jackson 1964; Barker Lunn 1970). Recent research suggests that primary schools have perceived this as making best use of teacher expertise (Hallam *et al*. 2002).

A substantial literature now indicates the tendency for instruction in lower ability groups to have a different quality to that provided for high ability groups. At primary school, teachers and pupils expect top sets to undertake more difficult work at a faster pace. There is often differential access to the curriculum, the top groups benefiting from enhanced opportunities. An informal syllabus may also operate where, for the lower ability groups, topics are omitted and there are different expectations. Teachers tend to believe that they are matching instruction to the level of the students' ability but the evidence suggests that many pupils find that the work they are given in structured ability groups is inappropriate, and that often it is too easy (Hallam *et al*. 2002, 2004).

The impact of different types of structured grouping on children's personal and social development

Case studies of six primary schools in the UK, adopting different grouping practices, showed that pupils were aware of the grouping structures operating in their school, the reasons for them, and their advantages and disadvantages. They understood why and how they were grouped and accepted the rationales provided. Where streaming or setting was adopted these structures were perceived as providing work at the right level which would help pupils to achieve their full potential. In one school where mixed ability teaching was deliberately adopted to encourage the development of social skills and team work, the pupils were able to articulate this aim. In all cases pupils were socialised into the values of the school, as established by teachers and accepted by parents. Where structured ability groupings were adopted they legitimised, and made more transparent, differences in pupils' attainment. Some children, particularly those in the lower groups, experienced teasing and stigmatisation, although in the school where the emphasis was on working together it was the more able pupils who were more likely to be teased. Contrary to popular belief, pupils at primary level were not always aware of the extent of the differences between them. This was particularly true of the boys who tended to overestimate their ability, especially when they were in mixed ability classes. The children's attitudes towards school did not appear to be affected by grouping structures, but pupils' awareness of their place in the pecking order and the nature of teasing in the school were. However, these were mediated by school ethos (Hallam *et al*. 2004).

International reviews of the impact of different grouping structures on self-concept have found no overall effect of ability grouping on self-esteem (Kulik 1991; Kulik & Kulik 1992). When pupils of different levels of attainment have been considered, ability grouping has tended to raise the self-esteem scores of lower ability pupils and reduce the self-esteem of the higher ability students. This suggests that structured groupings might have a levelling effect, with the more able children losing some of their self-assurance when they are placed in classes with children of similar ability. However, Devine (1993) found that the self-image of pupils of average and high ability remained similar regardless of type of grouping (sets or mixed ability) although only 3 per cent of pupils in low-ability groups held a high self-image compared with 29 per cent of similar ability pupils in mixed-ability groups. As with attainment outcomes, the effects of different kinds of grouping on pupils' self-esteem may be mediated by other factors; in this case, school ethos and the attitudes of teachers and peers.

In relation to social mixing and cohesion, the evidence suggests that primary school pupils tend to select those of similar social class, ability and ethnic grouping regardless of the grouping arrangements in the school (Barker Lunn 1970), although more social mixing occurs where pupils are not ability grouped. The recent adoption of setting procedures, where pupils regroup for different subjects as they progress through school, can split friendship groups and reduce the social support that pupils have developed. Some pupils report anxiety when groupings change and they have to work with different pupils and fit into new structures (Chaplain 1996). It has been suggested that mixed-ability teaching can lead to greater social cohesion because pupils help each other and the more able provide encouragement and support for the less able by their example (DES 1978; Scottish Office 1996). Pupils themselves perceive that this is the case (Hallam *et al*. 2004). However, in a study of the teaching of 9-11 year olds, Peverett (1994) found little evidence that lower ability pupils benefited from the presence or support of higher ability pupils.

WITHIN-CLASS GROUPING

One of the few features of educational life that can be stated with certainty is that all pupils are grouped within classrooms. Consideration of 'grouping' in classrooms should not simply focus on what has traditionally been referred to as the 'small group' or the number of children that can sit around a table in the classroom (usually between four and six pupils). Classroom grouping, in terms of how the class is organised and taught, may consist of a whole class seated and working together, small groups, large groups of 7 plus, pairs of children or individuals working alone. Descriptive research shows that in both primary and secondary schools, any classroom may consist of a number of different sized pupil groups working simultaneously and group size may vary as a lesson progresses (Baines, Blatchford & Kutnick 2003; Kutnick *et al*. 2002). The number and type of pupil groups found in any classroom may be based on historic procedures and attitudes regarding teaching and learning.

In line with traditional classroom pedagogy, primary school teachers will often have responsibility for a whole class. However, it should be noted that a pupil will spend the majority of classroom time in the presence of peers (whether simply by being seated next to other children or actually working with other children). Thus, each pupil will have a very limited amount of time to interact with their teacher and we need to consider the role of within-class grouping in relation to the pupil's learning and the quality of interactions with peers as well as teachers.

Historical background

In England, consideration of pupil grouping in classrooms may be traced back to early recommendations of the Hadow Committee report on primary education (Board of Education 1931); yet recommendations for the use of pupil grouping have been most strongly linked to the Plowden Report (Plowden/CACE 1967). Plowden's recommendations contained an assumption that teachers would gradually adopt a pupil-centred orientation to classroom pedagogy, and that this orientation would focus on developing individual children's understanding and interest. To allow the teacher to focus on particular children at any one time in the classroom, other children had to be occupied and group working tasks were recommended. Children in these groups would be differentiated by attainment within a particular curricular area or topic. Grouping in Plowden was conceptualised as of value in occupying the majority of the pupils in a class while the teacher focused attention on a few particular pupils. It was also a means of differentiating pupils by attainment for focused teaching. While Plowden's recommendations may have appeared radical in their day,

research showed that very few teachers at that time (and subsequently – over the next four decades) adopted the suggested teaching style (see, for example, Bennett 1976; DES 1978; Galton, Simon & Croll 1980; Kutnick 1988; Alexander 1997; Galton *et al.* 1999; Tizard *et al.* 1988). Research did find, however, that a dominant characteristic of a typical 'traditional' primary school teacher was their grouping of pupils within the classroom by attainment, especially in reading and mathematics (Barker Lunn 1984).

One distinct characteristic of primary school classrooms did develop between the 1950s and the 1990s; this was the physical seating of pupils. Until the 1960/70s, seating of pupils had been traditionally based at the individual desk, often set out in rows that faced the front of the room. This arrangement has been associated with didactic, rote/repetition and whole class teaching approaches (Hastings & Chantry 2002). Between the 1950s and 1990s, the traditional desk gave way to the large-scale adoption and incorporation of small tables (of various designs) around which between 4 and 6 children could sit (Galton *et al.* 1999; Hastings & Chantry 2002). Research has also shown that these groups of pupils rarely worked together.

The grouping of pupils in classrooms: findings from experimental and naturalistic research

Studies concerning group work in classrooms can be divided into two broad categories, representing naturalistic descriptions and experimental change of classroom activity (Kutnick, Blatchford & Baines 2002).

Experimental studies tend to arise from, or can be associated with, theoretical orientations that are predominantly psychological. Theories underlying co-operative learning (Slavin 1995; Johnson & Johnson 2003) have described their roots in the social psychological theories of Deutsch (1949) and Lippett and White (1943), that stress the advantages of interdependence within heterogeneous groups, and Allport's (1954) operationalisation of 'contact theory' (that is to say that members of a group agree to seek a common goal and each member provides a unique, equally valued contribution towards that goal). When the social psychological focus on interdependence is applied to classroom studies (especially in comparisons of co-operative learning to traditional learning) findings show consistent enhanced relational and pro-school attitude development among pupils, and moderate learning gains (Johnson & Johnson 2003; Slavin, Hurley & Chamberlain 2003; Gillies 2003). While experimental studies are insightful in identifying where groups are ineffective, and recommending particular interpersonal and communicative methods to enhance group working, they tend not to consider the whole classroom context within which group work takes place. They also necessarily focus on singular aspects of behaviour within classrooms (for example communication) and take place over a limited duration of time.

Naturalistic studies, on the other hand, do account for the whole class context – often including a number of sociological concerns, for example regarding social inclusion and participation of all children within the classroom. For convenience, we divide naturalistic studies into two phases: studies between 1980 and 2000 that identify a range of problems associated with group work in classrooms, and recent studies that see classrooms as a 'social pedagogical' context within which pupil groups may be seen to promote or inhibit classroom learning and motivation.

From the first phase of naturalistic studies, three dominant themes arise: 1) while children experience classroom activity in groups, these groups may vary in size and phase of lesson; 2) children often do not work productively in groups; and 3) teachers are not confident in establishing and supporting group work. Descriptions of primary classrooms (see especially Galton, Simon & Croll 1980; and Galton, Hargreaves, Comber & Pell 1999) show that the

children may be found in large groups (such as the whole class), in a range of small groups (usually about 4 to 6 children, seated around a classroom table), and in pairs or triads (sometimes sharing a table with other pairs). Additionally, pupils may be found working as individuals (often sharing table space with other individuals). These different group sizes are likely to be associated with phases of a lesson – with large groups/whole class coming together at the beginning and end of a lesson and smaller groups used in the middle of a lesson. Pedagogically, group sizes may relate to the variety of learning tasks that characterise a lesson; broad categories of learning task include new/cognitive knowledge, extension of existing knowledge and practice/revision of knowledge (from Norman 1978; and used in Bennett, Desforges, Cockburn & Wilkinson 1984, and Edwards 1994). These studies can be integrated to show a relationship between group size and learning task (Kutnick 1994). However, studies such as Galton *et al*. (1980), Alexander (1997), and Galton *et al*. (1999) identify a number of disparities such as children being most often found seated in small groups (for up to 80 per cent of their classroom time) while being assigned individual tasks, and the quality of talk within the small groups being likely to be at a low cognitive level. Other disparities found were: the assignment and use of small groups based on distribution of furniture in the classroom (Dreeben 1984); differentiation of pupils by ability-based seating (Ireson & Hallam 2001); teacher difficulties in the selection and design of tasks that legitimise group interaction (Bennett & Dunne 1992; Harwood 1995); and the fact that teachers tend not to move tables to accommodate individual, paired, small or large group seating for specific learning tasks (Hastings & Chantry 2002).

Importantly, many children, as well as their teachers, do not like working in groups (Cowie & Rudduck 1988). Galton (1990) found that children often feel insecure and threatened when told to work in groups – and pupils respond to this threat by withdrawal from participation or looking to the teacher to give legitimacy to their responses within groups. Teachers have expressed particular concern about: loss of classroom control, increased disruption and off-task behaviour (Cohen & Intilli 1981); children not being able to learn from one another (Lewis & Cowie 1993); group-work being overly time consuming, and the assessment of children when working in interactive groups as being problematic (Plummer & Dudley 1993); and that only the more academically able profit from group work. Teachers have also expressed the view that pupils, particularly boys, will misbehave during group work and that discussion within group work may cause conflict between pupils (Cowie 1994).

Findings from this first phase of naturalistic studies therefore make depressing reading for those who are aware of the success of experimentally-oriented studies of group work with school-aged pupils. The overall problem is that there is little coordination between the size of pupil groupings, their composition, pedagogic purpose of learning task and interactions among group members. In short, there is little awareness of social pedagogical relationships inherent in the classroom. It is of little surprise, therefore, if pupils and their teachers do not express confidence or liking of group work, and both feel threatened by group work.

In the second phase of naturalistic studies, a clearer understanding of the bases for success and failure of group work in the classroom is established. The social pedagogic approach drawn upon by Blatchford and Kutnick, for example, focuses on relationships between pupil groups (their size and composition), learning tasks, supportive interactions with peers and teachers, and whether pupils have received training for effective group working (see Blatchford, Kutnick, Baines & Galton, 2003, for more background to this approach). Evidence referred to in this phase arises, in the main, from 'mapping' classrooms while pupils engage in learning tasks, and from interviews with teachers (for a fuller discussion of mapping as a systematic, multi-dimensional description of grouping practices and more on data reported

below see Baines, Blatchford & Kutnick 2003; Blatchford, Kutnick and Baines 1999; and Kutnick *et al*. 2002).

Mapping in primary schools showed that the majority of pupils were seated in small groups (50 per cent of mappings), and whole class groupings accounted for a further 20 per cent. In only 2 per cent of observations were individuals seated alone. Larger groups, as might be expected by their size, were mixes of boys and girls and ability. Smaller groups tended to be single-sex, single-attainment and friendship-based. The predominant learning task type used in classrooms was practice tasks, and the least likely task was new knowledge/cognition. While virtually all children were found seated in pairs or larger groupings, over 60 per cent of the assigned tasks asked children to work individually. Teachers and other adults in the classroom were only able to work with approximately one-third of the pupil groups in their classrooms at one time.

While most of the observations found children seated in pairs or larger groups, only a quarter of the (nearly) 200 teachers participating in the study stated that they prepared their classes for group working; and the majority of these teachers cited 'circle time' as their only form of group work preparation. Other social pedagogic concerns regarding group work found in this study included:

- The small groups that dominated classroom experience were likely to be composed of same-sex and same-ability pupils, providing contexts of social exclusion rather than inclusion in the classroom; this was especially true of low attaining boys (who were mainly assigned individual tasks where they were not asked to interact or discuss the task with others) and high attaining girls.
- In findings similar to the first phase of naturalistic research results, there was no clear relationship between the size of groups and the learning tasks/interaction assigned – most pupil groups were assigned practice tasks that required children to work alone.
- Adults in the classrooms tended to work with the whole class or large groups, or they worked with individuals, leaving most of the small groups to work autonomously from teacher or adult support.
- Adults were present in virtually all of the observations within which new knowledge/cognition was presented, thus inhibiting opportunities for pupils to co-construct and further develop their own new knowledge.

As a result of this systematic description of the range and use of pupil groupings in authentic primary school classrooms, three main concerns are identified (see Blatchford, Kutnick, Baines and Galton, 2003, for a full account).

1. Relationships are fundamental for effective group working: Pupils often feel threatened and do not understand how to work in a group of their peers. Teachers have not overcome this lack of group working 'skills' in their classrooms. On the other hand, we also know that teachers and pupils appreciated that supportive relationships are essential for the promotion of learning – relationships that build upon trust between peers and between children and teachers, and the ability to communicate effectively and jointly resolve problems with partners (Hall 1994; Kutnick, Blatchford & Baines 2005).
2. Effective groupwork involves an effective classroom context: If group work is to be effective, pupils must be able to work in a socially inclusive manner with all other members of their class (and not be dominated by same-gender and friendship preference groups as noted in Kutnick & Kington 2005; Kutnick, Blatchford & Baines 2005). In order for pupils to be able to draw upon supportive relationships and be less dependent on their teachers in their learning, the physical (for example seating and furniture layout),

interactional (for example group composition and size) and curriculum contexts of the classroom must be co-ordinated to support group work.

3. Teachers are essential for the organisation of the learning experience of their pupils: But they rarely draw upon social pedagogic principles that relates pupil group size and composition to learning task and interaction, which would in turn promote effective group working.

How to make group work more effective: research findings

There are a number of studies that have explored ways in which group work and group work processes can be more effective. One set of studies explores group processes connected to cognitive and attainment progress (see Webb & Mastergeorge 2003; Webb & Farivar 1994; Mercer 2000; and others). Webb has argued that effective group working is dependent on effective communication among group members (including pupil-pupil explanations, pupil ability to help others in need and ability to ask for help from others). Pupils who undertake focused questioning, exploration of alternate answers and explanation for these answers are more likely to solve cognitive-based problems.

Researchers in England, especially Mercer (2000) and colleagues, have developed programmes to enhance 'exploratory' talk (a concept similar to explanatory or elaborative discussion). As part of a wide-ranging approach to transforming teaching and learning at Key Stages 1 and 2 in England, a National Strategy has produced a suite of training and guidance materials concerning teaching and learning approaches for classrooms, with some focus group work in application to numeracy and literacy and for group working generally (DfES 2003, 2004). These materials are based on the work of Mercer and colleagues, as well as other recent research such as Alexander's work on 'dialogic teaching' which proposes generic strategies and principles for improving the cognitive power of classroom interaction in whole class as well as small group settings (Alexander 2006). Materials focus explicitly on developing teachers' knowledge and understanding of a range of general group work issues such as benefits and drawbacks of various group sizes and pupil attainment grouping.

Other UK-based research focusing on cognitive processes includes that by Howe, working with Tolmie and others (see Howe & Tolmie 2003). Focusing particularly on the teaching of science in primary classrooms, these researchers note that group work is often 'used to support the integrated acquisition of conceptual understanding and testing procedures', and that this is promoted in current curriculum policies in Scotland and England. Children may encounter many problems in pursuing this approach unless they 'a) discuss conceptual material in small groups and reach consensus, and b) subject consensual positions to guided empirical appraisal'.

During the course of the 1990s, Howe and Tolmie conducted laboratory-based research on group work in science at all levels of the curriculum, with the object of trying to define the basic processes which led to productive outcomes for learning. This research established that:

- Tasks which uncover differences between group members' personal ideas about the topic in hand and lead to an exchange of views are central to growth in understanding (Howe, Rodgers & Tolmie 1990; Howe, Tolmie & Anderson 1991; Howe, Tolmie, Anderson & Mackenzie 1992; Tolmie, Howe, Mackenzie & Greer 1993).
- Discussion of this kind can have two effects: post-activity reflection and individual change, or on-task synthesis of different perspectives (Howe, Tolmie & Rodgers 1992; Tolmie & Howe 1993; Howe, Tolmie, Greer & Mackenzie 1995; Williams & Tolmie 2000).

Subsequent work focused on the design and support of group activities to promote the gathering, exchange and coordination of views. This research found that it is most productive to direct support at initial procedures for gathering information and achieving a consensus about which elements are important, and then leave group members to debate its wider meaning among themselves (Howe & Tolmie 1998; Howe, Tolmie, Duchak-Tanner & Rattray 2000; Howe & Tolmie 2003). Recently, tests of applicability of these basic findings to non-laboratory settings have confirmed the central influence on learning in classroom group work is the exchange of differing views, and also the importance of initial teacher resourcing and support of debate between pupils (Howe, Tolmie, Thurston *et al*., in press; Tolmie, Thomson, Foot, Whelan, Sarvary & Morrison 2002).

In Circle Time programmes (Bliss *et al*. 1995; Curry & Bromfield 1998) and PSE materials (Button 1981, 1982), trust and an associated willingness to discuss feelings are seen as a prerequisite for the examination of sensitive issues and activities designed to facilitate personal development. In these materials, the building of successful groups is addressed almost exclusively through an initial teacher-led training period and there is relatively little emphasis on important aspects of group structure within subsequent activities.

Programmes which are strongly grounded in the development of group dynamics (Stanford 1990; Kingsley-Mills, McNamara & Woodward 1992; Thacker, Stoate & Feest 1992) clearly specify particular attitudes and skills to be addressed and developed at each of the 'forming', 'norming' and 'storming' stages of group development (Tuckman 1965) in preparation for the productive work which should follow. A range of the materials emerging from group work research also identifies skills to be taught quite explicitly and suggests that they should be clearly specified as goals, and practised and reflected upon within group work activities (Johnson & Johnson 1987; Aronson & Patnoe 1997; Farivar & Webb 1991). Farivar and Webb give a particular order in which different attitudes and skills should be addressed: first 'class-building' activities, then group-work skills, then communication and co-operative skills, and finally helping skills.

Wilkinson and Canter (1982) list a further range of skills under the headings 'verbal', 'non-verbal' and 'assertiveness' which, together, are intended to constitute the building blocks of successful social interaction; these skills are to be developed depending upon an assessment of the needs of the particular individual(s) involved. Other skills that have been specified to aid general collaboration include role skills (Stanford 1990; Daniels 1994) such as leadership skills (Johnson & Johnson 1987); decision making (Stanford 1990; Kingsley-Mills *et al*. 1992); challenging or being critical (Lloyd & Beard 1995; Dunne & Bennett 1990; Johnson & Johnson 1987); supplementing ideas, improving work, compromising (Lloyd & Beard 1995); tutoring skills (Johnson & Johnson 1987); helping (Farivar & Webb 1991; Aronson & Patnoe 1997); and sharing (Aronson & Patnoe 1997).

Based on the understanding that skills in talk and discussion are likely to promote and support learning within the classroom, particular attention has been directed at 'argumentation'. Argumentation is the 'coordination of evidence and theory to support or refute an explanatory conclusion, model or prediction' (Suppe 1998, cited in Simon, Erduran & Osborne 2002). It functions to engage learners/coordinate understanding while allowing teachers to gain a range of insights into children's conceptual understanding, and may be linked to formative feedback. Exposition of children's alternative views has been developed in a range of argumentation techniques for use in the classroom (for example, see Johnson & Johnson 1994).

One of the few approaches to groupwork based on a large scale quasi-experimental study is that used in the SPRinG (Social Pedagogic Research into Group work) project (Blatchford, Galton, Kutnick & Baines 2005). This addressed the wide gap between the potential of group

work, and its limited use in schools and the three main concerns given above. To do this successfully suggested that a new approach to conceptualising group work in classrooms was needed – an approach that would ground itself in the reality of everyday school life and the concerns of teachers and pupils, and integrate group work into the fabric of the school day.

The SPRinG project is distinctive in being a general programme that applies group work across the curriculum and over the school year. The team worked with teachers to develop a programme of group work that could be successfully integrated into school life, and which took on board the concerns and difficulties teachers can have with group work. The programme built on and extended previous research by stressing three key principles:

- First, it stresses supportive relationships between pupils through a 'relational' approach. Activities were designed to help pupils communicate effectively through listening, explaining and sharing ideas, but also to help them trust and respect each other, and plan, organise and evaluate their group work.
- Second, the programme provides guidance on the key role of the teacher in adapting grouping practices for different purposes and learning tasks and in supporting and guiding groups. The key aim is to encourage pupil independence rather than directly teaching pupils.
- Third, for group work to be successful the classroom and groups need to be organised and managed in supportive ways. There was guidance on classroom seating arrangements, and characteristics of groups such as their size, composition and stability over time.

The project was extensively evaluated (see Baines, Blatchford & Chowne, in press; Blatchford, Baines, Rubie-Davies, Bassett & Chowne 2006; Blatchford, Galton, Kutnick & Baines 2005; and Kutnick, Ota & Berdondini, in press). Its effectiveness was tested by comparing pupils trained with the SPRinG programme with pupils who were not, but who were engaged in parallel educational research. The main research question was whether the group-work programme led to increases in learning and attainment, more 'favourable' behavioural and dialogue patterns supportive of learning, and motivational patterns and attitudes to learning. The study involved an intervention over a longer time frame than many such studies, taking a full school year rather than being performed just before and after the usual brief intervention period.

The research found that, far from impeding learning, group work led to raised levels of achievement. At KS2, for example, the programme concentrated on science activities and led to significantly higher attainment and higher conceptual understanding and inferential thinking (effect sizes 0.21 – 0.58). At KS1 in reading/literacy, children in the experimental condition improved more than those in the control group (effect size 0.23). In mathematics, children in the experimental group improved more than the control children (effect size 0.71). Despite some teachers' worries that group work might be disruptive, systematic classroom observations showed it actually improved pupils' behaviour in class. SPRinG groupwork raised pupil levels of engagement in learning, encouraged them to become more actively engaged in the learning process and facilitated more higher level, thoughtful learning processes. Other findings indicated that teachers' own professional skills and confidence were enhanced. They found their teaching repertoire was extended and there were unexpected benefits as, for example, pupils developed group working skills, and teachers found they were 'freed' from some procedural duties and classroom control and were now able to spend more strategic time on teaching. Group work seemed to be most effective when adopted by the whole school, rather than the individual teacher, so that there

could be integration of principles of group learning between classes and across the school experience. Teachers working in areas of deprivation or in difficult circumstances found that group work could be used successfully and could aid classroom relationships and integration.

TRANSITIONS: PRE-SCHOOL TO PRIMARY, TRANSITION WITHIN THE PRIMARY PHASE AND TRANSITION FROM PRIMARY TO SECONDARY

During their primary school careers children in the UK pass through a number of important transition points. These include transition from Foundation Years to Key Stage 1, transition between Key Stages 1 and 2 and the transition to 'big school' between Key Stages 2 and 3. Much of the research in the UK has focused on this latter transition, providing qualitative and quantitative evidence supporting ways in which this crucial point of change may best be supported by school management teams, teachers, parents and carers. Relatively little research has been undertaken that is specifically concerned with the former two key transitions, nor has there been a great deal of research relating to transition between year groups in primary school. However, there is some evidence (Minnis *et al*. 1998) that the effects of transition are cumulative; hence the importance of taking an overview of transition experiences throughout the primary years and their possible impact on outcomes for pupils. This brief review will highlight some of the recent key studies in the UK relating to transition across the primary years.

Transition from Early Years to Key Stage 1

Sylva *et al.* (2004) carried out a large scale investigation into the impact of pre-school settings on children's cognitive and social/behavioural development through the transition to KS1. This longitudinal (five year) project employed both quantitative measures and qualitative methods to examine the progress between ages three and seven of 3000 children from six different types of pre-school setting. (Further funding has allowed Sylva and her colleagues to track pupils through to the end of their primary school years.) The sample also included 300 'at home' children who had no pre-school experience before starting school. Pre-school experience, compared to none, was found to enhance all-round development in children, continuing to have a positive impact on the children's social and cognitive development throughout KS1. Issues of pre-school quality were raised, with the qualifications level of staff found to be significantly related to children's academic and social/behavioural development. The team also found that the quality of the home learning environment, only moderately related to parents' education and socio-economic status, was an important factor in facilitating the progression from pre-school through KS1 and was found to be a significant protective factor against risk of future Special Educational Needs (SEN) (Sammons *et al*. 2003).

Sanders *et al.* (2005) added to the body of evidence relating to transition from Foundation Years to KS1, interviewing school staff from sixty schools as well as seventy children and their parents. The researchers conclude that transition is most usefully viewed as a process of change that is most successful when it is gradual and characterised by continuity and good communication. The salient point is made that in England, unlike most of the rest of Europe, children make the transition from pre-school environments into Reception classes and then just one year later undergo a second key transition. This second transition involves having to adapt from a play-based environment to more formal subject-based and teacher-directed learning. There is a suggestion that anxiety amongst children and parents relating to the transition from Reception to Year 1 may not have received the attention it warrants. The process was found to be made easier for teachers, parents and pupils alike when induction

strategies were implemented, including visits from Reception to Year 1 as well as enhanced lines of communication between Foundation and KS1 teachers and between teachers and parents. Furthermore, when Year 1 children were given opportunities for play-based learning and for expressing their own expectations of Year 1 this was found to alleviate their anxiety.

Recommendations for good practice in transition from Early Years to KS1

Pre-school case studies (Sylva *et al*. 2004: vi) revealed six key strategies which would help to equip pre-school children with social/behavioural, as well as cognitive, skills to help them through key transitions. These were:

1. Quality of adult-child interactions: encourage sustained one-to-one 'shared thinking' between adults and children, together with adult modelling and open-ended questioning.
2. Child-initiated play and teacher-initiated group work: work towards an equal balance.
3. Knowledge of the curriculum: ensure that pre-school workers have comprehensive curriculum knowledge.
4. Understanding of child development: improve child development component of initial and CPD pre-school courses.
5. Adult skills to support children and less-qualified staff: aim for a good proportion of trained teachers amongst the staff in pre-school environments.
6. Parent engagement in children's learning: involve parents in decision making related to educational aims and learning programmes.

Sanders *et al*. (2005) identified specific transition strategies that could ease the passage for children moving from the play-based environment of Reception into the more formal Year 1:

- Communication between Foundation and Year 1 teachers, relating to meeting the needs of individual children.
- Continuity of pedagogical approach to routines, expectations and activities in Reception and Year 1.
- Additional support for children who are less mature or less able than their classmates, or who have SEN or English as an additional language (EAL).
- Opportunities for Year 1 children to engage in play-based activities.
- School-home communication in preparation for transition to Year 1.
- Guidance for parents on how to support children's learning in Year 1.
- Induction visits to Year 1 for Reception children.
- More provision for training about this transition, including support for teachers in how to introduce appropriate literacy and numeracy activities.
- Further research to broaden the evidence base on effective transition practices.

Transition during the middle years

Galton, Morrison and Pell (1999) suggest that more attention needs to be directed towards transitions from one year to another as pupils move through the middle years of each Key Stage. In particular, the views of the pupils need to be elicited regarding how they visualise the next year. It is suggested that at each year-to-year progression point pupils should be

helped to visualise the next year in such a way that fosters excitement in relation to opportunities for extending learning and increasing responsibility.

Using the common baseline of KS1 assessments for a cohort of approximately 10,000 primary pupils, Minnis *et al*. (1998) estimated the progress pupils had made by the end of Year 3, the end of Year 4 and the end of Year 5. The evidence from this study suggests that patterns of performance vary considerably from school to school and are cumulative; the consequences of transition experiences may thus have far-reaching consequences for latter stages of schooling.

Attention has been drawn to the particular issues associated with transition from Year 2 to Year 3 (KS1– KS2), which potentially involves moving from an infant school site to junior school site and furthermore requires adaptation to a new pedagogical approach, particularly in respect of literacy (Doddington *et al.* 1999). It is suggested that in some schools priority is given to dedicating resources to Year 2, when National Curriculum tests are taken; pupils may thus perceive Year 3 as a less important year and respond accordingly by under-performing. Teachers in Doddington's study also put forward the view that Year 3 is a stage where pupils commonly engage in forming new social groups and that there is a danger such groups may develop anti-work norms. Furthermore, it was suggested that a dip in progression at Year 3 could be interpreted as a reflection of pupils reverting to their normal levels of attainment following artificially inflated Year 2 test results (*ibid*).

Transition from Key Stage 2 to Key Stage 3

Transition from primary to secondary school (KS2 – KS3) can be particularly challenging as it involves transfer to new social contexts and physical school environments, together with transition from one pedagogy and curriculum to another (Lucey & Reay 2000; Measor & Woods 1984; Bryon & Sims 2002; Capel *et al*. 2004). Galton *et al*. (2000: 341) suggest that, whilst many schools have successfully implemented induction strategies which alleviate anxiety amongst pupils and parents, it is still the case that around 40 per cent of pupils experience a 'hiatus in progression' at this point in their school careers. This hiatus, Galton claims, may be attributable to discontinuity in the curriculum and variations in teaching practice between KS2 and KS3. Bryon and Sims (2002) suggest that problems with progression may be addressed at least in part with collaborative networking amongst KS2 and KS3 teachers and the use of cross-phase bridging units of work. However, Galton *et al*. (2000) make the salient point that current educational systems, for example whereby parents may choose schools outside of their catchment area, undermine efforts to achieve continuity through liaison amongst pyramids or clusters of primary and secondary schools.

Four main problem areas related to the primary-secondary transition have been identified (Braund & Hames 2005; Bolster *et al*. 2004; OfSTED 2002; Lucey & Reay 2000). These are 1) insufficient increase in challenge of work tasks for pupils; 2) difficulties in adjusting to change in learning and social cultures; 3) failure to make use of pupils' previous learning and attainment; and 4) distrust amongst teachers of primary performance assessments gained through national testing.

There is some evidence that cross-phase units of work contributed to improving progression, continuity and positive pupil attitudes before and after transition (Braund & Hames 2005). However, some researchers (Capel *et al*. 2004; Bolster *et al*. 2004) suggest that liaison strategies between KS2 and KS3 tend to focus on literacy, numeracy and science, possibly to the detriment of subjects such as physical education and languages. In order for Year 7 teachers to capitalise on their pupils' previous learning, greater standardisation across the primary curriculum and collaboration and continuity between primary clusters and secondary schools are suggested.

Support for at-risk pupils

The transition from primary to secondary school can be a particularly difficult time for disaffected pupils or those who are at risk of exclusion from school (Hallam & Rogers, in press). At-risk groups include those on free school meals, pupils with special educational needs, pupils less fluent in English, and pupils from some ethnic groups (Minnis *et al*. 1998; Galton *et al*. 1999). Buddying schemes that link at-risk Year 6 pupils with Year 7 pupils have been implemented successfully in some UK Local Authorities (Galton *et al*. 2003). Furthermore, the use of Learning Mentors to support transition has become more widespread (Hallam & Rogers, in press). Hallam and Rogers (*ibid*) suggest that good practice in the support of pupils at risk of exclusion during the transition process includes interventions that begin prior to transition and continue for long enough to enable the pupil to settle in to the new environment. Furthermore, liaison between primary and secondary Special Educational Needs Coordinators (SENCOs) facilitates the setting up of support structures that meet individual needs from day one in the new school.

Key transition issues

There is much scope for further systematic evaluation of the impact of transition strategies on the progress and attitudes of pupils. Three broad areas have been identified: cumulative effects, communication, and continuity (Galton *et al*. 2003).

First, the possible cumulative nature of transition has been identified and demands further investigation. Research is needed that focuses on Early Years transitions as well as year-to-year transitions throughout primary school, with a view to developing effective transition strategies as well as strategies that could possibly interrupt established patterns of negative transition experiences and replace these with accumulated positive experiences. In particular, the impact of quality pre-school provision on successful transition needs to be further investigated, as does the role which home learning environments play in helping children negotiate transition from Early Years contexts through Key Stages 1 and 2.

Second, communication between pre-schools, primary schools and families have been shown to be a crucial factor in successful transition. School policies and practice relating to communication need to ensure that simple, reassuring messages are conveyed to pupils and parents/carers about key transitions and that pupils and parents/carers are involved in decision-making relating to possible actions to deal with challenging transitions.

A third but related issue is concerned with eliciting the views of pupils themselves. It has been suggested that, from the very earliest transition points, enhanced outcomes have been promoted when children have been encouraged to articulate their ideas about the upcoming year and when transition strategies have addressed the academic and/or social concerns of pupils as well as those of teachers and parents/carers. Research in this vein, giving attention to pupils' accounts of why they disengage or under perform at key transition points, has the potential to provide a valuable insight into how children approach and experience primary school transitions and could inform strategies that help to prepare pupils for significant changes in teaching approaches between Key Stages.

A further issue related to communication is that of continuity. It has been demonstrated that transition is a gradual process that is best negotiated by pupils when information transfers ahead of the pupil. In particular, pupils are helped to become professional in their approaches to learning when schools are able to respond to information relating to prior learning as well as special education needs or risks. Further research in this area has the potential to inform policies related to continuity of the curriculum and teaching at each of the identified primary transition points.

Finally, much transition work promoting curriculum continuity has focused on core subjects. Research is needed that would investigate the potential value in directing transition strategies at non-core subjects, potentially helping schools to engage in the development of inclusive teaching and learning strategies in particular subject areas that will help pupils sustain their excitement in learning.

THE EDUCATIONAL EFFECTS OF CLASS SIZE DIFFERENCES

Introduction

There has been a vigorous debate about the educational effects of class size differences in primary schools. Though there is consensus among many in education that smaller classes allow a better quality of teaching and learning, and that this a main reason why parents pay to send their children to private schools, others argue that the effects are modest and that there are other, more cost-effective strategies for improving educational standards (Slavin 1987; Rivkin, Hanushek & Kain 2000).

In a review for the National Commission on Education, Mortimore and Blatchford (1993) pointed out that, unusually in an international context, UK class sizes were larger on average in primary than in secondary schools, turning on its head what seems sensible educationally. Politically, in some countries at least, the policy tide has changed in favour of small classes. Current UK Government policy is for a maximum class size of 30 at Reception and KS1 in England and Wales. Class size reductions have been implemented by a number of US States, most notably in California where huge funds were made available. There have been initiatives involving class size or pupil to adult ratio reductions in the Netherlands, and in Asia Pacific countries as diverse as New Zealand and China.

It needs to be recognised that there is still a lot of variability in class sizes in the UK, even during the first three years of schooling. Many teachers would consider that 29 children in a class, especially when only 5–7 years of age, is still too many. Policy is still contentious, with opposition parties claiming that class sizes overall have increased. The Liberal Democrat policy at the time of the 2001 election was that the Government should go further and reduce the maximum class size to 25 children.

Despite the important policy and practice implications of the topic, the research literature on the educational effects of class size differences has not been clear (Blatchford & Mortimore 1994). However, recent research and reviews provide some answers, and in this section we summarise research evidence, and address whether class size differences affect children's educational attainment and learning, and classroom processes like teaching and pupil behaviour. It draws on main reviews of research: Anderson (2000); Biddle and Berliner (no date); Blatchford and Mortimore (1994); Blatchford, Goldstein & Mortimore (1998); Blatchford, Russell and Brown (in press); Cooper (1989); Ehrenberg, Brewer, Gamoran and Willms (2001); Finn, Pannozzo and Achilles (2003); Galton (1998); Grissmer (1999) and Hattie (2005), and also the CSPAR study (see below).

Do class size differences affect children's educational attainment and learning?

Overall, it has been concluded that much previous research has not had designs strong enough to draw reliable conclusions (Blatchford, Goldstein & Mortimore 1998). It has long been recognised, for example, that simple correlational designs, which examine associations between a measure of class size or pupil teacher ratios on the one hand and measures of pupil attainment on the other, are misleading, because we often do not know whether the results can be explained by another factor, for example that poorer performing pupils are placed in smaller

classes. To arrive at sounder evidence, two kinds of research design have been used. In this section we concentrate on two studies which represent each approach.

Experimental studies

It is often assumed that the problems of correlational research are best overcome by the use of experimental research or randomised controlled trials. This is one reason for the great attention paid to the Tennessee STAR project. A cohort of pupils and teachers at Kindergarten through to Grade 3 were assigned at random to three types of class within the same school: a small class (around 17 pupils), a 'regular' class (around 23 students) and a regular class with a teacher-aide. In brief, the researchers found that in both reading and maths pupils in small classes performed significantly better than pupils in regular classes, and children from minority ethnic group backgrounds benefited most from small classes (Finn & Achilles 1999; Nye *et al.* 2000). Although some aspects of the project are still contentious (see Goldstein & Blatchford 1998; Grissmer 1999; Hanushek 1999; Mitchell *et al*. 1991; Prais 1996), reanalysis of the data, using more sophisticated techniques, supported the central finding of a difference between small and regular classes (Goldstein & Blatchford 1998) but showed that the main effect was restricted to the first year of school. In fourth grade the pupils returned to regular classes and the experiment ended, but gains were still evident after a further three years, that is, Grades 4 - 6 (Word *et al*. 1990).

Longitudinal studies

There are some difficulties with experimental studies (see Goldstein & Blatchford 1998) and an alternative approach is to set up longitudinal studies, which measure the full range of class sizes and which account statistically for other possibly confounding factors (including pupil differences at an earlier point). This was the approach adopted in a large scale UK study; the Class Size and Pupil Adult Ratio (CSPAR) project, see for example Blatchford (2003), Blatchford, Bassett and Brown (2005); and Blatchford, Bassett, Goldstein and Martin (2003). This project tracked over 10,000 pupils in over 300 schools, from school entry (at 4/5 years) to the end of the primary school stage (11 years). It used a multi-method approach and sophisticated multi-level regression statistical analyses. In brief it found the following.

Class size and pupil progress. There was a clear effect of class size differences on children's academic attainment over the Reception year, in both literacy and maths, even after adjusting for other possible confounding factors. The effect is comparable to that reported by the STAR project, and this trend is therefore supported by both experimental and non-experimental research designs.

Who benefits? Small classes (below 25) worked best in literacy for children who were most in need academically, that is to say those with the lowest school entry scores and who had the most ground to make up. For the purposes of analysis, pupils were split into three ability groups, based on their pre-Reception year literacy scores (bottom 25 per cent, middle 50 per cent and top 25 per cent). There was a strong and statistically significant increase in attainment for all three groups, although below 25 in a class there was a larger effect for pupils with lower baseline attainment.

Benefits for how long? The effects of class size in the Reception year were still evident on literacy progress at the end of the second year of school (Year 1), though by the end of the third year the effects were not clear. There were no clear longer-term effects of class size differences on mathematics achievement. Though this indicates that the early benefits 'wash out' after two years in school, there were no restrictions in terms of which size of class they moved to from year to year (in contrast with the STAR project).

'Disruption' effect. The CSPAR's naturalistic design captured changes in class sizes from year to year. The biggest changes took place between Reception and Year 1 and an important

'disruption' effect on children's educational progress was found. The effect of small Reception classes carried over into Year 1 only when children moved into a similar or smaller class. Moving to a class of a different size, especially a larger class, had a negative effect on progress.

Do class size differences affect classroom processes like teaching and pupil behaviour?

Despite the widely held view that small classes will lead to a better quality of teaching and learning, the research evidence is not clear. One reason for this is the often anecdotal nature of the evidence collected. Overall, research suggests that class size effects are likely to be not singular but multiple and that it is difficult to capture all the possible complexities involved. But as a way of summarising and integrating data on classroom processes related to class size differences, we have prepared the following (see Blatchford, Russell & Brown (in press) for a more extended account). This again draws on the CSPAR because it is one of the few systematic UK studies on classroom processes available.

Within class groups

For much of their time in UK primary schools children are seated and work in groups. The CSPAR results showed that larger classes led to more and bigger groups in the class. In class sizes over 25 there is more likelihood of a pupil being in a large group of 7-10. The qualitative analyses showed this had an adverse effect on the amount and quality of teaching and the quality of pupils' work and concentration in these groups. It is therefore important educationally to consider the mediating role of within-class groupings.

Effects on teachers

Perhaps the most consistent finding is that the most important classroom process, affected by class size, is individualisation of teaching. The smaller the class the more likelihood there is that a teacher will spend more time with individual pupils. In smaller classes there also tends to be more teaching overall, and large classes present more challenges for classroom management, pupil control and marking, planning and assessment. Teachers are put under more strain when faced with large classes. Qualitative studies suggest that in smaller classes it can be easier for teachers to spot problems and give feedback, identify specific needs and gear teaching to meet them, and set individual targets for pupils. Teachers also experience better relationships with, and have more knowledge of, individual pupils.

Effects on pupils

Finn *et al*. (2003) conclude that students in small classes in the elementary grades are more engaged in learning behaviors, and that they display less disruptive behavior than do students in larger classes. The CSPAR study found more disengagement in the case of 4/5 year old pupils when working on their own. However, it found no effects on pupil attentiveness in 10/11 year old pupils, possibly because of assessment and curriculum pressures at that age. The CSPAR study showed that in large classes pupils were more likely to simply listen to the teacher and not be singled out by her; they are one of the crowd. Conversely, in smaller classes pupils were more likely to interact in an active way with teachers through initiating, responding and sustaining contact.

It might be expected that in larger classes pupils would turn to each other and pupil-pupil interactions would increase. In the CSPAR there was more pupil-pupil interaction overall in larger classes in the early years of primary education but by the later primary school years there was no evidence for such an effect, probably because of the assessment and curriculum pressures just mentioned. Interestingly, the CSPAR did not find that pupils in smaller classes had better peer relations; indeed, if anything, peer relations were worse.

Curriculum effects

Research has begun to show a moderating role of school subject on relationships between class size and classroom processes. Rice (1999) found that in mathematics, but not science, as class size increased less time was spent on small groups and individuals, innovative instructional practices, and whole group discussions. In the CSPAR study, the overall effects of class size on individualised attention were found in all subjects but English. One direction for future research is to identify more precisely ways in which class size effects vary in relation to particular school subjects and student age.

Overall, results suggest that while small classes will not make a bad teacher better, they can allow teachers to be more effective; conversely, large classes inevitably present teachers with difficulties and the need for compromises. Small classes can offer *opportunities* for teachers to teach better (Anderson 2000) or, to use a different term, they can create *facilitating conditions* for teachers to teach and students to learn (Wang & Finn 2000).

DISCUSSION

In this survey we have examined recent research, mainly in the UK, to identify what is known about different grouping arrangements in schools, the factors influencing these arrangements, and the impact they have on pupil learning and adjustment. It distinguishes between grouping at the class and the within class level. In general it argues that both levels are important but that the latter is likely to be more directly important for pupil learning. It also addresses research on problems of coherence, transitions and continuity within and between phases, and research evidence on the educational benefits of small classes.

In this final section we summarise main points arising out of each section, and identify implications for policy and practice, and suggestions for future research.

Overview of main methodological traditions

In the UK there is a strong tradition of descriptive research within primary schools and classrooms. These studies include naturalistic observation in classrooms that reveals how teachers organise the class and interact with children.

Case studies provide useful information on factors that may mediate the effects of school and classroom organisation on teachers and pupils. They highlight school policy, ethos, the deployment of resources, teachers' classroom practice and the nature of tasks pupils undertake as factors that mediate the impact of pupil grouping on children's learning, adjustment and attainment.

Survey research provides evidence on the overall pattern of school and class sizes and the nature and extent of different forms of grouping in primary schools. This allows us to establish trends over time and draws attention to the constraints and opportunities imposed by school size, which tends to affect the extent of particular forms of organisation such as setting and cross-age grouping.

For practical reasons there are few randomised controlled experimental studies of school organisation or pupil grouping. Instead, many studies capitalise on existing differences between schools and classrooms. These studies run the risk of confounding variables that may co-exist with particular forms of organisation. However, sophisticated statistical techniques such as multi-level regression analysis can provide estimates of several school, classroom and individual factors simultaneously.

Strong research designs are able to provide evidence on the effects of school and classroom organisation on children's learning and other educational outcomes. Longitudinal studies are

needed to explore links between variables over time and to establish reciprocal effects. In view of the complexity of schools and classrooms, research methods must be carefully designed to uncover and take account of multiple factors that may interact with, or mediate, the effects of different school structures and pupil grouping arrangements. As the effects of grouping practices may be cumulative, there is also a need for sustained investment in longitudinal studies that follow children through the primary phase of education. The reviews presented in this section show that there is now a firm evidence base to provide a platform for systematic, longitudinal research on the effects of pupil grouping and group work, and how they are mediated in schools and classrooms. Following children through transitions from one year group or Key Stage to another allows researchers to tease out the relative effects of several factors. Qualitative methods can be valuable, especially when they allow students' and teachers' voices to be heard, and may be fruitfully combined with quantitative methods. Future research should not focus solely on children's attainment but should consider other outcomes such as health and wellbeing, social adjustment, motivation and attitudes to learning.

Structured grouping practices

Overall, primary schools have tended to resist the introduction of structured ability grouping, preferring within-class groupings. Most primary school children are taught in mixed-ability classes with within-class ability groups for some subjects. Setting is relatively rare, tending to occur in the higher year groups and for those subjects which are subject to national assessment, particularly mathematics.

Approximately 25 per cent of pupils are taught in mixed age classes. These offer similar challenges to teachers as mixed-ability classes in relation to curriculum organisation, ability range, and assessment.

Issues that schools consider when making decisions about grouping structures relate to:

- learning (differentiation, raising attainment, developing pupil skills and good behaviour, flexibility);
- teaching (planning and delivery of the curriculum, use of more whole class teaching);
- academic subject concerns (groupings for different subjects, making use of teacher expertise);
- school and cohort size (issues relating to mixed age classes, setting);
- resources (staffing, timetabling, space, teaching assistants/parents);
- evaluations of different grouping practices (perceived success, reduction in class teacher contact time, time lost in movement between sets).

The arrival of a new headteacher can facilitate change, while parents can also be influential. The ability-grouping structures adopted also tend to reflect the ethos of the school.

The evidence, nationally and internationally, regarding the impact of structured ability grouping on attainment suggests that there are no consistent effects. The quality of the teaching seems to be the most important factor in determining pupil outcomes, not whether they are taught in structured or mixed ability groups. Nevertheless, when structured ability grouping practices are adopted, the quality of the teaching in the different groups can vary. Children in the top groups tend to work at a faster pace, have differential access to the curriculum, benefit from enhanced learning opportunities, and teachers have high expectations of them. For children in the lower groups topics may be omitted, there are lower expectations, and activities may be restricted. Teachers believe that they are matching

instruction to the level of the students' ability but the evidence suggests that many pupils find the work they are given is inappropriate; often it is too easy.

Pupils are aware of the grouping structures adopted in their schools, the reasons for them, their advantages and disadvantages, and accept the rationales provided. Pupils are socialised into the values of the school as established by teachers and accepted by parents. Structured groupings legitimise and make more transparent differences in pupils' attainment. Children in the lower and higher groups may experience teasing, and in the lower groups stigmatisation. There are no consistent effects on self-concept, or on social mixing, although pupils perceive that they help each other more in mixed ability settings.

The adoption of structured ability groupings therefore has no positive effects on attainment but has detrimental affects on the social and personal outcomes for some children. Moreover, the allocation of pupils to groups is a somewhat arbitrary affair and often depends on factors not related to attainment. In theory, movement between groups is possible but in practice it is frequently restricted. This limits the opportunities for some children. Grouping pupils within the class in different ways for different activities offers more flexibility, facilitates movement between groups structured by ability, and avoids limiting the opportunities for some children. It would help for teachers to tailor work more specifically to pupil needs, adopting within-class groupings to do this while also being mindful that pupils' attainment levels do not follow a stable trajectory. Groupings need to be constantly reviewed to take account of this. They should also vary groupings dependent on the nature of the task, avoiding children labelling themselves as being in one specific group. Future research needs to address how such flexibility can best be developed in classrooms and what its impact is on pupils and teachers.

Within-class grouping

In all British classrooms, pupils are grouped in some form but research has shown that, in general, little group work takes place and still less is of good quality. A number of studies suggest pupils are most likely to be seated in an arrangement that does not facilitate their learning of specific tasks – and may actually inhibit their learning. Pupils may sit *in* groups but rarely interact and work *as* groups. Importantly, groups in classrooms are often formed without a strategic view of their purpose, and there is little support for pupil-pupil interactions within groups. Pupils and teachers are not trained for group-work and have doubts about, and difficulties implementing, it in classrooms. Instead, pupils tend to work individually or as a whole class. There is then a wide gap between the potential of group work to affect pupil achievement, motivation and classroom behaviour, and its limited use in schools.

The size of classes, size of within-class groups, composition of within-class groups, nature of the assigned learning task, intended social interaction used in task completion and teacher intervention appear to be related. Planning for effective learning needs to take account of the social pedagogic relationships between these factors. Research indicates that group work can be successfully used and implemented into everyday primary classrooms, provided teachers are aware of social pedagogical principles and take time to train pupils in the skills of group working. It also shows that involvement in group work, with support provided for relational and other group working skills, has positive effects on pupils' academic progress. Results indicate that within-class grouping, rather than class-level organisational grouping initiatives, may have greater potential to raise standards.

These results have implications for educational policy and practice. There are three main contexts for learning in any classroom: teacher-led work, individual work and interactions between pupils. Pressures arising from the curriculum and the classroom context mean a heavy emphasis on whole-class teaching followed by individual work, with little room for

group work. Teachers can feel unsatisfied with whole-class teaching, especially when they have a strong belief in the value of addressing the individual needs of pupils (Blatchford *et al*. 2006). We argue that the third context for learning – peer-based interactions, or 'co-learning' – has been neglected, certainly in the UK. We suggest that, given space and time to develop pupils' group working skills, teachers can bring about a transformation in the teaching and learning environment. It offers learning possibilities for pupils not provided by either teacher-led or individual work, and can contribute to national concerns with engagement in learning and attitudes to work and classroom behaviour. On the basis of evidence reviewed here, group work deserves to be given a much more central role in educational policy and school practice.

Research indicates that effective interventions may need to vary according to age of pupil and curricular area, and more research on these influences would be helpful. There is also a strong indication from the SPRinG research that implementation of good quality groupwork works best when part of a whole school initiative; future research could do well to examine more fully whole-school processes that can best support and sustain group work.

Transitions

Further research is needed that would investigate how knowledge and practices relating to communication and curriculum continuity at each of the primary transition points may be drawn upon to facilitate these transitions. Furthermore, the concept of the effects of transition as being cumulative suggests that there is much scope for further development of transition strategies targeting Early Years and Key Stage 1 to 2 transitions, as well as year-to-year transitions throughout primary school.

The potential cumulative nature of transition suggests that directing research and resources at the earliest primary transitions could have long-term implications for pupils' successful negotiation of transition at subsequent stages of school careers. In particular, the impact of quality pre-school provision on successful transition has been identified and needs to be further investigated. Furthermore, the quality of home learning environments has been shown to comprise an important protective factor against the subsequent development of SEN, suggesting that initiatives whereby parents could be helped to improve the quality of the home learning environment would be valuable.

The extent and quality of communication amongst pre-schools, primary schools and families has been shown to impact considerably on successful transition. Research that would promote policy and good practice in the area of communication is needed. Specifically, pupils as well as professionals and parents/carers need to be involved in any such research, with a view to addressing the concerns of all parties and taking account of each perspective when formulating possible actions to deal with challenging transitions.

Finally, curriculum continuity has been shown to play a key role in successful transition. The development of consistent policies relating to the quality and quantity of transfer of information is needed, as are strategies to help teachers take account of pupils' prior learning and special needs. These strategies should not be restricted to core subjects; research is needed that would acknowledge the potential benefits, in terms of inclusion and sustaining interest in learning, in directing transition strategies at non-core subjects.

Class size

Policy implications

The STAR and CSPAR projects show we need to take account of the age of the child when considering class size effects. There is a clear case for small class sizes in the Reception year, but results show where resources could be further targeted; that is at classes smaller than 25

for those with the most ground to make up in literacy skills. Another policy implication is to maintain smaller classes across years where possible.

Age versus start-up effect?

Results also suggest that class size reduction initiatives are best seen as a policy of prevention but not remediation, in the sense that the evidence supports the use of small classes immediately after entry to school but there is little evidence that small classes introduced later in children's school lives are as effective. However, there is still the possibility that smaller classes may be advantageous at later strategic points of transition in student's school lives, for example in the first year of secondary education. Research evidence on this possibility is needed.

Alternatives to class size reduction (CSR)

Hattie (2005) argues that we should consider effects of class size not in relation to zero – that is, having no effect – but in comparison with other interventions, for example tutoring, phonics training, and 'Success for All'. In general, CSR does not do well in these comparisons. But is this a fair test? It should be no surprise that reducing class sizes in and of itself does not result in gains in student achievement as obvious as those stemming from involvement in a defined educational intervention. A fairer test is to compare it with effects of other, alternative classroom contextual changes. Blatchford, Russell and Brown (in press) have considered three alternatives: reduced pupil-teacher ratios (PTRs), an increase in teaching assistants (TAs), and flexibility in Classroom Grouping, and suggest that these are no better than CSR and involve difficulties not always taken into account. Overall, though, there is a need for studies to compare systematically different contextual approaches.

Implications for practice

It has often been pointed out that teachers do not necessarily change the way they teach when faced with smaller classes and that this might well account for the relatively modest effects of class size on achievement. Blatchford, Russell and Brown (in press) have suggested several ways in which CSR can be accompanied by pedagogical changes to enhance beneficial effects for students, for example taking advantage of the possibilities of increased individualisation; adopting more adventurous and flexible teaching; and implementing more effective collaborative learning between pupils. Some have argued that teacher professional development is a better investment than CSR, but it is better not to see them in opposition. Rather, professional development should be used to help teachers harness the opportunities of small classes, and help teachers develop strategies for realising educational objectives in large classes.

CONCLUSION

Over the long history of research into school structure and classroom grouping, there has been little transfer between research findings and wide-spread classroom application. One reason for this is the methodological difficulty of establishing clear effects, for example of grouping practices in schools. But another reason is that concerns about underachievement, lack of pro-school attitudes and exclusion have tended to be approached by calls for more differentiation by ability of attainment. This review has made it clear that such moves are not supported in the research literature. Indeed, differentiation by ability/attainment has been associated with limited access to knowledge by some pupils, domination of pedagogic practices by teachers, preferred teachers for 'elite' pupils and enforcement of social divisions among pupils.

A great amount of effort has gone into curriculum development and recommendations for school/classroom structure, but much more effort now needs to be directed to the consideration and development of classroom-based social pedagogy (including the effective use of pupil groupings). It is more important for teachers to prepare their pupils to work effectively together, for example in their classroom groups, and to use these within-class groups flexibly. When teachers put a long-term commitment (up to a year) into developing relational and other social pedagogic practices within their classrooms, pupils respond with improved attainment, classroom behaviours and pro-learning attitudes.

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APPENDIX 1

THE PRIMARY REVIEW PERSPECTIVES, THEMES AND SUB THEMES

The Primary Review's enquiries are framed by three broad perspectives, the third of which, primary education, breaks down into ten themes and 23 sub-themes. Each of the latter then generates a number of questions. The full framework of review perspectives, themes and questions is at www.primaryreview.org.uk

The Review Perspectives

P1 Children and childhood
P2 Culture, society and the global context
P3 Primary education

The Review Themes and Sub-themes

T1 Purposes and values
- T1a Values, beliefs and principles
- T1b Aims

T2 Learning and teaching
- T2a Children's development and learning
- T2b Teaching

T3 Curriculum and assessment
- T3a Curriculum
- T3b Assessment

T4 Quality and standards
- T4a Standards
- T4b Quality assurance and inspection

T5 Diversity and inclusion
- T5a Culture, gender, race, faith
- T5b Special educational needs

T6 Settings and professionals
- T6a Buildings and resources
- T6b Teacher supply, training, deployment & development
- T6c Other professionals
- T6d School organisation, management & leadership
- T6e School culture and ethos

T7 Parenting, caring and educating
- T7a Parents and carers
- T7b Home and school

T8 Beyond the school
- T8a Children's lives beyond the school
- T8b Schools and other agencies

T9 Structures and phases
- T9a Within-school structures, stages, classes & groups
- T9b System-level structures, phases & transitions

T10 Funding and governance
- T10a Funding
- T10b Governance

APPENDIX 2

THE EVIDENTIAL BASIS OF THE PRIMARY REVIEW

The Review has four evidential strands. These seek to balance opinion seeking with empirical data; non-interactive expressions of opinion with face-to-face discussion; official data with independent research; and material from England with that from other parts of the UK and from international sources. This enquiry, unlike some of its predecessors, looks outwards from primary schools to the wider society, and makes full though judicious use of international data and ideas from other countries.

Submissions

Following the convention in enquiries of this kind, submissions have been invited from all who wish to contribute. By June 2007, nearly 550 submissions had been received and more were arriving daily. The submissions range from brief single-issue expressions of opinion to substantial documents covering several or all of the themes and comprising both detailed evidence and recommendations for the future. A report on the submissions will be published in late 2007.

Soundings

This strand has two parts. The *Community Soundings* are a series of nine regionally based one to two day events, each comprising a sequence of meetings with representatives from schools and the communities they serve. The Community Soundings took place between January and March 2007, and entailed 87 witness sessions with groups of pupils, parents, governors, teachers, teaching assistants and heads, and with educational and community representatives from the areas in which the soundings took place. In all, there were over 700 witnesses. The *National Soundings* are a programme of more formal meetings with national organisations both inside and outside education. National Soundings A are for representatives of non-statutory national organisations, and they focus on educational policy. National Soundings B are for outstanding school practitioners; they focus on school and classroom practice. National Soundings C are variably-structured meetings with statutory and other bodies. National Soundings A and B will take place between January and March 2008. National Soundings C are outlined at 'other meetings' below.

Surveys

30 surveys of published research relating to the Review's ten themes have been commissioned from 70 academic consultants in universities in Britain and other countries. The surveys relate closely to the ten Review themes and the complete list appears in Appendix 3. Taken together, they will provide the most comprehensive review of research relating to primary education yet undertaken. They are being published in thematic groups from October 2007 onwards.

Searches

With the co-operation of DfES/DCSF, QCA, Ofsted, TDA and OECD, the Review is re-assessing a range of official data bearing on the primary phase. This will provide the necessary demographic, financial and statistical background to the Review and an important resource for its later consideration of policy options.

Other meetings (now designated National Soundings C)

In addition to the formal evidence-gathering procedures, the Review team meets members of various national bodies for the exchange of information and ideas: government and opposition representatives; officials at DfES/DCSF, QCA, Ofsted, TDA, GTC, NCSL and IRU; representatives of the teaching unions; and umbrella groups representing organisations involved in early years, primary education and teacher education. The first of three sessions with the House of Commons Education and Skills Committee took place in March 2007. Following the replacment of DfES by two separate departments, DCSF and DIUS, it is anticipated that there will be further meetings with this committee's successor.

APPENDIX 3

THE PRIMARY REVIEW INTERIM REPORTS

The interim reports, which are being released in stages from October 2007, include the 29 (initially 30) research surveys commissioned from external consultants together with reports on two of the Review's many public consultations: the community soundings (87 regional witness sessions held during 2007) and the submissions received from organisations and individuals in response to the invitation issued when the Review was launched in October 2006. The research surveys are listed below by Review theme, not by the order of their publication. Once published, each report, together with a briefing summarising its findings and overviews and press releases for each group of reports, may be downloaded from the Review website, www.primaryreview.org.uk.

REPORTS ON PUBLIC CONSULTATIONS

Community soundings: the Primary Review regional witness sessions.

Submissions received by the Primary Review.

REPORTS ON THE SURVEYS OF RESEARCH AND OTHER PUBLISHED EVIDENCE

THEME 1: PURPOSES AND VALUES

1/1 *Aims as policy in English primary education*, by John White, University of London Institute of Education.

1/2 *Aims and values in primary education: England and other countries*, by Maha Shuayb and Sharon O'Donnell, National Foundation for Educational Research.

1/3 *Aims for primary education: the changing national context*, by Stephen Machin and Sandra McNally, University College London and London Schools of Economics and Political Science.

1/4 *Aims for primary education: changing global contexts*, by Hugh Lauder, John Lowe and Rita Chawla-Duggan, University of Bath.

THEME 2: LEARNING AND TEACHING

2/1a *Children's cognitive development and learning*, by Usha Goswami, University of Cambridge, and Peter Bryant, University of Oxford.

2/1b *Children's social development, peer interaction and classroom learning*, by Christine Howe and Neil Mercer, University of Cambridge.

2/2 *Primary teaching and teachers*, by Robin Alexander and Maurice Galton, University of Cambridge.

2/4 *Learning and teaching in primary schools: insights from TLRP*, by Mary James and Andrew Pollard, University of London Institute of Education.

THEME 3: CURRICULUM AND ASSESSMENT

3/1 *Curriculum and assessment policy: England and other countries*, by Kathy Hall, National University of Ireland, and Kamil Øzerk, University of Oslo.

3/2 *The trajectory and impact of national reform: curriculum and assessment in English primary schools*, by Dominic Wyse, University of Cambridge, and Elaine McCreery and Harry Torrance, Manchester Metropolitan University.

3/3 *Primary curriculum futures*, by James Conroy, Moira Hulme and Ian Menter, University of Glosgow.

3/4 *The quality of learning: assessment alternatives for primary education*, by Wynne Harlen, University of Bristol

THEME 4: QUALITY AND STANDARDS

4/1 *Standards and quality in English primary schools over time: the national evidence*, by Peter Tymms and Christine Merrell, University of Durham.

4/2 *Standards in English primary education: the international evidence*, by Chris Whetton, Graham Ruddock and Liz Twist, National Foundation for Educational Research.

4/3 *Quality assurance in English primary education*, by Peter Cunningham and Philip Raymont, University of Cambridge.

THEME 5: DIVERSITY AND INCLUSION

5/1 *Children in primary education: demography, culture, diversity and inclusion*, by Mel Ainscow, Alan Dyson and Frances Gallanaugh, University of Manchester, and Jean Conteh, University of Leeds.

5/2 *Learning needs and difficulties among children of primary school age: definition, identification, provision and issues*, by Harry Daniels and Jill Porter, University of Bath.

5/3 *Children and their primary schools: pupils' voices*, by Carol Robinson, University of Sussex, and Michael Fielding, University of London Institute of Education.

THEME 6: SETTINGS AND PROFESSIONALS

6/1 *Primary schools: the built environment*, by Karl Wall, Julie Dockrell and Nick Peacey, University of London Institute of Education.

6/2 *Primary schools: the professional environment*, by Liz Jones, Andy Pickard and Ian Stronach, Manchester Metropolitan University.

6/3 *Primary teachers: initial teacher education, continuing professional development and school leadership development*, by Olwen McNamara and Rosemary Webb, Manchester University, and Mark Brundrett, Liverpool John Moores University.

6/4 *Primary workforce management and reform*, by Hilary Burgess, Open University.

THEME 7: PARENTING, CARING AND EDUCATING

7/1 *Parenting, caring and educating*, by Yolande Muschamp, Felicity Wikeley, Tess Ridge and Maria Balarin, University of Bath.

THEME 8: BEYOND THE SCHOOL

8/1 *Children's lives outside school and their educational impact*, by Berry Mayall, University of London Institute of Education.

8/2 *Primary schools and other agencies*, by Ian Barron, Rachel Holmes and Maggie MacLure, Manchester Metropolitan University, and Katherine Runswick-Cole, University of Sheffield.

THEME 9: STRUCTURES AND PHASES

9/1 *The structure of primary education: England and other countries*, by Anna Riggall and Caroline Sharp, National Foundation for Educational Research.

9/2 *Classes, groups and transitions: structures for teaching and learning,* by Peter Blatchford, Susan Hallam and Judith Ireson, University of London Institute of Education, and Peter Kutnick, Kings College, University of London, with Andrea Creech, University of London Institute of Education.

THEME 10: FUNDING AND GOVERNANCE

10/1 *The funding of English primary education*, by Philip Noden and Anne West, London School of Economics and Political Science.

10/2 *The governance and administration of English primary education*, by Maria Balarin and Hugh Lauder, University of Bath.

The Primary Review is a wide-ranging independent enquiry into the condition and future of primary education in England. It is supported by Esmée Fairbairn Foundation, based at the University of Cambridge and directed by Robin Alexander. The Review was launched in October 2006 and aims to publish its final report in autumn 2008.

FURTHER INFORMATION

www.primaryreview.org.uk

General enquiries: enquiries@primaryreview.org.uk

Media enquiries: richard@margrave.co.uk

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