RESEARCH

The Effects of Pupil Grouping: Literature Review

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Executive Summary

This extended review of the literature on pupil grouping includes an analysis and synthesis of current and yet to be published research to identify types of grouping suited to particular pupils, the range of organisational policies regarding pupil grouping within schools that are related to different levels of performance and subjects suited to particular types of grouping. The review also considers how type of grouping may affect pupil learning and how the transition from primary to secondary school may be affected by various pupil groupings. This review of the literature draws upon studies undertaken in primary and secondary schools.

The literature review draws together school-based information on 'organisational' and 'within-class' grouping of pupils, as well as theoretical background and practical implementation issues. The methodology adopted used systematic procedures that include electronic and hand searching, mapping the research territory and quality-assuring the studies. This review identifies issues in the study of grouping, theories underlying grouping initiatives, the role of grouping practices in school transfer and the importance of teaching pupils to work in groups.

Key findings include:
Pupil grouping is often presented as a polemical debate between setting and mixed-ability teaching. The research evidence suggests that schools show a much wider range of grouping practices that vary with age of pupils (especially at transition into secondary schools) and curricular area. In addition, consideration of pupil grouping should include a variety of within-class groupings, and organisational and within-class grouping for both social and academic purposes. In order to explain evidence of associations between grouping, learning and social behaviour, the review suggests that school, department and classroom decisions regarding pupil grouping are more complex than a reflection of 'seating' arrangements. It should also be noted that within most of the existing literature on this subject there has been little attempt to disaggregate variables that 'confound' attainment such as social class, teacher perception (of attainment), school type, etc.

Both intervention and naturalistic studies concerning the impact of organisational pupil grouping practices suggest that no one form of organisational grouping benefits all pupils. In ability-based grouping, pupils in lower groups are vulnerable to making less progress, becoming de-motivated and developing anti-school attitudes. There is evidence that these pupils experience poorer quality of teaching and a limited range of curricular and assessment opportunities likely to have an impact on later life chances.

Within-class grouping, found in any context of organisational grouping, may have greater potential to raise standards through personalising the learning experience for pupils, especially enhancing the benefits of heterogeneous organisational grouping effects.

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 relationship between these factors, especially between group size, composition and the type of learning task assigned. The commonly held view that the role of friendship should be central to within-class group composition, especially during school transition, is challenged by the literature.

Issues relating to group work can enhance or inhibit effective transfer from primary to secondary schools. The timing of information from tests influences organisational grouping practices and potentially increases the use of additional internal tests in year 7. There is no

clear evidence suggesting that one form of organisational grouping in year 7 is more effective either in promoting desired academic or social outcomes. There is some evidence that movement between groups, whatever the basis of organisational grouping, becomes less frequent throughout Key Stage 3.

The evidence is patchy concerning the impact of grouping strategies on pupils with specific characteristics. For pupils identified as gifted and talented, full time specialist programmes and constructing separate groups within a mixed class taught by someone specifically trained are effective in academic gains for these pupils but the effects on the other pupils in the class and school remain unknown.

Evidence on gender suggests that boys are over-represented in lower sets. There is (non-comparative) evidence from one study that selective single-sex teaching in some subjects can benefit boys in English and modern languages and girls in science and mathematics, under particular conditions.

Pupils from some minority ethnic groups and pupils with SEN are over-represented in lower sets. There is a dearth of research evidence on the effects of organisational grouping on either of these groups of pupils but there is some evidence of the potential benefits of flexible organisational grouping and within-class grouping that allow for the effective deployment of teaching assistance for pupils with SEN – although consideration should be given as to whether this assistance is provided by a teaching assistant or classroom teacher.

There is very limited research on the differential effects in different subjects of either organisational or within-class grouping. However, one study shows that the stronger effects of setting in mathematics, which limit the progress of lower attaining pupils while enhancing that of higher attainers, are not apparent in English or science.

Recent studies of within-class grouping have sought to address the quality of social pedagogy by planning and undertaking theoretically informed interventions over time. These interventions involve teaching pupils group work skills and supporting teachers' use of group work, and the interventions have been associated with increased pupil attainment and changes in attitudes of pupils and teachers. Effective interventions may need to vary according to age of pupil and curricular area.

Key recommendations:
- Ensuring that policy and guidance on practice that relates to grouping acknowledges the wide range of practices that exist, the need for organisational grouping to be flexible and to be evaluated, and for teachers and schools to be responsive to emerging effects.

- Encouraging more explicit planning and evaluation of within-class grouping, taking account of possible relationships between pupil characteristics, group size, group composition, task and social interaction.

- Emphasising the importance of teaching and supporting group work skills for pupils and teachers and of the potential role of teaching assistants in this process;

- Exploring through further research how knowledge and practices of both organisational and within-class grouping may be drawn upon to facilitate transfer from primary to secondary schools, in particular to acknowledge the potential impact of friendship, gender and focus on pedagogy.

- Other future priorities for research might include the comparison of the effects of organisational grouping in different subjects; the effects of organisational and within-class grouping on pupils from minority ethnic groups, those identified as having SEN or as gifted and talented; and the longer term effects of 'training' pupils and school staff in group work strategies.

The Effects of Pupil Grouping at Key Stage (KS) 3

A   Purpose and procedure of the review

This review of pupil grouping was commissioned to focus upon Key Stage 3 but has been extended to Key Stages 1-4. It will explore organisational grouping found in secondary and primary schools, and the challenges of and opportunities provided by within-class grouping of pupils. The review will identify implications for policy, based upon the most recent evidence on pupil grouping (organisationally and at interactional levels within classrooms), and areas where further research could add substantially to our existing knowledge.

Information presented in this extended review has been identified for inclusion through procedures that include electronic and hand searching, mapping the research territory and quality-assuring the studies. The review sought to identify and, where appropriate, to evaluate empirical and theoretical studies concerning the practice of grouping pupils in schools; integrating a 'best evidence synthesis' (Slavin, 1986) with practical consideration of small-scale and innovative studies (in a manner described by Harlen & Malcolm, 1999). Studies cited mainly focus on recent empirical research (covering the last twenty years, but also draw upon key studies undertaken previously). The main inclusion criteria for studies cited were descriptions of practice or interventions, evaluations of outcomes and quality of studies. Think pieces and commentaries have not been included unless they make a clear contribution to the understanding of grouping, theoretically or in terms of evaluation. Furthermore, inclusion of studies that provide data on the effects of organisational grouping from one school only have, after careful consideration, been limited on the basis that it is too difficult to rule out other effects that may have contributed to the findings.

A majority of the studies of 'organisational' grouping were undertaken in England while within-class studies draw upon an international literature. In addition, as the main co-writers have undertaken extensive research studies in the area of pupil grouping (in both primary and secondary schools), information contained herein has been organised and structured on the basis of these studies. Finally, this review will also include results and insights from current studies undertaken by the co-writers; many of these results are awaiting publication in academic journals.

B   Studying organisational and within-class grouping: Three underlying themes

As this review will show, there are numerous studies undertaken in the UK and elsewhere, which attempt to investigate the grouping of pupils and the impact of these grouping strategies upon learning. Initially, the review will extract key themes from the complex literature on the topic and explore the rationale for grouping pupils within their schools, subject departments and classrooms. The review will show that differences exist between current practice and the potential for using pupil groups to enhance learning while in school. At the outset, this review identifies three underlying issues emerging from the existing literature. These issues are: school organisation, the differences between grouping and group work, and the importance of pupils' interpersonal and learning experiences.

B.1   School organisation
Various strategies have been used to group pupils into year groups, forms, and subject teaching groups. Throughout the review we refer to this type of grouping as organisational grouping. The nature and composition of such groups has been the source of heated debates for many years. These debates have often 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; a focus on type of ability grouping as an *organisational strategy* may divert consideration from what is happening within pupil groups in classrooms in relation to teaching, learning and attitudes. Nevertheless, it is useful to identify the types of organisational grouping contexts that pupils are likely to experience during their years of schooling.

The Ofsted data from inspections of secondary schools during 2001-02 and 2003-04 showed that less than 5% were 'streamed' (see Appendix 1 for definitions of organisational grouping), but many schools used ability-based setting to form classes in diverse curricular subjects. The amount of setting increased throughout Key Stage 3 from about 26 per cent in Year 7 to 44 per cent in Year 9 across all subjects in both inspection years. The different combinations of year group and subject group give rise to significant variations in practices across Key Stage 3 and into Key Stage 4.

Table 1 combines Ofsted 2001-2 and 2003-04 information (concerning organisational grouping across core and other subjects in Years 7 and 9) with data collected from 80 secondary schools in the South of England, covering Years 7 and 10 (Grouping in Secondary Schools [GRIS] project, Blatchford, Kutnick & Baines, 1999). The table shows that pupils will experience considerable variation in the way that teaching is organised due to differences across:

   a.   subjects: pupils are much more likely to be set in mathematics and science than in humanities, art, PE or music; and
   b.   year groups in school: only 26% of classes observed in Year 7 were set, while approximately 44% of classes were set in Year 9.

Table 1 also shows remarkable consistency in the amount of setting found in Key Stage 3 across school years and curriculum subjects. A sharp contrast is noted between setting in Key Stage 3 and that in Key Stage 2. In primary schools, approximately one-quarter of mathematics classes and one seventh of English classes are set, but further setting barely exists in other curricular subjects. From evidence reviewed by Harlen & Malcolm (1999), the number of schools using setting for Key Stage 2 mathematics is increasing at a slow pace.

Table 1: Proportion of pupils organisationally grouped by ability using data from Ofsted and the 'Grouping in Secondary Schools' (GRIS) study; by subject and year group

STUDY/ Subject	Ofsted 2001-2 (Years 7 and 9)	GRIS (Years 7 and 10)	GRIS (Year 7)	GRIS (Year 10)	Ofsted 2003-4 (Key Stage 3)	Ofsted 2003-4 (Key Stage 2)
Mathematics						
Set	82%	75%	53%	100%	83%	28%
Mixed	18%	25%	47%	0%	17%	72%
English						
Set	46%	47%	34%	63%	48%	15%
Mixed	54%	53%	66%	37%	52%	85%
Science						
Set	59%	61%	44%	83%	61%	2%
Mixed	41%	39%	56%	17%	39%	98%
MFL						
Set	58%	-	-	-	56%	-
Mixed	42%				44%	
Art, Music, PE						
Set	10%	-	-	-	11%	0.5%
Mixed	90%				88%	99.5%
Humanities						
Set	-	31%	37%	23%	18%	0.7%
Mixed		69%	63%	77%	82%	99.3%

B.2   Differences between grouping and group work: discontinuities in the way pupils sit and the way they are expected to work

When the focus is on within-classroom groupings of pupils, research mainly undertaken in primary schools describes classrooms where pupils are consistently found seated in small groups (usually consisting of an equal mix of boys and girls). In these descriptions of classroom organisation (such as Galton, Simon & Croll, 1980; Galton, Hargreaves, Comber, Wall & Pell, 1999), it appears that teaching and learning processes are undertaken in a variety of 'groupings' that include: whole class, large group (up to half of the class), small group, triads, dyads and individual. For the largest part of their classroom experience, pupils are seated in small groups (of 4 to 6 children around a table). However, these seating groups are rarely assigned learning (or communication) tasks that require group working – which may include cooperative (individual contributions to a shared goal) or collaborative tasks that engage all members of the group in an interdependent manner. In one particular example (Table 2), Galton & Patrick (1990) present a dramatic contrast between seating and working arrangements of pupils. We expect that similar findings may characterise classrooms in secondary schools, but too few studies currently exist to make such an assertion.

Assigning individual work/tasks to pupils who are seated in a small group is associated with actions such as drawing their peers 'off-task' via social conversations, threats and lack of sustained attention (Galton, 1990). The general lack of correspondence between seating/grouping and assignment of work/learning tasks has lead to a further analysis that explores social pedagogic implications of within-classroom learning.

Table 2: Galton & Patrick's (1990) relationship between seating and working arrangements in primary schools

GROUPING	SEATING ARRANGEMENT	WORK ARRANGEMENT
Small group	56.0%	5.0%
Dyads	16.0%	4.0%
Individual	7.5%	81.0%
Whole class	20.5%	10.0%

B.3.   The importance of pupils' interpersonal experiences

Social pedagogy concerns the relationship between classroom organisation and interpersonal experiences that may facilitate or inhibit school-based learning. Key elements in the consideration of social pedagogy of classrooms (see Kutnick, Blatchford & Baines, 2002; Blatchford, Kutnick, Baines & Galton, 2003) include size and composition of pupil groups, types of learning task assigned to these groupings, the nature and type of group interaction that a given task appears to facilitate and impact of the teacher's presence. One example of how social pedagogy may impact on learning concerns the relationship between group size and the assigned learning task. From a review of both experimental and naturalistic studies, Kutnick (1994; and see Table 3 in section D.1.2) was able to demonstrate that certain group sizes were more strongly associated with: a) the types of learning task, b) relationships among pupils in a group, and c) specific interactions. We note that Table 3 was based mainly on experimental studies undertaken with school-aged children; yet, a number of considerations can be drawn regarding matching group size with type of task, desired interaction for effective learning and the cyclic flow of a lesson. Further studies may be needed to ascertain whether similar effects can generalise to everyday classrooms.

These three issues, derived from the literature, highlight the need to recognise the complexity, theory and practice of pupil grouping when trying to understand the social pedagogical conditions of learning. There is no 'easy explanation' that can account for multiple forms of organisational grouping currently deployed in schools or the many other factors that may be found within classrooms. Even when accounting for organisational grouping practices, there will be complementary within-class processes that may inhibit as well as facilitate school-based learning.

C   Theories underlying the use of pupil groupings in classrooms

Beyond the historic and economic explanations for the existence of pupils groupings in schools, there are two main theoretical explanations that inform the grouping of pupils in classrooms. These are: 1) the possible enhancement of learning of pupils with other pupils and 2) social and 'socialisation' developments that may reduce the stratification effects of society (by social class, gender, race, ethnicity, etc.).

The review will stress that an understanding of effective group working is more extensive than setting up co-operative or ability dominated grouping and provides a more insightful basis for social pedagogy of classroom groups. Fundamental to the consideration of pupil grouping in classrooms is the identification of underlying theoretical issues within this field. This will help to understand the relationship between pupil grouping and classroom outcomes (both learning and social) and why certain 'practical' approaches to pupil grouping have been recommended and undertaken. Theoretical issues are thoroughly reviewed in Appendix 3.

Historically, and until relatively recently, a clear distinction existed between the more experimental approach to the study of grouping and group work adopted by researchers based in the United States (Slavin, 1987; Johnson & Johnson, 1994) and what might be termed 'naturalistic' classroom research which was a predominant feature of research in the UK over the last thirty years (Bennett, 1976; Galton & Williamson, 1992; Kutnick, Blatchford & Baines, 2002). However this distinction is no longer as clear, with recent studies that explore group work processes originating from the USA also moving more towards a 'naturalistic' classroom model (Webb & Mastergeorge, 2003) and quasi-experimental studies that compare existing group work practices with long-term, structured interventions in classes in the UK (Blatchford, Galton, Kutnick & Baines, 2005).

The theories and approaches described in Appendix 3 are divided between socially oriented training/processes and cognitively oriented processes/outcomes (with efforts made more recently to incorporate training for more effective communication – Mercer, 2000). Identifying that a divide exists between social and cognitive group working (theories and approaches) helps to explain: a) why a number of meta-analytic reviews (Kulik & Kulik, 1992; Slavin, 1987; Lou, Abrami, Spence, Poulson, Chambers & d'Apollini, 1996) of classroom studies find consistent social development but inconsistent learning/cognitive development among pupils, and b) why group working has only been used to limited effect as evidenced by naturalistic studies of classrooms. Explanations for consistent social gains in classroom studies draw upon social psychological theories and associated training to support development of group working. These social psychological theories do not focus on academic attainment but encourage development of interpersonal and interdependence skills. Only the cognitive studies focus on academic attainment. This separation between social and cognitive theories helps to explain why results from comparisons between cooperative/collaborative programmes versus traditional teaching methods may not show consistent academic differences.   On the other hand, these comparisons do show consistent improvement in pro-school attitudes and relational experience (in the forms of trust, sensitivity, empathy, etc.) for children in the cooperative/collaborative programmes.

While researchers such as Hartup (1998) have speculated that trust and sensitivity are fundamental to communication and cognitive skills, researchers that developed these theories (Allport, 1954; Deutsch, 1949; and others) were more concerned with means to promote democratic participation and overcoming prejudice in society. Limited effects of group working as seen in naturalistic studies of classrooms are explained by the fact that pupils are rarely trained in either social or cognitive group working skills. Also, in these naturalistic studies, group seating is most commonly associated with individual, practice-

oriented tasks – and these tasks fall outside the social and cognitive processes enhanced by the theories and approaches described above.

Cognitive and socio-cognitive theories are associated with children's development of knowledge and understanding (within specific and general domains). And, some cognitive theory/development has been associated with curriculum knowledge and the design of the National Curriculum in England and Wales (for example, see Shayer & Adey, 2002). The importance of cognitive and socio-cognitive theories in this review is the realisation (by theorists such as Piaget, Vygotsky, Bruner and others) that cognitive enhancement takes place in a social context of teacher-pupil and pupil-pupil interaction; and, dependent on the quality of the relationship between interactors, cognitive development may be enhanced or inhibited (Perret-Clermont, 1980; Montiel, 1992). This relational point has to some extent been recognised in cognitive, talk-based approaches to co-operative and collaborative education as exemplified in the work of Mercer (2000) and Alexander (2004), but has been more fully developed in the classroom-based studies of Blatchford et al., (2005).

D   Studies that explore the role of pupil grouping

An overview of the research evidence on the impact of pupil grouping practices leads us to conclude that no one form of grouping benefits all pupils. Variation in the research evidence can be explained by the different social and cognitive theories that underlie grouping arrangements (Kutnick, 2003) as well as size, composition and learning tasks assigned to pupil groupings (Blatchford, Kutnick, Baines & Galton, 2003). Overall, reviews and meta-analyses of organisational grouping (e.g. Slavin, 1990; Harlen & Malcolm, 1997/1999; Sukhnandan & Lee, 1998; Hallam & Toutounji, 1996) suggest that attempts to narrow the achievement gap through setting or tracking (as it is known in US) appear to have replicated the achievement spectrum that they were designed to reduce. While results from these reviews are consistent, Harlen & Malcolm (1999) remind readers that it is difficult to compare between studies as achievement in classrooms (even in homogeneous, ability-based classrooms) can be affected by level of ability, teacher perception and behaviour, school catchment area (and socio-economic status), diverse curriculum support and choice of variables measured in the study. On the other hand, results from the above reviews appear to be robust and replicated internationally. Even multi-level, multi-group structural equation models of schools, classes and pupils across Europe (in Belgium: Opdenakker & van Damme, 2005; in the Netherlands: van der Werf, Bosker, Lubbers, Guldemond & Kuyper, 2005; in Germany: Baumert, Stanat & Watrman, 2005) have found similar results across the attainment spectrum when focusing on setting/tracking. In contrast within-class grouping may have greater potential to raise standards through personalising the learning experience of pupils – and our understanding of within-class grouping may be applied to classroom processes found in classes that are organised either by differentiated sets or by mixed ability.

One of the few universals that can be stated with applicability to all classrooms is that pupils are grouped for seating and school work. 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 or pairs of children, or individuals working alone. Current 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 (Kutnick et al., 2002; Kutnick, Blatchford & Baines, 2005).

The number and type of pupil groups found in any classroom may be seen to be based on historic procedures and attitudes regarding teaching and learning within any country. In line with traditional classroom pedagogy (of one teacher having responsibility for a whole class), 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 further consider in relation to the pupil's learning (and learning potential), the quality of interactions with peers as well as teachers.

Particularly in large urban areas (where mass education and a large number of school-aged children co-exist), grouping of pupils may also relate to assessed attainment (by particular school subjects), specialised curricular area and friendship/acquaintance. Acknowledging that pupils have so much group-based classroom experience during schooling is one purpose of this review. Questioning how and why pupil groups may promote or inhibit learning is the main purpose of reviewing the literature.

A large range of studies exists in the educational research literature relating to the use of pupil groups in classrooms. These studies do not provide agreement on: what is meant

by pupil grouping, how pupil groups may be composed, who composes pupil groups, what the effects of pupil groups may be within the classroom or the most appropriate measures to assess the effects of pupil groups. Classroom-based studies of pupil grouping can be classified as either naturalistic or experimental (see Kutnick & Rogers, 1994; Blatchford et al., 2003). Underlying this two-way classification is a fundamental divide between: 1) naturalistic observations of the variety of ways that pupils are grouped and (predominantly process-based) effects of these groupings within classrooms, and 2) imposed group working arrangements either informed by theory or policy that are likely to be associated with specific outcome effects. A number of recent studies have bridged the divide (see Gillies, 2003; Webb & Mastergeorge, 2003; Blatchford et al., 2005) by planning and undertaking theoretically informed interventions over time with the expectation that teachers and classrooms 'trained' in the use of particular orientations will 'internalise' group work practices and draw upon the practices as part of their classroom-based/social pedagogy. And, as recommended by Harlen & Malcolm's (1999) review of setting and streaming, many of these recent studies combine a depth of insight into classroom processes with academic outcome. This review addresses these studies.

D.1   Studies in primary schools

Studies undertaken within primary schools generally provide naturalistic observations of classrooms. Within England, consideration of pupil grouping within classrooms may be traced back to early recommendations of the Hadow Commission on social education (1926; 1931; 1933); yet recommendations for the use of pupil grouping has been most strongly linked to the Plowden Report (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 appears as: 1) an afterthought – used to occupy or control the majority of the pupils in a class while the teacher was able to focus attention on a few particular pupils, and 2) a means of differentiating pupils by attainment for focused teaching. While Plowden's recommendations may have appeared radical or 'progressive' in their day, reflections on this recommended practice showed: 1) that very few teachers at that time (and subsequently – over the next two decades) had adopted the suggested teaching style (e.g. Bennett, 1976; DES 1978; Galton et al., 1979; Kutnick, 1988; Galton et al., 1999); and 2) that a dominant characteristic of the frequently found 'traditional' primary school teacher was their grouping of pupils within the classroom by attainment, especially in reading and mathematics (Barker Lunn, 1984).

One characteristic of primary school classrooms did change/develop between the 1950s and the 1990s; this was the physical seating of pupils. Seating has often been associated with types of pupil grouping. 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 traditional seating/desk 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) that between 4 and 6 children could sit around (Galton et al., 1979; Hastings & Chantry, 2000); thus setting a perception the group work may be 'happening' in these traditionally taught classrooms. In fact, studies that have sought to identify a pedagogic relationship between seating and teaching approach in primary schools have not identified a consistent relationship (see Table 2, section B.2) – as most teaching has been teacher-centred and focused on the whole class or individual child (Galton & Patrick, 1990; Galton et al., 1999; Kutnick, et al., 2002).

In England, the Primary National Strategy has produced a range of guidance materials that address pupil grouping issues (listed in Appendix 4). In the main, the materials encourage work in pairs or small groups in the context of lessons focusing on speaking and listening, guided reading, assessment for learning or personalised learning. In *Excellence and Enjoyment: Learning and Teaching in the Primary Years* (DfES, 2004), one of the key principles of teaching and learning listed at the end of chapter 3 suggests that group problem-solving contributes to making learning vivid and real. A case study in chapter 4 on Chase Terrace Primary School in Staffordshire, describes an activity in which pupils are reviewing one another's work in pairs. These examples suggest that paired and group work is receiving greater focus alongside whole class and individual activities.

In the existing naturalistic studies of pupil groupings in primary schools, at least six further themes arise:

- Descriptions of classroom organisation (such as Galton et al., 1979; Galton et al., 1999) identify that teaching and learning processes are undertaken in a variety of 'groupings'.   Children are most likely to be found in whole class, individual seating or small group arrangements. While Galton et al.'s and other studies have shown a variety of groupings, the frequency of use of each type of grouping has changed over the last twenty years, with increases in whole class groupings and small groups contexts for teaching – but with an emphasis remaining on individual work.
- Children (from reception through to Year 6) spend most of their classroom time in seated activities; thus from their seated positions, pupils are likely to spend most of their classroom time in the presence of their peers rather than their teacher (Tizard, Blatchford, Burke, Farquhar & Plewis, 1988; Mortimore, Sammons, Stoll & Ecob, 1988; Bennett, Desforges, Cockburn & Wilkinson, 1984; Galton et al., 1999).
- Consistently presented in studies by Galton and his colleagues (Galton et al., 1979; Galton & Williamson, 1992; Galton, 1990; Galton et al., 1999) and drawing on the first two themes; 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 (see Table 2, section B.2 and Hastings & Chantry, 2000; Kutnick et al., 2002).
- Bennett's (e.g. Bennett et al., 1984) observations extend the understanding of 'learning tasks' that characterise primary school classrooms. Bennett and colleagues, drawing upon Norman's (1978) complex theory of learning, identified that learning tasks found in the classroom included: incremental, restructuring, enrichment, practice and revision (see Appendix 2 for definitions). Classroom learning experience of younger primary school children tends to be dominated by practice and revision (Bennett et al., 1984; Kutnick et al., 2002) although as children progress through secondary schooling they are asked to undertake more incremental, restructuring and enrichment tasks (Baines, Blatchford & Kutnick, 2003).
- A social pedagogy of classroom grouping and learning raises questions about whether a relationship exists between grouping size and assigned learning task (see Table 3 in the next section). Some insight into the grouping and learning task relationship has been provided in studies by Bennett (Bennett & Blundell, 1983) and Hastings (Hastings & Schweiso, 1995). These studies showed that when pupils are assigned a practice-based task, they spend more 'time-on-task' and are more effective in the successful completion of the task when they sit in a traditional, individualised seating arrangement than when they sit in small groups. On the other hand, children are more likely to succeed in

undertaking cognitive tasks when they work in pairs/dyads (Damon & Phelps, 1989; Light & Littleton, 1994; and others).

- Sociological research on children's formation of social grouping (and cliques) within primary school classes (e.g. Nash, 1973; Pollard 1985) suggests that teacher assignment of group seating (usually attainment-based) for classroom tasks (such as reading or mathematics) has been identified as the basis for development of children's friendships – friendships that often represent stereotypical differences between children (by gender, attainment, ethnicity, etc.). A small-scale study (Kutnick & Kington, 2005), of children's performance on science reasoning (cognitive) tasks when they were paired by gender, friendship and attainment, found that girls working with friends at any level of attainment performed at higher levels than boys or girls working with non-friends. The lowest performance was found among boys working with friends. Section D.2.4.1 in this review notes some related findings on friendship following transfer from primary to secondary schools.
- Key Stage 2 pupils' experiences of different types of grouping were explored through interviews (Hallam, Ireson & Davies, 2004) and it was found that they were aware of how and why they were grouped and accepted the reasons given. Pupils were aware of where they were placed compared to other children though this did not affect their attitudes to school. The authors conclude that school ethos has a mediating effect on the impact of grouping on pupils' views of themselves although holding these views did not affect pupil attainment.

D.1.1 Attainment and grouping between and within classes

Studies concerning attainment-based grouping (either by single attainment level or mixed attainment) in primary schools provide equivocal results. Ofsted primary school inspection data from 2003-04 as identified in Table 1 found that few subjects were set by ability, even in Key Stage 2 (although small, about 4% of lessons observed, the proportion of setting in Years 5/6 mathematics has been increasing in the late 1990s; Ofsted, 1998). Mixed ability classes were found in the vast majority of primary schools, but this finding does not necessarily mean that pupils will undertake their class work in mixed ability groups. In England, governments have recommended that teachers organise their classroom groupings in core curriculum subjects by level of attainment (see Alexander, Rose & Woodhead, 1992; DfEE, 1997; and others). Comparisons of academic achievement between children in similar-attainment and mixed-attainment within-class groupings show little difference in attainment scores (Ireson & Hallam, 2001; Suknandan & Lee, 1998)[1]. Because these comparisons are based on averages, this may disguise larger differences found between children at the extremes of the attainment range. Studies such as Ireson & Hallam (2001) note that low attaining children are likely to score at lower attainment levels when they are placed in similar attainment groupings than when they are placed in mixed-attainment groups. Further, children in low attainment groups were less motivated to participate in their classroom experience (also see Suknandan & Lee, 1998). Classroom-based explanations for low attaining children showing lower levels of motivation and achievement when they are grouped with similarly attaining children include: Kutnick et al. (2002) study, where these children were noted to be more likely to be attended to by teaching assistants rather than their teachers; and Webb (1989), where the quality of discussion was severely limited within these groups because of low cognitive level and lack of differences in pupil perspectives. Both studies suggest that low attaining pupils may have benefited, in particular, from working with more experienced teachers and better informed peers. At a school-organisational level, underperformance of low attaining pupils has also been associated with assumptions by some headteachers that streaming or

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[1] When comparisons are made between mixed-ability and ability-based group performance, average scores are usually drawn upon. These average scores do not identify the full range of pupil scores for either mixed or ability-based groups.

setting will benefit all pupils (Lee & Croll, 1995), deployment of teachers, teachers' behaviour towards low attaining children (Ofsted, 1998) and the availability of appropriate materials for use by low attaining pupils (Harlen & Malcolm, 1999).

D.1.2   The relationship between within-class group size and learning tasks
A mapping survey of 187 classrooms (from Years 2 and 5) was undertaken by Kutnick et al., (2002), focusing on particular social psychological issues of group size and composition, learning task, interaction within pupil groups and the role of teachers. A range of group sizes was found in any classroom – often with a number of different sized groupings working simultaneously in the classroom. The various group sizes found in any classroom may be related to pupil effectiveness on particular learning task (as identified by Kutnick's 1994 review and visually displayed in Table 3 below). Research on the four predominant group sizes shows that:

- Organising classrooms so that pupils' work individually is related to practice and revision tasks – promoting increased time on-task (Bennett & Blundell, 1983; Hastings & Schweiso, 1995) as well as creating the circumstances for differentiated tasks (Dean, 2001).
- Dyads or pairing of pupils are used in a number of experimental studies, where cognitive, problem solving (incremental restructuring and enrichment) tasks undertaken in dyads are more successful than when the same tasks are undertaken individually. Dyads can be used in two types of learning: an expert/novice approach and a mutual coming together of equals. Examples of the expert/novice approach are found within peer tutoring (Topping, 1994) and teachers working with an individual pupil (Kutnick, 1994); this approach can be understood by Vygotsky's dynamic 'zone of proximal development' as it involves 'The distance between actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers' (Vygotsky, 1978). The expert/novice approach contrasts with the collaborative/co-operative approach where there is an equality of knowledge and mutuality of interests (Kutnick, 1994; Damon & Phelps, 1989; Cox & Berger, 1985). For the dyad to be effective, though, children have to be able to communicate effectively and also have mutual trust. Examples of working within this approach include: think-pair-share (Lyman, 1981) and argumentation (Johnson & Johnson, 1994).
- Small groups of 4 to 8 pupils are the recommended size for the pursuit of co-operative and collaborative tasks (e.g. Johnson & Johnson, 1987; Slavin, 1990), with these tasks involving enrichment and incremental learning. Actual size of group may vary in what has been referred to as 'small groups', and advice is given in a number of group work approaches about the ideal size for small group work. Suggestions include group sizes as small as 3 (Lloyd & Beard, 1995; Button, 1981; 1982; Curry & Bromfield, 1994) whilst others advise between 4 and 6 (Stanford, 1990; Dunne & Bennett, 1990; Daniels, 1994; Aronson & Patnoe, 1997). A smaller group may increase participation by group members (Stanford, 1990) or be more suitable for those with less developed group work skills (Johnson & Johnson, 1987) including younger pupils (Daniels, 1994). It has been observed that a larger group may increase the diversity of skills or opinions within the group, as well as the opportunity to work with a range of other people (Stanford, 1990; Aronson & Patnoe, 1997). It has also been noted that larger groups may reduce involvement and motivation of individuals (Stanford, 1990; Aronson and Patnoe, 1997), break up into smaller units (Dunne & Bennett, 1990) or need more structuring by the teacher (Button, 1981; 1982).
- Whole class teaching has been a traditional means of transmitting and reinforcing knowledge to a large number of children simultaneously (Merrett, 1994). This

cannot guarantee whether the children will actively participate in the learning task being undertaken due to the teacher's inability to interact with all children in the class simultaneously, especially seen in teacher-led question and answer sessions. Reid, Forrestal & Cook (1989) offer a more dogmatic view and suggest that whole class work should be avoided if at all possible. They suggest that whole class work mediates against the principle aim of pupil participation – talk and active learning. Where whole class work is used, they advise on particular strategies, which the teacher may use to minimise a didactic approach and enhance the pupils' role to be as active as possible. Their suggestions include the use of open-ended questions; allowing time for pupil responses, and preliminary paired and small group work to allow for thinking before whole class discussion.

Considering and comparing findings from studies has led Kutnick (1994) to identify possible relationships between within-class group size and learning tasks as suggested in Table 3. In this table, ideal group sizes are identified in relation to types of learning task (as described by Norman, 1978 in Appendix 2). In addition to relating group size to learning task, effective learning will be supported if the relationships are planned. When larger or smaller pupil groupings are used, the effectiveness of the learning task may be inhibited. This may also occur if pupils talk to one another during practice and revision tasks (Hastings & Schweiso, 1995) or children do not have good communicative skills for incremental tasks (Light & Littleton, 1994 in relation to cognitive tasks; and Webb & Mastergeorge, 2003 in relation to cooperative/enrichment tasks).

Each of the group sizes (with related tasks) defined in Table 3 may only be part of an overall lesson plan/process. Over the course of a lesson (or a group of integrated lessons) teachers may draw upon the various group sizes in a cyclic fashion (Edwards, 1994). The cycle may begin with the whole class reviewing information from a previous lesson. The review may be followed by a brainstorming session where pairs of pupils generate new ways to approach cognitive problems associated with the lesson. Co-operative small groups may enrich and apply new information to the problem. Individual pupils may undertake practice-based applications related to the problem. Often, at the end of a lesson, the whole class will re-convene for a debriefing and review of the lesson material. The cyclical nature of a lesson or group of lessons may seem a logical description of classroom activity, but (as discussed in sections D.1.3 through D.1.5) many teachers do not provide clear relationships between learning task and group size in their classrooms (Kutnick et al., 2002).

These suggestions of how group size relates to learning tasks should be complemented by further findings on how particular learning tasks may encourage or discourage learning. Learning tasks must be set at an appropriate level to encourage group working. Tasks set at too low or too high of a cognitive level will discourage pupil participation (Bossert, Barnett & Filby, 1985). And, breaking down a task into components such as planning, brain storming and forming consensus will facilitate group working (Tolmie, Howe, Duchak & Rattray, 1998; Webb, 1989); if the task is not broken down into such components, pupils may lose interest and direction.

Table 3: Relationships of group size to learning task

Group size	*Learning task*	*Knowledge relationship*	*Social relationship*	*Working interactions*
Individual	Practice, revision	Unequal (teacher: pupil)	Hierarchical	Individualised, individuated
Dyad	Incremental, restructuring	Equal (pupil: pupil)	Mutual	Collaborative/ co-operative work brainstorming, joint problem solving
	Incremental	Unequal (tutor: pupil)	Mutual	Peer tutoring
Triad	Incremental, restructuring with computer or other apparatus	Equal (pupil: pupil) With additional pupil working apparatus	Mutual	Collaborative work, brainstorming, joint problem solving
Small Group	Enrichment, restructuring	Unequal (pupil: pupil)	Mutual	Co-operative group work
		Equal (pupil: pupil)	Mutual	Collaborative work
Large group	Incremental	Unequal (teacher: pupil)	Hierarchical	Lecturing, teacher led discussion
Whole class	Incremental	Unequal (teacher: pupil)	Hierarchical	Interactive lecturing,
	Practice, revision	Unequal (teacher: pupil)	Hierarchical	Individualised, individuated

D.1.3 The relationship between group size and class size

While the review has drawn attention to relationships between within-class group size and learning task (leading to recommendations concerning flexible use of grouping for learning task), other studies have linked group size to age of pupils and general class size. The size of class and group contribute to classroom environmental context, with the group level nested within the level of the whole class. It might be expected, for example, that in a large class the teacher would be forced to organise the children into smaller groups, but this is not clearly supported by the research evidence.

In combining results from extensive classroom observations in the Class Size and Pupil-Adult Ratio (CSPAR) study (Blatchford & Martin, 1998) and the Primary Classroom Grouping Practices Project (Kutnick et al., 2002), the predominant group size in primary classrooms was 4-6 children; followed in frequency by larger groups of 7-10 and 11+ (which were mainly whole classes). The qualitative analyses indicated that smaller groups of 4-6 are favoured by teachers, because of the way they can help teaching input, child concentration and contribution. While these small groups of 4 or 6 children may be favoured by teachers, there was little evidence that these groups were either assigned co-operative/collaborative tasks or encouraged to interact collaboratively (Blatchford, Baines, Kutnick & Martin, 2001; Blatchford 2003). Results showed that in larger classes,

especially with the youngest Reception aged children, teachers appear 'forced' to teach in larger groups of 7 -10. Qualitative analyses indicated that larger groups were a less effective educational environment: it was difficult to give children the attention they might want and need from the teacher; the quality of children's work was lower; and their contribution and concentration in groups suffered. One consequence of larger classes is, therefore, the likelihood of larger, less educationally effective groups.

Lou et al. (1996) also found, on the basis of their meta-analysis of within-class grouping studies, that smaller group sizes were optimal for students' learning; larger groups of 6 to 10 members were less effective. It may be important to reiterate that the youngest children had few/larger groups in their classes - especially in Reception and Year 2. Explanations for these large groupings may relate to availability of adult support (younger pupils being perceived to be more reliant on adults for the maintenance of concentration); and a greater focus on learning tasks involving practice and revision (Kutnick et al., 2002). It might be argued that one solution to the teacher's difficulties with large classes would be to alter her approach so that there is more teaching to larger groups or the whole class. This may be possible in some curricular areas and for some activities, but whole class teaching will not always be relevant to primary aged children, especially the youngest children. Whole class teaching can be used in a productive way, but whole class teaching forced on teachers as a compromise in the face of larger class sizes is a different matter (Blatchford & Martin, 1998).

One result that emerged when looking at the connections between class size and type of interaction within groups was the finding that there was less cooperative group work in the smallest classes. This ran contrary to the expectation that there would be more evidence of group work in smaller classes, more pupil involvement in learning activities and greater potential for classroom learning. It seems that although smaller classes may have benefits in terms of allowing smaller groups and greater pupil involvement, teachers almost exclusively use focused and individualised teaching with smaller class sizes. CSPAR provides some evidence of improved pupil concentration, but relatively little gain in attainment. Additionally, there were few benefits in developing ways in which children can work together more productively.

Conceptualisation of class size effects has not to date been very sophisticated. The results presented here indicate a linkage between class size and groupings in the class. So while debate about size of class has often been in terms of reduced size of class resulting in pupil academic gains, it is also important, educationally, to consider grouping size and to ask about the optimum group size and its effects. This was nicely expressed by a teacher who said that her daily routine was not affected by the number of children in the class but by the size of groups she worked with at any one time.

D.1.4   Group working skills and composition
Group composition and communication skills are fundamental for the effective working of pupils in any grouping (no matter what size the group may be). From Galton's (1990) descriptive analysis of classrooms we note that not all pupils will like working in groups; and a number of 'threats' to group working have been identified – including status and dominance of group members and over-reliance on the presence of the teacher. There is some parallel between Galton's findings and research by Cowie & Rudduck (1988) who noted that some children like group working, some do not like group working and some are 'not bothered'. Galton & Williamson's (1992) discussions with teachers concerning classroom conditions that help to promote collaborative group working found teachers assuming that the nature of the task is the key element of successful collaboration. Focus on the task is a very different approach from specific training programmes developed by Joyce & Showers (1983), the Social Pedagogic Research into Grouping (SPRinG) project (Blatchford et al., 2003) and others.

For effective group working of any kind, children must establish positive relationships between group members (e.g. Light & Littleton, 1994; Mercer, 2000) that allow for sensitivity to others, trust of others and effective communication (Kutnick & Manson, 1998). Development of group working conditions that allow sensitivity, trust and communication often require training for these skills (Mercer, 2000; Webb & Mastergeorge, 2003; also see section E.1 below on training), and children without these skills are less likely to interact (with peers and teachers) and achieve at high levels in their classrooms (Kutnick, Layne & Jules, in preparation). Primary school teachers rarely include training for group working and communication in their classroom practice; Kutnick et al.'s (2002) mapping survey of approximately 200 Year 2 and 5 teachers from 111 schools found that only 26% of the teachers provided any training or specific support for group working skills in their classes. Lack of training for effective group work provides a strong explanation for the inconsistent or negative attainment findings in the range of classroom grouping studies often described in the literature. Reasons behind the lack of training include limited educational experience of the teachers (identified in Kutnick et al., 2002), teachers' feelings that they may lose classroom control with corresponding levels of classroom disruption (Cohen & Intilli, 1981), teachers' beliefs that children are unable to learn from one another (Lewis & Cowie, 1993), beliefs that group work is time consuming with brighter children helping others and not advancing themselves (Plummer & Dudley, 1993), and teachers' general feeling of ambiguity of purpose for group work (Doyle, 1986).

Composition of these (largely ineffective) pupil groups has been dominated by gender, attainment and, to a lesser extent in primary schools, friendship. Some studies have shown that single-sex groupings have been more effective at task completion than mixed-sex (for example, Tann, 1981); although a balance of males and females in small groups has been found to promote effective (and inclusive) communication (Webb, 1991) and single-sex pairs working on cognitive tasks have favoured female-only groups over male-only (Faulkner & Meill, 1994; Meill & MacDonald, 2000; Kutnick & Kington, 2005). It should be noted that research covering friendship/gender and cognitive tasks has not accounted for ethnic differences, although ethnicity may have similarly diverse effects as those reported concerning friendship; but more focused studies will need to be planned and undertaken.

Friendship has also been recommended as a basis to compose pupil groups, but equivocal results have been found regarding the use of friendship grouping in classrooms. While researchers such as Hartup and colleagues (Hartup, 1993; Azmitia & Montgomery, 1993; Hartup, 1998) recommend the use of friendship as the basis for group composition (as friends have already created a common understanding within their friendship groups and are likely to be sensitive and supportive to one another), there is only inconsistent support in the literature. Studies such as MacDonald, Meill & Mitchell (2002) find that friendship pairs are more effective in creative compositions than acquaintance pairs. But in a friendship by gender interaction, girl-girl/friendship pairs have been found to be more effective in cognitive problem-solving than girl-girl/acquaintance pairs, but that girl-girl and boy-boy/acquaintance pairs have been more effective than boy-boy/friendship pairs (Littleton, Meill & Faulkner, 2004; Kutnick & Kington, 2005).

D.1.5 Group size, interaction and learning outcomes
In all pupil group sizes, at least two forms of interaction must be considered with regard to learning processes and learning outcomes. Learning processes related to cognitive development (either new knowledge or application of knowledge) will be enhanced by effective social communication and support (Light & Littleton, 1994; Mercer 2000; and others). In contrast, these cognitive-oriented processes will be inhibited if the pupils appear threatening to one another and pupils maintain an over-reliance on the presence and direction of the teacher (Galton, 1990). Size of pupil group related to type of learning

task can also promote or inhibit interactions associated with learning (as identified in Table 3 above), and these learning interactions may be supported or inhibited via teacher-driven assessment processes.

With regard to group size and interaction among children, Damon & Phelps (1989) suggest that dyads allow a mutual interchange of (intellectual) perspectives between children while the addition of a third person (in a triad) is likely to introduce an element of 'power' where discussion/interaction may be limited by any two children adopting the same perspective. Individuals will not be in a position to share perspectives – hence their cognitive activity will be limited. On the other hand, pupils assigned a practice task may achieve better outcomes by working alone. Research by Bennett & Blundell (1983) and Hastings & Schweiso (1995) has already been cited to show that individual seating for individual tasks allows more time on-task. Additionally, Jackson & Kutnick (1996) videotaped and compared children working in pairs or individually on a practice task, and found that children working individually outperformed pairs on a mathematics task and that pairs often created conditions of competition or challenge that drew the partnership away from the task.

Observational studies of interaction in primary classrooms (for example, Bennett et al., 1984; Galton et al., 1999) find that pupils may be assigned tasks in which: individuals are asked to work only as individuals; individuals are asked to work individually, but in the presence of other pupils (as identified in Table 2); small groups are asked to work as individuals or as groups; and that the presence of a teacher may promote or inhibit interaction within a group – depending on type of intervention. It should be noted that the results cited for the studies above were recorded in classrooms that were unlikely to have been trained in group working skills (see previous section); hence, findings may be different if an effective training programme was put in place (Blatchford et al., 2003).

The mapping survey (Kutnick et al., 2002) has been one of the first studies to focus solely on the nature and use of within-class pupil groupings in primary school classrooms as well as issues such as group size and learning task identified in Table 3. The study undertook classroom 'mapping' in 187 classrooms of Year 2 and 4 children. Classrooms were mainly mixed ability. The study confirmed that in any particular classroom there is likely to be a range of group sizes and compositions. Classroom group size was dominated by small groups (49% of pupil experience), followed by whole class (21%), large group of 7 to 10 pupils (11%) and dyads (10%). Triads still accounted for 7% of pupil groups and only 2% of grouping could be labelled as individual. Most groupings were composed of children at the same level of attainment, and this composition accentuated gender differences. Low attaining boys were likely to be found working as individuals or small groups (also seen in Pollard, Triggs, Broadfoot, McNess & Osborn, 2000), which may disadvantage them as they have little or no opportunity to compare different perspectives (Webb, 1989). High attaining girls were likely to work in small groups, and received significant proportions of teacher attention. Teachers rarely placed children in friendship groups.

When children were working on classroom (learning) tasks, there was little evidence of a relationship between group size and learning task, and the classic mismatch of seating children in small groups but assigning individual/practice tasks was much in evidence. Similarly, there was little evidence that expected types of interaction (individual work, collaborative and co-operative work, etc) related to actual group size. Adults in the classroom, especially teachers, tended to work with large groups and individuals: in large groups (especially whole class) teachers dominated the introduction of new (cognitive) knowledge; in small groups (4 to 6 pupils), teacher's presence was less frequent but even when the teacher was present the children were most likely to be assigned practice tasks. Teachers were least likely to be found with dyads, which were evident infrequently and

were likely to be undertaking cognitive tasks. Teaching assistants were most likely to be found working with boys that were low attaining and assigned individualised tasks.

Thus, as a first attempt to systematically identify the range and use of pupil groupings in authentic primary school classrooms, this study was not able to find consistent social pedagogic relationships between group size, composition, learning tasks and interactions to support learning. Teachers, while responding to national policy recommendations to use a range of group sizes in their classrooms, were likely to: use levels of attainment as the main rationale for composition; associate themselves with the introduction of new (cognitive) knowledge in the classroom; and to support higher attaining pupils. While classroom seating was most likely to be in small groups (around tables), children were provided with little opportunity to work collaboratively and received very little training in the communication and support skills that would facilitate effective group work.

The mapping study raises a number of concerns regarding within-class group size, learning tasks and teacher role. Other studies confirm and extend the concerns identified. Galton, et al. (1999) noted that the teacher's role could fundamentally shape patterns of pupil interaction and participation. Given that a large amount of time in primary school classes will be spent in whole-class and large-group teaching, one may question whether teacher actions are likely to encourage children's involvement in their learning. Kutnick et al. (2002) identified that teachers are more likely to be found interacting with higher attaining girls in the class, a finding similar to primary school studies in didactic Caribbean classrooms (Kutnick, Jules & Layne, 1997). Teacher/pupil interaction studies in the UK have a strong correlation with didactic critiques. Howe's (1997) review of studies notes that classroom interaction usually refers to interactions between teacher and pupil; whereas most pupil interactions are with other pupils. Most interaction is 'talk' based and the teacher has been described as controlling most of the talk by lecturing or asking questions; thereby controlling knowledge and behaviour in the classroom (Young, 1971; Younger, Warrington & Williams, 1999).

One explanation for the control of knowledge in classrooms is the actualisation of Vygotsky's (1978) 'Zone of Proximal Development' or knowledge-based 'scaffolding' (Wood, 1998). But, as Howe (1997) indicates, where this scaffolding is in operation, the teacher can only interact with one child (or a very small number of children) at a time and the likelihood of preferred interactions may take place. Preferred interaction is related to ability level (Morgan & Dunn, 1988), gender or other characteristics (Jones & Greig, 1994; Myhill, 2002). These studies appear to assume that the teacher-pupil dyad is the main focus for classroom learning and that all pupils' learning potential is encouraged in this context; little consideration is given to ways that the teacher can involve all children in whole-class teaching and ways that within-class groupings of peers can spend the majority of their classroom time more effectively (for learning).

D.2   Studies of pupil grouping in secondary schools
Descriptions of pupil groups in classrooms in secondary schools partially replicate the findings and concerns characteristic of primary schools as well as introduce a stronger element of 'experimental' group working. Secondary schools have been the site where collaborative and co-operative interventions have most frequently taken place – although these interventions are rarely found in everyday classrooms. In the past, these intervention studies tended to focus on classroom and school outcomes associated with a particular type of intervention. Co-operative and collaborative interventions often compare highly structured methods of problem/task selection, group assignment, materials preparation and form of output. The interventions compare co-operative and collaborative approaches to 'traditional' teaching methods covering the same topic area, and results from these studies have been thoroughly documented over the years (see Pepitone, 1980; Johnson & Johnson, 1987; Slavin, 1990; Gillies & Ashman, 2003). Interventions reported

and compared have tended to take place over time (usually a minimum of one school term rather than a one-off lesson) and the studies are usually theory-driven. As Gillies & Ashman (2003) identify, the theories may relate to socialisation, learning or a combination of both. From these theoretical bases, researchers and interventionists have: 1) promoted particular orientations to tasks undertaken in group working and the composition of pupil groups asked to undertake the tasks; and 2) identified theory-related outcomes. To undertake these interventions requires much planning and gathering of resources for the teacher and willingness to participate by pupils. Studies that compare intervention classes to non-intervention classes undertaking the same topic only find limited academic improvement.

Tasks may be structured to require peer tutoring (as jigsawing by Aronson, Bridgeman & Gellner, 1978), teams-games-tournaments (DeVries & Edwards, 1973), student-team-learning (Slavin, 1977) and interdependence of group members (as in group investigations, Sharan & Sharan, 1992). Hence, success on these tasks is dependent on the quality of the contact arranged between group members. Positive interdependence of group members characterised by 'contact theory' (from Allport, 1954) and use of productive grouping (Cohen, 1994) is related (in reviews of the literature - see Ashman & Gillies, 2003) to learning and academic development[2]. A mixed group composition is recommended in a number of co-operation studies (especially Slavin, 1990) which encourages the construction of 'heterogeneous' cross-sections of pupil traits within any classroom; asking boys and girls, and children of high and low attainment and diverse racial group and ethnic background to work together. Drawing upon these pupil cross sections, positive socialisation outcomes are encouraged – including cross-sex, attainment and racial friendships as well as fostering of pro-school attitudes.   A number of meta-analyses of co-operative and collaborative (comparative) studies have been undertaken (Kulik & Kulik, 1992; Lou et al., 1996; Slavin, 1987 and 1983). Results from these analyses consistently show only limited academic gains in co-operative/collaborative classes compared to traditional classes, but pro-social and pro-school attitudes improve significantly in co-operative/collaborative classrooms.

D.2.1   Group processes that facilitate learning

An alternative set of studies explores group processes that facilitate interventions (see Webb & Mastergeorge, 2003; Webb & Farivar, 1994; and others). Webb, as a particular example of process-based intervention research, has identified 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). Particularly with regard to effective communication, 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), and are applying this approach to a number of Key Stage 3 classrooms in England (Mercer, personal communication). Similarly, Alexander (2004) has developed a programme of 'dialogic teaching' that relies on communicative and interpersonal support between teachers and pupils (see section E.1 for more detail).   Referring back to the range of studies undertaken by Webb and colleagues (also see Webb 1989; Webb, Baxter & Thompson, 1997), planning for effective discussion and cognitive learning also considers group composition (drawing upon a 'banded' range of attainment within any pupil group), the role of task (cognitive problem

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[2] While comparisons between co-operative/collaborative studies and existing practice have consistently found (slightly) enhanced academic performance and significantly improved school attitudes in the experimental classes: 1) these results are not found in all cases and 2) studies are not very clear in their definition of 'control'/normal practice.

solving set at a level in accordance with Bossert et al., 1985) and various types of within-class training to support group working.

As part of a wide-ranging approach to transforming teaching and learning at Key Stage 3 in England, the DfES Key Stage 3 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. These materials are based on the work of Mercer and colleagues, as well as referencing other recent research. 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 (see Appendix 4 for a more detailed description of the materials), and should prove practical and useful for classroom teachers (although this can only be ascertained by follow-up research). Materials for the strategy were compiled from a variety of individual studies and may be complemented by the more holistic research approach is described in D.2.2.1 and impacts of training group for pupil attainment and motivation described in E.1.

Research on training to engage in group work is considered in depth in section D.1 of this review, but some highlights may be identified here. The SPRinG project (supported by ESRC/TLRP and undertaken by Blatchford, Galton & Kutnick, 2000) approach to training pupils and teachers in the promotion of effective group work was informed by studies that were undertaken in the Caribbean and England. In the Caribbean (Kutnick et al., in preparation) the focus was on established studies of underachievement in Trinidad and Barbados (see Kutnick et al., 1997). Underachieving pupils were identified by low scores in their classroom assessments and lack of participation in their classrooms. Working with pupils of the KS3 age group undertaking social studies, whole classes were involved in a two-term action research training for effective group working. Results showed increased participation for all pupils, especially those identified initially as low achievers. In addition, low achievers significantly improved in their within class assessments and teachers changed their perceptions of their classes to acknowledge good social relationships as a key basis for good classroom performance. In England, Galton and colleagues introduced the SPRinG approach to KS3 teachers and pupils in English, mathematics and science classes (early results from this project are described in section E.2).

At least three characteristics underlie these collaborative and co-operative intervention studies: 1) tasks must be selected that involve particular types of group intellectual interaction, 2) the composition of pupil groupings should promote social interaction, and 3) teachers played a major role in the encouragement and training of pupil group work skills in these studies.

D.2.2 Naturalistic studies in secondary schools

Naturalistic studies of pupil groups in secondary school classrooms (especially in the UK) are located in two traditions: sociological and pedagogical. In line with the developing methodological approach of school and classroom ethnography from the late 1960s (especially see Hargreaves, 1967; Lacey 1970), classroom social experience has been described as a site for social reproduction (Bowles & Gintis, 1976) within which attitudes and behaviours are constructed in response to structural demands of schooling (Bourdieu & Passeron, 1977). Studies of pupil interaction and within-class grouping from this tradition have described processes of differentiation and polarisation by social class, attainment, race and gender. From Ball's (1981) ethnography of a comprehensive school, insights were drawn concerning differentiation by attainment and social class (with lower levels of academic achievement by children of working class parents and corresponding effects on school attitudes). More recently Reay (1998), Suknandan & Lee (1998) and Ball (2003a, 2003b) have argued that research suggests there is no conclusive evidence that ability grouping raises attainment across schools and such practices have a negative effect

for students in 'bottom groups'. However, they note that parents (mainly from the middle classes), who have traditionally deployed a high degree of influence over decisions in the management of schools, maintain the advantaged position of their children, through supporting practices such as ability grouping. In this way, ability grouping contributes to the continued reproduction of inequalities in education derived from social class.

Further patterns of interaction among disaffected peers and between these pupils and their teachers that promote anti-school attitudes have been described in Marsh, Rosser & Harre's (1978) study of football hooligans and Willis' (1977) study of disaffected boys in and out of their secondary schools. While dated, these studies should not be seen to state simplistically that schooling will create disaffection among some groups of pupils – as Fuller (1984) described in her account of a group of black girls in a comprehensive school. These ethnographic studies show that structural/organisational processes within schools are often related to the process of differentiation and separation of pupils from one another. These 'separations' are related to curriculum subject (Goodson & Managan, 1995), age of pupils, level of academic attainment (discussed below); but there are very few studies that focus on ethnicity. From an alternate perspective, the Ofsted study (2003) concerning boys' achievement noted structural/organisational processes could help to improve achievement. Processes included positive school ethos, formative feedback, setting of clear lesson objectives/limits, and use of within-class seating and grouping activities to encourage greater participation/involvement in learning.

D.2.2.1   Composition of within-class groups in secondary schools

In an interview-based study of secondary school teachers' understanding and attitudes towards pupil grouping, Kutnick, Blatchford, Clark, McIntyre & Baines (2005) worked with teachers across core curriculum subjects in Years 8 and 10 to understand why and how they formed pupil groupings within their classrooms. Results from the interviews showed, at a general level, pupil groupings were structured in relation to lesson phase and use of (curriculum-oriented) equipment. Lesson phase followed a sequence of whole class opening, small group or individual task and whole class lesson close. Grouping by equipment, found especially in science, involved assessing the amount of equipment available for a lesson and constructing the number of groups (and group size) accordingly. In some English lessons, where discussion of reading material was required, a few teachers stated that they structured their groups for conversational interaction (although they did not refer to sizes or training most likely to facilitate pupil-pupil communication). Overall, reasons underlying pupil grouping were dominated by classroom organisation rather than pedagogic purpose.

In a further application of the classroom mapping technique (described in Kutnick et al., 2002), Kutnick, Blatchford & Baines (2005) surveyed 250 Year 7 and 10 classes from 47 secondary schools. Results showed that pupil groupings in these classrooms were not constructed by teachers, rather pupils were 'allowed' to choose their own seating and the most consistent explanation for this seating (and grouping) was friendship. In this secondary school study, while pupils sat in different sized groupings when undertaking classroom learning tasks, they tended to work in friendship pairings that were strongly correlated to classroom attainment level and gender (ethnicity was not a variable in this study). Unlike the primary school study (Kutnick et al., 2002), these pupils were more likely to be asked to engage in some form of interaction and their classroom tasks were more likely to involve application of existing knowledge than practice tasks. Similar to findings from primary schools, these (work-based) pairings did not correspond to type of pedagogic/learning task or any type of planned interaction among group members.

Teachers provided little training for social or communication interaction, yet (as discussed by Baines et al., 2003), pupils had to develop classroom strategies for learning, especially where the teacher was unlikely to be present. When classroom dyads were the

predominant 'working' group, a large majority of pupils worked autonomously from their teacher who was engaged with other learners. In having more time to interact with one another, secondary school pupils were found to spend more of their time in stereotypical conditions. Their friendship-based working groups were dominated by same sex and similar attainment, which were identified by Boaler et al. (2000) as the basis for classroom polarisation, underachievement by low attainers and development of anti-school attitudes.

Aside from the limited number of studies cited above, there are very few further studies that have explored within-class grouping, especially in relation to attainment. Harlen & Malcolm's (1999) review noted that: a) there was no advantage for within-class setting for mixed-ability classes although mixed-ability classes were more difficult to manage and teachers had difficulties in providing curriculum material suitable for the full ability range (in class); and b) there were distinct disadvantages for whole class setting associated with social class divisions, and low teacher expectations and deviance in low attainment classes.

D.2.3   Organisational grouping in secondary schools

D.2.3.1 The impact of the composition of groups
Allocating pupils to organisational groups such as sets is most likely to be informed by internal school tests or Key Stage tests with fewer schools using CAT scores or information from feeder primary schools (Ireson, Clark & Hallam, 2002). Greater use was made of this information in mathematics and science than in English, whereas in the latter, gender and motivation were more likely to influence decisions. Most pupils are not aware of the basis for setting and many assume behaviour to be a key criterion (Hamer, 2001). Lower sets have a disproportionate number of boys, pupils from specific ethnic groups and pupils from lower social economic groups; being placed in lower sets affects expectations and aspirations (Boaler, 1997a; Boaler, Wiliam & Brown, 2000; Wiliam & Bartholomew, 2004). Lower sets are typically half the size of top sets but the size of the year group and specific subject restrictions in areas such as science and technology also influence size of sets (Ireson et al., 2002). Movement between groups happened in both mixed ability and sets but occurred less often between mixed ability groups than between sets and were mainly attributed to clashes of relationships between pupils or between pupils and teachers. Movement became less likely as pupils progressed through KS3. All of these factors suggest the need for flexibility in whichever approach to organisational grouping is adopted and to monitor the effects and act upon the feedback.

D.2.3.2 Impact on attainment and progress
Slavin (1988) reported no consistent effects of ability grouping on attainment from two research syntheses of studies relating to elementary and secondary schools. His review suggested that in some studies high achievers gained from ability grouping at the expense of low achievers but overall, the effects clustered around zero for students at all levels. These findings were later confirmed by Sukhnandan & Lee (1998) in their review of the literature, which compared the effects of setting and mixed ability teaching on overall attainment outcomes and noted no significant differences. Gamoran (1992) concludes that the more rigid the setting system, studies were likely to demonstrate no benefits to overall school achievement and detrimental effects in terms of equity.

One reason why this lack of an achievement effect was found, Slavin (1988) suggests, relates to the limited impact that ability grouping has on the heterogeneity of a class. He reviewed studies demonstrating the relatively small reduction in variability achieved through ability grouping and noted that grouping students on any one criterion leaves considerable heterogeneity on any other specific skill domains. For this reason, Slavin argues for between class regrouping plans in specific domains such as reading or areas of mathematics (for example, the Joplin Plan in elementary schools - Floyd 1954). These

plans involve the pupils remaining in heterogeneous classes for most of the day but regrouping for specific activities and, Slavin argues, the limited research suggests regrouping can be effective, provided that the pace and level of instruction are adapted to the student performance levels.

Ireson et al. (2002) undertook a large scale study using a stratified sample of 45 mixed comprehensive schools representing a range of grouping practices. In mathematics, pupils attaining higher levels in the Key Stage 2 tests made more progress in sets in Key Stage 3, whereas pupils attaining at lower levels at Key Stage 2, made greater progress in mixed ability classes. In English, there was much less rigorous setting and no relationship was found between the set and progress in Key Stage 3. Similarly, no effects were found in science. However, for some pupils in mathematics, the set to which they are allocated affected their Key Stage 3 results irrespective of their prior attainment; higher placed pupils attaining higher scores in Key Stage 3 results than those of similar prior attainment placed in lower sets (Ireson et al., 2002). When the same pupils were followed up at GCSE (Ireson et al, 2005) it was noted that there were no significant effects of setting in English, mathematics or science and effects on higher or lower attaining pupils were inconsistent across subjects. However, in all three subjects, pupils of similar prior attainment achieved higher grades when they were placed in higher sets.

For pupils with similar prior attainment in mathematics at KS3, on average there is a 1-3 grade difference between pupils in lowest and highest sets at GCSE (Wiliam & Bartholomew, 2004). Comparing matched pupils in mixed ability groups and sets suggests that being placed in a top set raises the GCSE grade in that subject by half a grade and being in the bottom set lowers it by half a grade (Wiliam & Bartholomew, 2004). As mathematics is the subject most likely to use setting (Table 1), it may be difficult to generalise these findings to other curriculum subjects. On the other hand, there are few reliable studies of other subjects other than Ireson et al. (2002), that explore the attainment effects of being placed in high, low or mixed ability classes.

Within-class grouping seems to partly counteract the differences in attainment related to organisational grouping. The differences between sets in mathematics in value-added scores were not significant in schools that used small, within-group teaching (Wiliam & Bartholomew, 2004). However, value added in Key Stage 3 for the lowest attaining pupils is greatest in mixed ability groups that use flexible within-class groupings suggesting that for these pupils, the benefits of mixed-ability organisational grouping are further enhanced by within-class grouping. Within-class ability grouping has been found in some studies to have a positive effect on levels of attainment for pupils of all abilities, the more linear (using deductive understanding) the subject, the greater the effect (Sukhnandan & Lee, 1998).

D.2.3.3 Impact on teacher and pupil attitudes

The relationship between ability grouping of pupils (e.g. streaming, banding, tracking, setting, etc) and disaffection, in particular, of pupils in the lowest groups, has been well demonstrated. Studies by Boaler and colleagues (Boaler, 1997a; Boaler et al., 2000) compared set versus mixed ability mathematics classes in secondary schools and noted under-achievement, polarisation and anti-school attitudes in lower set classrooms. Results similar to Boaler and colleagues were found in a large-scale survey across subjects in secondary schools by Ireson & Hallam (2001) and the report by Suknandan & Lee (1998).

Both pupils (Foskett, Dyke & Maringe, 2003; Hamer, 2001) and teachers (Hallam & Toutounji, 1996) reported preferences for being placed in particular set classes within their (organisationally set) schools, although the variation in pupils' attitudes between different studies was marked. In Foskett et al.'s (2004) study of the influences on post 16

participation, many pupils saw ability grouping as a good thing as long as they were in the higher groups, as this ensured work at a pace of those with similar ability. Pupils saw the lower sets as being given less attention, associated with lower teacher expectations and restricted by curriculum and assessment contingencies. In general, setting was seen by teachers and pupils as allowing pupils to learn at the pace of the group, although there was recognition that lower sets may damage self-esteem and lower aspirations (Hamer, 2001). About one third of those placed in top mathematics sets, mainly girls, wanted to be moved down a set as they perceived that the teaching pace and style limit their requests for alternative explanations (Boaler, 1997b).

D.2.3.4 Impact on teaching and assessment
Use of ability-based organisational grouping has been associated with differences in curricular material, teaching activities and assessment (Boaler, 1997a). Evidence suggests that if not planned, teacher attention may be disproportionately focused on higher attaining pupils in mixed ability groups (e.g. Younger et al., 1999). Higher sets were more likely to have experienced and highly qualified teachers (Sukhnandan & Lee, 1998) and lower sets, more changes of teacher and teachers who were not specialists in that subject (Boaler et al., 2000). It has been found elsewhere (e.g. Black and Wiliam, 1998) that high quality teaching was relatively more beneficial for lower-attaining pupils, especially underachieving boys (Ofsted, 2003).

Boaler et al. (2000) surveyed 943 students in 6 secondary schools in mathematics over years 8-9, with students in four of the schools moving from mixed ability to set groups. Pupils in some mathematics sets were taught as if they were identical in ability, given the same tasks at the same pace, which was not observed in most mixed-ability groups – even when these were taught by the same teachers. Pupils in lower mathematics sets reported, and were observed to be, insufficiently challenged and expected to spend more time copying off the board than in higher sets. A third of the pupils in the lower sets in Boaler et al.'s study reported that they would spend less than two minutes on a maths question before giving up – the lowest category of time on the questionnaire – whereas only 7% of pupils from top sets chose this option. Nearly a third of the students in the lower sets reported that the work was too easy compared to 7% in the upper sets.

Gamoran (1992) reviewed evidence suggesting that higher-track teachers were more enthusiastic and took more time preparing lessons. Teachers in low-track classes, he concluded, spent less time on instruction and more on behaviour management. If the pupils were placed in groups on the basis of school-based achievement (especially at the secondary school level), the extremes of high and low attaining children may be offered different versions of the same curricular material. Lower attaining pupils may be offered more concrete and less challenging material (Gamoran, 1992; in mathematics, Boaler et al., 2000) that may not encourage extended thinking skills or provide the basis for elaboration in group working.

Entry to different examination tiers according to ability group limits the range of possible grade outcomes and actual assignment of grades (Kutnick et al., 1997). Access to tests and examinations (especially at Key Stage 4) in many subjects will also be differentiated by teacher assessment and hence, the range of grading and assessment feedback will be different for each set in an ability-based pupil grouping system. Restricting access to higher tier assessments in lower sets in Key Stages 3 and 4 led to disaffection (Boaler, 1997a) and was regarded by pupils and teachers to have major implications for later life chances (Foskett et al., 2004). In the study of influences on post 16 participation, Foskett et al. (2004) noted that pupils perceived placement in a lower set as ruling out post 16 pathways and options linked to that particular subject. Organisational-based grouping practices can thus be seen to mediate both the summative and formative assessment that

can be provided in schools for pupils – affecting teacher and pupil behaviour, pupil self-efficacy and the range of educational opportunities offered in the classroom.

D.2.3.5 Impact on pupils with specific characteristics
The evidence of the impact of grouping strategies on pupils with particular characteristics such as gender, ethnicity, those identified as having special educational needs or as being gifted and talented is provided in two areas - group composition and individual. Earlier in the review, for example in paragraph D.2.2.1, research on the impact of group composition was reviewed. It is clear that there is more evidence on the interactions between prior attainment, gender and group composition than there is for either ethnicity or pupils identified as gifted and talented. These have been highlighted as gaps in the literature that may deserve further research. The second area is focused not on group composition overall, but on the effects of different types of grouping strategies on individuals who have these characteristics.

Gender
The relationship between group composition and gender has been referred to several times earlier in this review (e.g. D.1.5, & D.2.3.1). Where setting is used, the higher proportion of boys in lower sets is likely to be related to attainment and social class, and separating out these variables is challenging. In addition, Dyson, Farrell, Hutcheson & Polat (2004) confirm the higher proportion of boys identified as having special educational needs (SEN, whether relating to attainment or not), thus complicating this relationship further. The difficulties of developing and sustaining an achievement culture in lower sets in which boys from lower socio-economic backgrounds identified as having special educational needs and with lower prior attainment predominate, is a major challenge to schools in adopting a system of setting.

The interaction between gender and within-class grouping is explored in D.1.5 in which it was noted that lower attaining boys were more likely to be found working as individuals or in small groups. It was noted in that where within-class grouping was based on attainment, this accentuates gender differences and teaching assistants were most likely to be found working with boys that were low attaining and assigned individualised tasks. In both sections D.1 and D.2.4.1 the relationships between friendship, gender and attainment are discussed, in the latter section in relation to transfer from primary to secondary school.

The Raising Boys' Achievement Project (Younger & Warrington, 2005) has repeatedly stated that it is not all boys who underachieve and not all girls that are making good progress and that it is important not to exaggerate or over-simplify the gender differences. Working with over fifty primary, secondary and special schools in England, they identified strategies which appear to have the potential to make a difference to boys' (and girls') learning, motivation and engagement with their schooling and subsequent achievement. They classified the strategies adopted by these schools under the broad headings of pedagogical, organisational, individual and socio-cultural. Within the organisational category the authors included schools adopting single sex classes as a mode of organization in co-educational schools.

The analyses of attainment and of pupils' perspectives across the schools adopting some single-sex teaching led the researchers to report significant gains in attainment, in particular for boys in English and modern languages and for girls in mathematics and science - with pupils feeling more at ease, less inhibited and able to show real interest. However, positive outcomes required some pre-conditions including a proactive and assertive approach conveying high expectations and challenge, regular and consistent use of praise, establishing a class identity characterised by teamwork, humour and informality and promotion by senior managers to staff, pupils, parents and governors, of single-sex teaching as an achievement strategy not a temporary experiment. Furthermore, single-sex

classes were not a universal remedy on their own and in some schools, boys-only classes became very challenging to teach, with stereotyped expectations exacerbating a macho regime and thus alienating some boys. Even in the most successful schools, both boys and girls said that they did not wish to be in single-sex classes for *all* lessons.

The impact of different forms of grouping on individuals according to gender has been subjected to a detailed analysis in relation to the experiences of girls in groups set for mathematics by Boaler (1997a, b & c). She reviewed the evidence suggesting that girls prefer co-operative, supportive working environments whereas boys work well in competitive, pressurised environments. She argued that such claims about the gendered preferences of pupils are important to our understanding of differences in motivation, engagement and achievement. These findings inform the debate in school mathematics about the need for greater experiential, open and discursive styles of teaching and, again, the findings do not compare with classrooms practicing social inclusion and group training for all pupils (see E.1).

In her seminal study (Boaler 1997a, b & c) of pupils in two comprehensive schools using contrasting organisational grouping arrangements in mathematics, Boaler also reported some (limited) pupil comments made concerning their within-class groups. When girls reported positive experiences (both in their set or mixed ability classes) these experiences were associated with increased depth of understanding and involvement, using their own ideas, working as a group or working at their own pace. In contrast, boys rarely mentioned their experiences of group work in set or mixed ability classes; although when groups were mentioned, boys were ambivalent towards their classes and complained that group work slowed them down. Unlike the girls, boys perceived the aim of their mathematics classes to be to get through the work quickly rather than to understand topics in depth and group work was seen as a hindrance to this. And, this series of reports by Boaler and colleagues focused on pupils' classroom experiences where no training for group working was undertaken.

Boaler found that a third of the girls in the top sets in mathematics were severely underachieving. She noted the assumption, drawing on attribution theory and the concept of 'learned helplessness', that girls are somehow psychologically unable to cope with the demands in mathematics teaching. In contrast, Boaler argued that the pupils themselves attribute their 'underachievement' to the mathematical pedagogy and practices they experienced, including the specific style of teaching characteristic of 'top sets' which related to pace, pressure, closed approaches which did not allow them to think and a competitive environment. Open work, discussion and co-operation were seen as more likely to lead to understanding. The difference between the achievement of girls and boys that emerged in Boaler's study appears to relate to their capacity to adapt to an approach they disliked and did not feel enhanced learning.

Ethnicity
Since the highly controversial publication in 1971 of Bernard Coard's pamphlet *How the West Indian Child is Made Educationally Subnormal in the British School System* in which he suggested that low expectations and low motivation were causing failure, there has been surprisingly little research on the detailed classroom processes that contribute to lower ethnic minority achievement in African Caribbean boys. A recent Ofsted survey (2004) suggests that more staff in secondary schools are engaged in the debate and the use of more detailed monitoring data has revealed patterns of achievement within schools disaggregated by ethnic group.

Earlier in this review, research was cited concerning the over-representation of some ethnic groups in lower sets in secondary schools although it is important to disaggregate social class, prior attainment and ethnicity which are closely interrelated. Gillborn & Mirza

(2000), in a literature review for Ofsted, reiterate this finding stating that Black pupils and their white working class peers were over-represented in lower-ranked teaching groups. They attributed this to processes influenced by differential teacher expectations, which they suggested tend to be lower for these pupils and that placement in these groups then institutionalised these differences still further. Tennant (2004) explored classroom interactions between teachers and pupils from different ethnic origins and reported that African Caribbean children were interacting with teachers at a greater rate than other children, mostly for behavioural or administrative reasons. He contrasted this with the interactions between Asian pupils and teachers where the interactions were fewer overall but relatively high for teaching purposes. There is little coverage in Gillborn & Mirza or elsewhere on the specific evidence relating to composition of groups or the impact of grouping strategies on pupils from minority ethnic groups and this is identified here as a priority for further research. It should also be noted here that the literature needs to be cautious with regard to over-generalising about achievement of African and Caribbean boys, as there are many examples of male academic success in various schools in England and in their countries of origin.

Pupils identified as having Special Educational Needs (SEN)
Teaching pupils with SEN has been argued to provide key opportunities to reflect on the quality of teaching more generally. Ainscow & Hart (1992) suggested that the difficulties presented by some children in a lesson stimulate the reflection and reconsideration needed to recognise the limitations of the current provision. So, the presence of pupils with SEN in a teaching group may, for example, give rise to alternative explanations, modelling or demonstration that enables others (not identified specifically as having SEN) to develop greater understanding. This position is essentially an inclusive one but has not been rigorously empirically researched.

As with ethnicity, pupils identified as having SEN cannot be treated as a homogenous group. Pupils having SEN may range from those who are disruptive and challenging to those with sensory or physical difficulties and pupils with learning difficulties of different degrees. The challenges of providing both organisational and within-class grouping that enhances their learning vary according to the nature of the need and whether it is temporary or permanent. In most mainstream schools, pupils with physical or sensory difficulties are included and seen to be participating in regular activities once practical problems are overcome.

Evidence (e.g. Wilson, 2000) on the composition of groups in organisational grouping strategies such as setting has predictably found higher numbers of pupils with identified SEN in lower sets. Similar to ethnicity, the interactive effects of social class, gender, ethnicity and SEN are only beginning to be appropriately disaggregated in the research. Ireson et al. (2002) noted that a small number of secondary school departments considered the pupils with SEN when undertaking across year group allocation. In some schools, pupils with SEN were concentrated into a smaller number of classes to assist in allocation of teaching assistant time.

The two types of pupil that present the greatest challenge are those with social, emotional and behavioural difficulties and those with significant learning difficulties. These pupils were traditionally taught in special schools and for different reasons would have experienced limited group work. Sebba, Byers, & Rose (1995) argued for greater use of group work with pupils with significant learning difficulties on the grounds of the need to develop sociability and personal experience of it enhancing their learning, and gave examples of effective practices in doing so. Elsewhere in this review, a strong case is made for the need to teach group work skills and both pupils with SEN and their teachers will be likely to benefit from this. Working in pairs is recognised (e.g. Rose, 1998) as an important first step for some pupils.

Marvin (1998) provides an account of the ways in which group work with pupils with learning difficulties can promote greater inclusion, including issues in planning group work, adaptations of 'jigsawing' (Aronson, Stephan, Sikes, Blaney & Snapp, 1978) and managing it in the classroom. In the same vein, Rose (1998) argues for the use of group work in developing skills in negotiation and decision-making in pupils with SEN. The research evidence on the impact of grouping strategies and within-class group work on pupils with SEN is very limited (and some further evidence in relation to primary school will be published in Ota & Berdondini, in preparation).

Dyson et al. (2004), analysing the relationship between inclusion and attainment, concluded that highly-inclusive schools that were also high performing were more likely to use flexible grouping strategies, reflecting individual needs and carefully monitored to enable changes to be made in response to negative consequences. These schools (and some of the lower performing, inclusive ones) were not 'fully inclusive' in the sense that all children are involved in all mainstream lessons the whole time. Rather, they adopted pragmatic approaches reflecting a school level commitment to 'do the best by all children', with varying degrees of individual, small group, segregated and mainstream provision. The extent of setting adopted across year groups and subject areas showed a similar variation in these schools as a group, as in the national population. The flexible use of teaching assistants was noted to be important in ensuring that groupings were not rigidly applied, through offering in-class support, small group withdrawal or resource bases. The researchers noted that the case study schools emphasised the recruitment of high quality teaching assistants and training them thoroughly.

<u>Pupils identified as Gifted and Talented</u>
The evidence of the impact of setting on pupils who are gifted and talented was reviewed by Freeman (1999) and Rogers (2002). They noted that pupils identified as 'highly able' were most often reported to benefit from setting or specific grouping strategies that bring them together in the same group. Pupils who were exceptionally able may try to hide their talents in mixed-ability classes (e.g. Butler-Por, 1993 cited in Freeman, 1999). Freeman noted that at least one large scale study in the US suggested that while gifted pupils appeared to benefit socially and emotionally from mixed ability groups, they did not help lower ability pupils to learn. Other studies have shown that in within-class group discussions, pupils identified as gifted and talented were not always as willing as others to share their ideas and thinking. Some studies reviewed suggest that pupils teaching one another can be beneficial in mixed-ability groups that include pupils who are gifted and talented, depending on the content and structure of tasks (and, it should be noted that training for group working skills may be of benefit for these pupils as well, see E.1). So the characteristics of pupils may be a further factor to consider in the complex interaction between group size, learning task, knowledge and social relationships and working interactions.

Approaches to meeting the needs of pupils who are exceptionally able through a range of grouping strategies were reviewed by Freeman (1999), Rogers (2002) and Lowe (2002). Strategies adopted for whole groups of pupils identified as gifted and talented included separate specialised full-time programmes and teaching groups which were constructed across year groups by prior attainment and needs in a specific area, typically reading or mathematics (known as vertical grouping). Some schools had constructed groups of pupils who are gifted and talented within classes and compressed the curriculum for that group, giving them extension work or self-organised study. Strategies provided on an individualised basis included early entry into the next phase of schooling, for example into secondary, moving up a year within a school without completing the year before or acceleration within a subject such as working with a different year group for one subject, which is typically used in mathematics.

The evidence on the effectiveness of these approaches in raising standards and reducing underachievement for pupils identified as gifted and talented was reviewed in detail by Rogers (2002) who drew conclusions from 13 research syntheses. She suggested that full time specialist programmes were the most effective in academic gains and attitudes for those pupils, constructing separate groups within a mixed class which was taught by someone specifically trained was effective in terms of academic gains, and other small group strategies such as subject acceleration and vertical grouping led to substantial gains for those pupils. Acceleration was variably effective depending on the context, the flexibility, the number of other pupils involved and the age at which it was done (Freeman, 1999). What is not evident from this literature, is the consequent effects on other pupils in the class or school of adopting these strategies for one group of pupils.

D.2.3.6 Impact of grouping in different curriculum subjects
There appears to be little specific research disaggregating or comparing effects in different curriculum subject areas except for that reported above by Ireson et al. (2002) showing progress in Key Stage 3 to be influenced by mathematics set but not by English or science set. In contrast, Slavin (1990) reported that a number of North American studies showed attainment advantages for pupils studying 'social studies' in mixed-ability classes. Some of the studies reported in this review specify that data were collected in particular subjects. In the SPRinG project, Key Stage 1 focused on English and mathematics, Key Stage 2 on science and Key Stage 3 on all three core subject areas but no specific comparative data are available. The research undertaken by Boaler, reported in the previous section, focused just on mathematics and some of the issues are specific to mathematics, for example, the higher level of setting (see Table 1) and explanations given in the literature for girls' underachievement in mathematics. Furthermore, single sex teaching has been targeted at subjects in which boys or girls are seen as underachieving.

There are two areas of research that have not been the focus of group work but which include group work processes and which may offer some perspectives on the subject specific issues in within-class groupings. One is thinking skills and the other is assessment for learning, both of which require within-class group work since one key element of thinking skills work is collaborative inquiry and feedback and in assessment for learning, peer assessment is a central element. In the primary thinking skills work, Robertson (2002) reports on pupils' constructs of what helps them to learn in numeracy and noted that children are expected to express ideas, explanations and reasons, offer suggestions, agree and disagree with peers, ask questions and reflect on their own learning. Pupils as young as 5-6 years of age were able to give reasons of why these processes helped them, e.g. 'If you listen, you hear your friends' ideas and that gives you some and then you can help to solve the problem' (p.59). These pupils were observed during numeracy lessons to listen to their peers and give explanations in pairs and small groups. They saw the relevance of numbers to their everyday life (e.g. shopping, cards) and were concerned to 'get it right' which they believed that they were more likely to do if they worked together on it. This perspective of 'getting it right' may be more prevalent in mathematics than some other subjects and later develops into learning valid procedures and understanding the concepts on which they are based (Black, Harrison, Lee, Marshall & Wiliam, 2003). A similar approach was adopted by Webb and colleagues (Webb, 1991; Webb & Farivar, 1999; Webb & Mastergeorge, 2003) in mathematics classes in secondary and middle schools in the United States. Webb found that helping, explaining and supporting skills used in group conversations were associated with higher levels of attainment, and that pupils could be provided training programmes (in their classes) to enhance these skills.

In the area of assessment for learning, Black et al. (2003) have highlighted that the subject disciplines (mainly science, mathematics and English in their research) create strong differences between both the identities and pedagogies of teachers. For example, they

found that the range of trajectories for learning was much greater in English than in science and mathematics. Teachers of science and mathematics regard their subjects as a discrete body of knowledge with specific aims whereas in English there is a range of goals which may be different for each student. The implications for group work, which is a strong feature of assessment for learning (see Appendix 4), will be that allocation of groups may be made on different bases and the nature of tasks chosen, both in general and specifically for peer assessment, may reflect these subject differences.

Black et al. (2003) suggest that when the goal is specific, the management of the process by the teacher may be tighter than when the goal is less well defined. They contrasted the ease with which teachers in English can set open-ended tasks, encourage debate and dissent and perceive this process to be contributing to their overall aims compared to their colleagues in science and mathematics. There are insufficient outcome data on a range of subjects in assessment for learning to evaluate the longer term effects of these differences and even if such data were available it would be difficult to disaggregate the effects of group work from those of assessment for learning in general.

D.2.4 Grouping and groups at Transfer

This section of the review on transfer and grouping draws largely on the evidence collected from two major research studies by Galton & Wilcocks (1983) and Hargreaves & Galton (2002). In addition, material collected for the recent DfES funded studies of transfer and transition (Galton, Gray & Rudduck, 1999; 2003) provides up-to-date information. Transfer both in the UK and elsewhere (Anderson, Jacobs, Schramm, & Splittgerber, 2000) has been associated with a 'hiatus' or dip in pupil performance for around 40% of the pupils (at transfer) and also a drop in school enjoyment and attitudes to core subjects. This decline in attitude is greatest among more able pupils (Galton, Gray & Rudduck, 2003). Explanations for these dips usually point to the lack of continuity between the transfer and feeder primary schools in terms of the curriculum and the differences in the way teaching and learning is organised across the school and within the classroom.

One major feature of the move to 'big school' is the change in classroom organisation. While at primary school pupils, for the most part, sit on tables consisting of 'mixed sex' groups of between four and six, the arrangement at secondary level is more likely to consist of 'same sex' pairs, sitting in rows and facing the front of the class (also identified in Kutnick et al., 2005). These organisational changes are an important outward sign of the 'status passage' (Measor & Woods, 1984) marking the transition from being seen by teachers as children to becoming viewed as young adults expected to take greater responsibility for the management of their learning.

In the past some schools, particularly those catering specifically for the 'middle' years, attempted to reduce the effects of the organisational change associated with transfer by retaining the primary structure during the year following the move to the new school. Pupils continued to sit in groups rather than rows and, as far as possible, one teacher took responsibility for all the teaching. The use of such arrangements has decreased significantly since the introduction of the National Curriculum and the greater emphasis on specialist subject teaching at primary level. The more recent move by some LEAs to eliminate their middle schools and revert to a two-tier system for the age group 5-16 has also hastened its decline.

In any case, the benefits of such arrangements appear mixed. While maintaining a 'primary ethos' in the first year at the new school did reduce pupils' levels of anxiety in the immediate period after transfer, anxiety increased significantly by the end of the summer term compared to pupils who transferred into a secondary ethos (Galton & Wilcocks, 1983). Many of the causes of pupils' initial anxiety were due to being placed in forms or

'sets' with possible separation from existing friends, and this now took on a huge significance around the period of the Year 7 summer term examinations when arrangements for the following year were decided (Galton & Wilcocks, 1983). In addition, there is some limited evidence that the dip in attainment following transfer to middle schools may be marginally greater than the dip where transfer is effected at the end of Key Stage 2, although in the sample studied not all middle schools retained a primary ethos in the first year (Suffolk LEA, 1997; Hargreaves & Galton, 2002).

Recently, a number of secondary schools have partially adopted the strategy of retaining a primary ethos for pupils who transfer from Year 6 with either learning or behaviour problems. However the effects of retaining a primary style classroom organisation are often confounded with class size since the pupils with learning or behavioural difficulties are generally placed in classes of 20 or less compared to a more typical teacher-pupil ratio of 1:30. In the case of an unpublished evaluation (Galton 2003) carried out for Suffolk LEA, the secondary school in question received an intake where 50% of the pupils had failed to reach level 4 in either literacy or mathematics at Key Stage 2. The results showed significant improvement both in pupil attainment and attitude. On re-taking the KS2 National Tests at the end of the year all pupils in the reduced size classes gained at least one whole level with over 33% gaining two or more. Of equal or greater importance was the finding that pupils' motivations became effort rather than ability-orientated. Over the course of the year, behaviour improved with a marked reduction in truancy.

While the evidence from one case study cannot be taken as conclusive, the Scottish Executive Education Department (SEED, 2005) has recently commissioned an evaluation in a number of schools where classes have been reduced to twenty for English and mathematics in the first and second years of secondary school. Attempts are being made to introduce a primary style of organisation using successful practitioners as coaches. The aim of the investigation is to assess the likely impact of rolling out a programme which would see all secondary schools implement similar arrangements. The evaluation is due to report in November 2006.

Leaving aside the impact of these special arrangements associated with class size reduction, recent studies of transfer (Hargreaves & Galton, 2002) show that the different styles of classroom organisation at primary and secondary level appear to have very little effect on the nature of the classroom interaction taking place during the teaching of the core subjects (English, mathematics and science). The proportion of different types of teacher task oriented questions (factual, open, closed) and teacher statements (factual, ideas, directions, routine) were almost identical in the Year 6 and Year 7 classrooms where observation took place.

D.2.4.1 Friendship Groups at Transfer

When interviewed about transfer, pupils assign a high priority to making new friends while wishing to keep some existing friends from primary school. In allocating pupils to classes most secondary schools therefore take account of current friendships. Based largely on the information received from the primary school, Year 7 coordinators will attempt to ensure that each pupil has at least one close friend from primary school in the same tutor group but will separate him or her from any friends who are reported to exert a 'bad influence' (Galton, Gray & Rudduck, 2003)

Rudduck, however, in Galton Gray & Rudduck (2003) suggests a different approach. She found that there were clear gender differences in the way that friendships operated and potentially affected learning. In particular, girls tended towards intense relationships that were inclusive of school activities. Boys' friendships were more likely to be oriented towards undertaking shared activities, and rarely included school concerns. Pupils used

friends in different ways, sometimes valuing complementary skills and sometimes different skills, depending on the nature of particular tasks or the demands of particular subjects. Teachers were largely unaware of pupils' perceptions of friendship and learning and were therefore unable to build on them in supporting different learning preferences.

Rudduck also found that some students liked working with friends who were similar in ability to themselves (symmetrical partnerships), while others liked working with friends who were different from themselves, either in levels of competence or ways of thinking (asymmetrical partnerships). The subjects mentioned most frequently by pupils where they need support from a student who is 'good' at the work were mathematics (primary and secondary schools) and modern foreign languages (secondary schools). There were also subjects and tasks (English, for example, and planning stories) where students said that they could help each other, as equals, by offering different ideas*.* Pupils in high sets but who found the learning a struggle said the presence of a sympathetic friend was both a source of psychological and intellectual support, particularly during group discussion and whole class question and answer sessions.

Rudduck concluded that teachers should recognise that pupils have quite a sophisticated capacity for perspectives in structuring working groups and maintaining a more open view of the social and academic potential of friendships and should therefore make more use of this pupil knowledge in determining whom they are likely to work with and whom they don't work well with. However, although schools taking part in Rudduck's research reported positive results in terms of pupils' motivation and attitudes, no formal assessments of learning have been reported. Given the evidence cited elsewhere (for example, Kutnick & Kington, 2005) concerning the impact of friendship groups among low attaining boys, further studies which include performance measures would be valuable.

D.2.4.2 The impact of organisational grouping at transfer

As described in a previous section, secondary schools adopt a variety of arrangements for coping with the range of abilities across their annual intake. Typically, a school will create mixed ability form tutor groups, although in some cases the range of ability in each form will be reduced by creating a number of different levels or bands across which the tutor groups are distributed. Where tutor groups comprise of pupils of all abilities, it is usual to create sets for mathematics and science and, less frequently, in English (also see Table 1). Sets are allocated either from the beginning of the school year or after the first half term following an internally set examination. Even when pupils are placed in sets at the start of the school year, it is not unusual for schools to set an internal examination after the first half term in order to make minor adjustments to the sets. In the DfES funded research on transfer and transition (Galton, Gray & Rudduck, 2003) the majority of schools visited in 9 LEAs employed an internal assessment early in Year 7, including use of the NFER Cognitive Attainment Tests (CATS).

 No transfer studies have looked at dips in attainment relative to the adoption of different setting arrangements, partly because the small samples do not allow for meaningful generalizations. In Hargreaves & Galton (2002), for example, two of the transfer schools occupied the same site and drew their intake from the same set of feeder primary schools. In one case, the school adopted a policy of setting pupils at intake for all subjects while the other school had three broad bands with a number of parallel forms in each band. The school adopting the banding system produced significantly better results both in attainment and attitudes to schooling (medium to large size effects in English and mathematics and enjoyment of school) compared to the one adopting setting.

Whatever allocation system is adopted, secondary schools face a problem in making these allocations because of the delays in obtaining the results of the Key Stage 2 National Tests and because, as the widespread use of CATS and other internal assessments signifies

(Ireson et al., 2002), many schools still feel there are disparities between the levels gained at the end of Year 6 and the pupils' subsequent performance at the start of Year 7. As far as possible, secondary schools like to settle the composition of tutor groups by the end of June (before entry into the secondary school) so that pupils can meet their teacher tutor and the rest of their classmates on Induction Day; thus removing any potential anxieties about not being placed with friends before the start of the summer holiday. For this exercise, secondary schools have to rely on teacher estimates.

Schools that attempt to set by ability across all subjects find themselves in some difficulty because considerable re-arrangement of classes may be necessary once the Key Stage 2 National Test scores become available. Those who adopt a broader banding system are likely to experience fewer problems in this respect and may well delay any further adjustment until half way through the autumn term when internal examination results as well as those from the National tests are available. Attempts by some LEAs such as Durham, Essex and Suffolk to speed up the data transfer from primary to secondary schools using specially constructed computer packages have helped to streamline the process but the timing of the National tests remain a problem with respect to allocating pupils to sets or bands in their new secondary school in advance of the start of the autumn term.

Partly because of the information availability problem at transfer, some schools have started to adopt a different strategy by developing post-induction programmes which delay decisions about setting and banding until after the autumn half term in late October. The purpose of these induction programmes is to help pupils acquire skills as autonomous learners thus becoming what has been termed 'professional students'. Pupils in the first few weeks of the new school year concentrate on developing appropriate study skills, identifying learning styles, understanding the fundamentals of working cooperatively in groups as well as exploring the use of different thinking and problem solving strategies. Thus the emphasis is largely focused on *metacognitive* aspects of learning. These activities generally take place in mixed ability tutor groups. Schools argue that the confidence built up over the course of these first few weeks is a result of the post-induction programme, and reduces levels of anxiety which might arise because of the likely disruption to recently formed friendships, consequent on the rearranging of tutor groups as part of the allocation into bands or sets. As yet, however, this assumption has not been tested by any systematic evaluation.

E Programmes and practices to enhance effective group working within classrooms

In the research literature, within-classroom group work is often made practical (for incorporation into classrooms) via co-operative or collaborative groups. This review has emphasised that group work should not be limited to the experience of co-operation or collaboration (Blatchford et al., 2000). This is because there does not appear to be common agreement over the variety of group sizes and learning purposes that may be drawn upon for effective group working or a clear, singular theory to explain why groups might work effectively for learning. Usually, co-operative group work is defined as pupils being assigned to separate sub-tasks which are brought together in a joint group outcome. Collaborative group work, by contrast, is defined as pupils being assigned the same task and sharing in a joint group outcome (Aronson et al., 1978; Slavin, 1983; Johnson, & Johnson, 1987). Neither co-operative nor collaborative group work is commonly found in the naturalistic studies of classrooms (Galton et al., 1999). It is more likely that children are found to sit in a variety of group sizes in both primary and secondary school classrooms, and these groupings rarely receive any training to work effectively as a group (Kutnick et al., 2002; Kutnick et al., 2005). Thus, depending on their pedagogic and curriculum purposes (as well as class size, furniture within the classroom, etc.), many teachers carry out teaching and learning activities by simply dividing their classes into 'convenient' groups of various sizes, often defining grouping by attainment level. These convenience groupings often limit the participation and understanding of children. The studies cited below identify how group work can be made more effective (with regard to learning and motivation) especially if pupils/groups in classrooms are trained and allowed to use supporting listening, asking, challenging, questioning, and explaining skills.

E.1 Training pupils in group work skills and attitudes
Throughout the review, it has been emphasised that practices of effective within-class group working may involve a larger range of groupings than typically seating of children in small groups (of 4 to 6 children). In fact, social pedagogic implications of Table 3 identify that there are different learning tasks that may be assigned to children working as individuals, in pairs, in large groups and as a whole class (Kutnick, 1994; Merrett, 1994; Jackson, Kutnick & Kington, 2001). If these groupings are to work effectively a variety of support, listening/responding and focusing skills will be needed.

As identified in Galton et al.'s study (1999), children in groups do not necessarily or spontaneously engage in group working or display the skills that may enhance their learning. Indeed, it is quite rare that group work is successful at first attempts and several group work studies emphasise the need for a period of initial work or training to be undertaken in order to develop group trust, cohesion and norms that are supportive of group working. One of the few studies concerned with training primary-school aged children in practising group work was carried out by Kagan (1988). He showed that training can improve both the quality and the effectiveness of group work. Kagan suggests that teachers have to offer their pupils the possibility of practising "tolerance and mutual understanding, the ability to articulate a point of view, to engage in discussion, reasoning, probing and questioning" (Kagan, 1988). The use of training to enhance group working was the background to the ESRC/TLRP study 'Improving the effectiveness of pupil groups in classrooms' (the SPRinG[3] study undertaken by Blatchford et al., 2005)

A search through studies of effective group working and co-operation in schools (prior to the development of the SPRinG project) found training issues and procedures rarely addressed (for example, Johnson & Johnson, 2003; Webb & Farivar, 1999). When training procedures are used in (a limited number of) studies, the design/structure of the

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[3] The term SPRinG is a shortened form of social pedagogic research into grouping.

training is derived from particular theories underlying group working (see Appendix 3). For the most part, group work training programmes tend to be based upon behaviourism in that they identify 'normal' group working skills and create procedures to teach these skills to individual children. Other programmes place greater focus on social cognitive actions and developing social relations. Differences between theoretical bases to these programmes are seen in their classroom practice, and it is evident that there is a fundamental difference between skills and relationally oriented programmes:

- Behaviourally oriented social skills programmes teach specific behaviour (deemed essential to communicate, support, etc) often outside of the context in which the skill may need to be applied (Ogilvy, 1994) while the relational programme develops the skills within the context (usually classroom) in which the skill will be used and with the child who is to benefit from the skills.
- Social skills breaks down a behaviour with subsets of skills, assesses a child for the presence of this subset and 'teaches' the child any skills not yet attained. The development of these skills should also be coupled with the appropriate acknowledgement of the achievement of group success (Galton & Williamson, 1992). The relational programme broadly draws upon integrated skills.
- The relational programme is premised on the establishment of supportive and trusting relationships before and during group work in class, hence promoting an inclusive, whole-class approach. A social skills programme does not necessarily plan for this development of close relationships, these relationships may develop if the children are able to reflect on a positive skills-based group experience. Hence, a social relational programme may be seen to promote classroom social inclusion and the generation of group working norms while the individualistic social skills programmes are de-contextualised and do not attempt to account for relational development (Blatchford et al., 2003; also see further discussion on theory in Appendix 3).

In Circle Time programmes (Bliss, Robinson & Maines, 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 far less 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; described in Appendix 3.4) 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 & 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. These activities are specifically designed to develop pupils' performances in these areas (Webb, 1991), and have much in common with the previously identified social relational approach to effective group working.

Wilkinson & 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). A number of these skills, especially related to speaking, listening and explaining have been integrated into the DfES Key Stage 3 National Guidelines as well as certain aspects of information related to group size and composition within classrooms (2004; also see Appendix 4). As already mentioned (section D.2.1), studies that identify effects of the individual skills listed above tend to focus on particular skills and do not integrate interpersonal support with the skills.

One study that does integrate communication activities with interpersonal support in the classroom is 'dialogic teaching' (Alexander, 2004). Alexander argues that classroom activity, including group work, is based on dialogue - but this focuses on the organisational aspects of the pedagogy and 'not what matters most: the quality, dynamics and content of the talk.' Instead he points to the increasing use of the term 'dialogic teaching' to promote a 'community of enquiry' where 'learning is not a one-way linear communication but a reciprocal process in which ideas are bounced back and forth' (Alexander, 2004: 22). Successful dialogic teaching must encompass the following five principles in that it should be (ibid: 34):
- *Collective*: teachers and children address learning tasks together, whether as a class or as groups;
- *Reciprocal:* teachers and children listen to each other, share ideas and consider alternative viewpoints;
- *Supportive:* children can articulate their ideas freely, without fear of embarrassment over 'wrong answers' thereby helping each other to reach common understandings;
- *Cumulative:* teachers and pupils build on their own and each others' ideas and chain them into coherent lines of thinking and enquiry;
- *Purposeful:* teachers plan and steer classroom talk with specific educational goals in view.

Dialogic teaching therefore attempts to minimise the use of rote, recitation and instruction talk in favour of discussion and dialogue. In the latter, the teacher and pupils (or groups of pupils) "achieve common understandings through structured and cumulative questioning which guide and prompt, reduce choices, minimise risk and error and expedite 'handover' of concepts and principles"(ibid: 34). Pupils must acquire a 'repertoire of learning talk,' most of which have been shown to correlate positively with effective group work, such as explaining, arguing, reasoning, negotiating and listening. Working with teachers in North Yorkshire and in Barking and Dagenham, Alexander has been able to bring about a perceptible shift in classroom culture where there is a discernible change in questioning strategies away from the more common forms of 'cued elicitation' and 'recitation.' Reading and writing of all the children, particularly the less able, benefited from the increased emphasis on talk in these classrooms (ibid: 40-41). Not all teachers seemed able to change, however, which points to tenacity of the *direct instruction* model of pedagogy within the English school system. For this reason Alexander suggests it is better to concentrate on the first three principles (*collectivity, reciprocity and support*) in the initial stages, since cumulation also requires teachers to re-structure and re-sequence subject matter in ways that allow them to 'scaffold' pupils' thinking 'from present to desired understanding' (ibid: 45)

The SPRinG programme described below is an example of an innovative, integrated programme that has been found to affect pupil attainment, motivation, interpersonal behaviour and teacher approach.

E.2   The SPRinG programme: implementation of a relational approach Key Stages 1, 2 and 3

The SPRinG project aimed to improve the effectiveness of pupil groupings within classrooms in Key Stages 1 – 3 (Blatchford et al., 2005). The project took place over a four year period, with the collaborative involvement of teachers and researchers; and was based on the development of a relational approach (see Appendix 2) within normal classrooms – hence working on a model of social inclusion to promote effective grouping that could be applied in all classroom circumstances (and across curricula). The project compared SPRinG and control classes and grouped/non-grouped activities within classes. Measures of success included academic achievement and motivation over a full school year and more intensive measures of classroom interaction, collaborative problem-solving and use of communication skills. While not strictly relevant to this review, KS1 results were based on attainment, attitudinal and observational measures of 985 pupils in 38 SPRinG or control classes. A brief summary of results show that in SPRinG classes:

- pupils improved significantly in reading and mathematics scores (on PIPS tests) over the year, and
- their teachers were more inclined to teach in a range of groupings (as opposed to individualised and whole class) as the year progressed.
- in addition, within-class developments showed that SPRinG children were more likely to be engaged on-task, supportive in communication and reciprocally aware in communication in working with their partners than children in control classes.

Anecdotally, teachers consistently spoke of improved social behaviour in their classrooms and in the playground, children's ability to integrate SEN and other children into their groups without teacher prompting, and children taking responsibility for keeping themselves and others on-task (taking a number of procedural responsibilities on themselves rather than relying on the teacher). Extended analyses are currently being undertaken with particular focus on pupils with special needs and the role of teaching assistants.

At Key Stage 2 (7-11 years) the main aim was to test the effectiveness of SPRinG by comparing pupils trained in group work with those who were not. The evaluation was concentrated on progress in science. 'Macro' attainment data for science were supplemented by focused 'micro' science tests on evaporation and forces before and after lessons involving group work (intervention) or the teacher's usual approach (the control group) to teach these topics. Motivational/attitudinal measures came from pupil self completed questionnaires. And, measures of classroom behaviour came from on-the-spot naturalistic systematic time sample observations, and analysis of videos of groups in SPRinG and control classes. The KS2 study involved 849 pupils in 32 classrooms and 1027 pupils in 40 classrooms in the experimental and control groups respectively.

Despite teachers' fears that group work might interfere with coverage of the curriculum, SPRinG pupils showed:

- greater progress over the year in the general science test and sub-sections covering evaporation and forces than children in control classes, and more progress during the focused lessons on evaporation.
- systematic observations indicated that SPRinG pupils engaged in more group work, engaged in more interactions with other pupils and more of these were on-task and fewer off-task. Moreover, pupil-pupil interactions tended to be longer and involved more high level talk.

- involvement in SPRinG seemed to stop differences found to be developing in the control group between boys and girls and pupils of different attainment levels, and seemed to arrest a decline in attitudes to subject areas found in the control group.

At Key Stage 3, teachers face considerable problems seeking to increase the proportion of group working within class. Unlike primary colleagues there is little flexibility in the timetable, contact between teacher and pupils can be limited to three or four 40 minute periods per week and the curriculum is often made up of a series of discrete units that have to be completed within a set period of time in order to conduct regular testing as part of target setting. An effective group activity will often take up a disproportionate amount of time requiring teachers to introduce additional pace into other parts of the unit in order to cover the required content and not disadvantaging pupils when it comes to taking the test.

Nevertheless, the results emerging from the SPRinG Project at KS3 suggest that despite such problems, increased use of groups is a worthwhile strategy in helping to stem the gradual decline in attitudes and motivation which is a current manifestation of what pupils in Galton, Gray & Rudduck (2003) describe as the 'fallow years' of secondary schooling. In both mathematics and English, working in groups with SPRinG training was significantly more effective than working individually, and there are small to medium positive size effects when the performance of pupils who tackle a topic in groups is compared with those who undertake the same tasks principally through whole class instruction. Perhaps more important is the impact on motivation of groups of pupils whose initial attitudes can best describe them as belonging to an '*anti-learning, anti school'* culture. Recently, Ofsted (2005) have commented on the deterioration in behaviour in secondary classrooms and estimated that around 50% of pupils observed showed challenging behaviour. This figure corresponds closely to that emerging in the SPRinG analysis for the number of pupils exhibiting '*anti-learning*' characteristics. The finding that in classes where group work appears to be effective the pupils express a strong preference for working in this way is therefore an important one, since they appear not only to improve their attitudes to learning but also, in the case of English, to perform better. Not all the classes studied were equally successful with these disengaged pupils. As with the work at Key Stages 1 and 2, a crucial factor appears to be the willingness of the teacher to spend time, initially, training pupils to work in groups, coupled with regular evaluations of the quality of the group work process.

E.2.1   Lessons from SPRinG: Pre- and de-briefing
As identified in the SPRinG and other studies, for group work to be effective it is important that children develop communication and social skills, especially through talking, questioning and discussing. Moreover, children should be aware of the aim and the process of group work in order to become more responsible, more empathic and more supportive to each another. Group work, itself, encourages these abilities; but it is also necessary to integrate the group activities with stages where children are given the opportunity to reflect not only on the task but also on the group process and on the social dynamics that may or may not have occurred during the group work sessions. Cowie & Rudduck (1988) and Salmon & Claire (1984) suggest that children vary widely in their perceptions of groups and in their capacity to negotiate their roles within the group. Some students express a sense of well-being in a group and a sense of responsibility towards their peers (Cowie & Rudduck, 1990). Salmon & Claire found that it was first necessary to establish a sense of mutual understanding within the groups, and a willingness to work towards shared goals.

On the basis of such findings, regular phases of pre- and debriefing by teachers within their classrooms are recommended (Smith, Boulton & Cowie, 1993; Cowie, 1994; Cowie & Berdondini, 2001; Stanford, 1990; Kingsley-Mills et al., 1992; Thacker et al., 1992; Farivar & Webb, 1991). During pre-briefing the task to be undertaken is explained to pupils and

they are asked about their concerns, expectations, and possible worries. In this phase children can be reassured and prepared in order to frame the ensuing activity and to explore its context. It is normally expected that pre-briefing is initiated by the class teacher but, over time, pupils will take on greater responsibility for this approach. Moreover they can also express their enthusiasm or resistance and share it with others. In a de-briefing session group members have the opportunity to reflect on experiences which they have shared. The aim of de-briefing is to help participants to be observant of what happens in their group, move towards a new level of understanding about the interactions within the group and become more responsive to the themes which the group has identified as being of importance.

Pre- and de-briefing phases can be seen as essential parts of group work experience and can take many forms; the phases can be directive or non-directive, structured or unstructured. A number of strategies have been developed to facilitate this process, including 'sitting in circle', 'passing the stone', 'the magic microphone' (Smith et al., 1993). Many different and flexible methods can be created for these processes, depending on the composition of the class and the age of the children. The importance of these phases is to give the pupils a space and a time in which to reflect, feedback, share and confront their feelings and ideas (Smith et al., 1993).

E.2.2. Lessons from SPRinG: The teacher's role in group work

Observational studies show that teachers use a variety of groupings in class although they rarely structure these groupings for co-operative, collaborative or other pedagogic purposes (Galton et al., 1999; Kutnick et al., 2002; Kutnick et al., 2005). As evidenced in their classroom actions, not all teachers like to undertake group working in their classrooms. Cowie & Rudduck's (1990) survey found that teachers expressed a range of liking to disliking of within-class grouping and group work. Reid et al. (1989) and Dunne & Bennett (1990) note that one of the benefits of group work is that the teacher has more time to assess the individual and group as a whole in relation to the social and learning processes taking place, although Galton and Williamson (1992) found that teachers prefer the whole-class approach. In their research, approximately two-thirds of the teachers stated that they used groups in their classroom but most teachers interactions observed were with individuals (72%), followed by the whole class (19%) and small groups (9%). Teachers are aware of the positive effects of group work (involving pupil discussions), but express concern that some children will become very susceptible to both positive and negative peer influence (Crockenberg, Bryant & Wilce, 1976). Also, teachers are aware that group discussions will mean that their classrooms are 'noisier' than other classes, and that teachers may be ridiculed by their colleagues.

Initial and anecdotal findings from the SPRinG study (Ota & Berdondini, in preparation) show that teachers that involve themselves and their classes in effective group working change their attitudes over time and in response to development of their pupils; a finding similar to the earlier reported study that applied SPRinG principles to secondary schools in the Caribbean (Kutnick et al., in preparation). From an early orientation that involves the teacher in all aspects of group working (often teachers will 'inject' themselves in group activities to ensure understanding of the task and efficient group processes), teachers have realised that pupils are capable of undertaking both procedural and learning aspects within group tasks. Once this realisation is made, teachers can adopt a more reflective (and less intrusive) approach to their relationship with pupil groups; a reorientation to their traditional classroom role.

Surveys and experimental/comparative studies (for example, Bennett & Dunne, 1992) show many differences between structured and unstructured groups. When small groups are organised by teachers, they are usually subject-oriented, with core curriculum groups most likely to be ability-related. While these curriculum-oriented small groups may be

referred to as structured, they rarely have the interpersonal and resource organisation that has characterised planning for co-operative learning (Gillies & Ashman, 2003); interpersonal organisation assigns personal and group responsibilities and may draw upon contact theory (from Allport, 1954) or social interdependence theory (from Deutsch, 1949), and resource organisation may call for distribution of curriculum subtasks to each group member for learning and teaching purposes (as found in Slavin's STAD design, Slavin, 1990). Curriculum-oriented grouping of pupils is strongly associated with perceived ability-level of children and will have differential effects of future achievement, especially limiting achievement of lower ability children (Ireson & Hallam, 1999; Boaler et al., 2000; Shachar, 2003).

Other research indicates that teachers may also group pupils for socio-personal reasons, which again does not have a pedagogic basis (Kutnick, 1994). Low attaining children, especially those with behaviour problems, are likely to be excluded from group working and made to work individually or with other low attaining children (Kutnick et al., 2002; Webb, 1989). Lewis & Cowie (1993) have found strong teacher resistance to the carrying out of debriefing activities after group work sessions, with a likely result that interpersonal problems encountered during group work will remain unresolved and causing lack of interest in future group work activities by teachers and children.

The teacher may attend to the composition of the group to ensure that other group members are supportive of pupils who are shy, disruptive or less able. While teachers show more involvement in organising the composition of within-class groups in primary schools (Kutnick et al., 2002), they rarely show involvement in group composition in secondary schools – except when confronted with a behavioural problem in the classroom (Kutnick et al., 2005). Even if classes are set, teachers will need to consider whether within-class groupings are differentiated by the range of attainment within the class or composed as a cross-section of attainment. If teachers propose to follow co-operative and collaborative grouping recommendations, they will want to ensure that there are low and middle attaining pupils in every classroom group (Johnson & Johnson, 1987; Aronson & Patnoe, 1997; and others). Webb (1989) modifies this recommendation somewhat; she notes that in a mixed ability class there may be communication problems in groups that include the extremes of high and low attainment. In preference, Webb recommends a 'banding' composition for grouping, such that some groups may be composed of low to mid-attaining pupils and other groups are composed of mid- to high-attaining pupils. Especially when group tasks involve discussion, group sizes should not be too large as this will impair group interaction (Battistich & Watson, 2003). In order to avoid disruption or non-participation, it may be important for the teacher to ensure that the task provides an appropriate level of challenge for heterogeneous group members, and this may be achieved by establishing varied task requirements for different group members or by providing differentiated materials (Reid et al., 1989; Daniels, 1994; Aronson & Patnoe, 1997; Johnson & Johnson, 1987).

Further, while there is evidence that teachers believe that the nature of the task is the key determinant of successful collaboration (Galton & Williamson, 1992), there has been a growing realisation that effective group working will require pupil 'training' for interpersonal interaction (Joyce & Showers, 1983; Webb & Mastergeorge, 2003; Gillies, 2003; and others). Teachers will have to decide where group work training may 'fit' into their classroom day – whether it is tied to a particular subject or has cross-curriculum application and whether group work training can be accommodated within a national curriculum. Once interpersonal training takes place, the teacher will still be responsible for appropriate task assignment, resource preparation and constructive support of group working, pre- and de-briefing.

E.2.3 Lessons from SPRinG: Curriculum Context and Group work

Focusing specifically on within-class pupil groups, there are variations in the extent to which group work support programmes are designed to be embedded in the curriculum either generally or within particular curricular contexts. In some cases issues of the domain specificity within particular curricular areas of skills are not addressed, whereas in others they are carefully considered.

The Circle Time/PSE approaches offer programmes which are separate from the curriculum. The skills developed and issues addressed are potentially relevant both to group work and to more general work within the curriculum. Such approaches assume that the skills, attitudes and relationships built up between pupils will have a positive impact on work done across (and within particular) curricula (Bliss et al., 1995.; Curry & Bromfield, 1998; Button, 1981; 1982).

In other cases, development of group work specifies a skills training period (see previous section on training) which is designed to be carried out independent of the curriculum. Following an initial training period, it is anticipated that basic group work skills and processes will then continue to be developed within a curricular context (Stanford 1990; Kingsley-Mills et al., 1992; Thacker et al., 1992). This type of approach thus requires that an amount of classroom time is devoted to the development of skills – the time allocated from a particular curricular area.

Thacker et al. suggest that a 'curriculum free' approach allows more focus on the skills and processes being developed, also giving these skills and processes greater status than if they were embedded in the curriculum from the outset. While activities during the group training period are specific and separate from the curriculum, activities suggested for the 'productive stage' are more general and therefore more easily adaptable to different curricular contexts (1992). This 'curriculum free' approach also characterises the social relational approach (described earlier in the Theory section) and social skills programmes (previously criticised by Ogilivy, 1994; and Kutnick & Manson, 1998). Further materials (such as that provided by Race (2000), Reid et al. (1989) and Dunne & Bennett (1990)) have been designed to be integrated into work across the curriculum; for example, Lloyd and Beard's (1995) programme is explained within the context of co-operative maths problem-solving activities but is intended to be adaptable to different contexts.

Some approaches have been designed to be used across the curricular range, but focus on particular learning tasks. Aronson & Patnoe (1997) and Slavin (1995) each describe their group work approach as suitable for learning some types of material but not others. Aronson & Patnoe suggest that their 'Jigsaw' method is only suitable for learning text-based material because it requires material to be covered in discreet sections by group members and then later to be integrated. Slavin's STAD (Student Teams Achievement Division) lends itself more to learning material requiring straight recall such as spelling or arithmetical facts. These strategies can be used across curricula but are reliant on working with particular types of material. In essence, the SPRinG project has been used across the curriculum range, and has highlighted how a relational approach needs to account for the Key Stage of pupils. Hence in KS1, teachers were able to introduce the approach in physical education and non-curriculum sessions and, as teacher and pupil confidence grew, the approach was applied to a range of subjects. In KS2, teachers and pupils worked similarly to KS1, but application to curricula took place earlier in the school year. In KS3, teachers and pupils, by necessity, began the relational approach within their curricular subjects.

Daniels (1994) has a more fundamental objection to the decontextualisation of skills and processes from curricular content. He argues that the divorcing of the organisational

mechanisms of the group from the meaning of material covered will undermine the thinking and understanding which the group work is designed to elicit. Instead he proposes that by encouraging group members to adopt particular and complementary literary roles and skills within his Literature Circles, group interaction is supported. In a similar vein, Mercer's (2000) extensive research on 'talk' in the classroom develops interpersonal and interactional skills among pupils through particular programmes to encourage scientific and civic understanding. Mercer's research, like that of Webb (see Webb & Mastergeorge, 2003), uses small groups as a contextual focus for curriculum tasks and offers pre-training experience to children to enhance the effectiveness of talk within the curriculum.

Thus the SPRinG project has highlighted a number of issues in classrooms. It has shown that training in group work skills has a beneficial effect on pupils for within-class group work, and improves pupil attitudes and performance. The importance of briefing and debriefing pupils before and after group work tasks has been emphasised, in order to increase their skills and understanding about working in groups. The role of the teacher in promoting group work skills has been reviewed. Finally, the study considered whether teaching group work skills is more effective when provided independently of the curriculum or embedded within or across it.

F   Conclusions

The conclusions are presented as the key points to emerge from each section of the review.

Three initial challenges encountered with studying organisational and within-class grouping

1. A focus on type of ability grouping as an *organisational strategy* may divert consideration from what is happening in relation to teaching, learning and attitudes within pupil groups in classrooms, and conceal the complexity of organisational grouping in schools.
2. The general lack of correspondence between seating/grouping and assignment of work/learning tasks has led to further analyses that explore social pedagogic implications of within-classroom learning.
3. Social pedagogy concerns the relationship between classroom organisation and interpersonal experience that may facilitate or inhibit school-based learning.

These three challenges, derived from the literature, highlight the need to recognise the complexity as well as the theory and practice of pupil grouping when trying to understand the social pedagogical conditions of learning.

Studies that explore the role of pupil grouping
- Research evidence on the impact of pupil grouping practices suggests that no one form of grouping benefits all pupils. Especially with regard to attainment, studies have not shown evidence that streamed or set classes produce, on average, higher performance than mixed-ability classes.

- Within-class grouping, within any context of organisational grouping, may have greater potential to raise standards through personalising the learning experience for pupils. Addressing the quality of 'social pedagogy' necessitates attention to peer to peer interactions as well as teacher to pupil interactions.

- A number of recent studies have sought to address the quality of social pedagogy by planning and undertaking theoretically informed interventions over time with the expectation that teachers and classrooms 'trained' in the use of particular orientations will 'internalise' group work practices.

Studies in primary schools
- Studies that have explored a pedagogic relationship between seating and teaching approach in primary schools have not identified a consistent relationship – as most teaching has been teacher-centred and focused on the whole class or individual child.

- Consistently presented in studies by Galton and his colleagues are findings to 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.

- Classroom learning experience of younger primary school children tends to be dominated by practice and revision. This is exacerbated by a traditional individualised seating arrangement. On the other hand, children are more likely to succeed in undertaking cognitive tasks when they work in pairs/dyads.
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The relationship between within-class group size and learning task

- Organising classrooms so that pupils work individually is related to practice and revision tasks – promoting increased time on-task as well as creating the circumstances for differentiated tasks.

- Dyads can be used in two types of learning: an expert/novice approach and a mutual coming together of equals. For dyads to be effective children have to be able to communicate effectively and also have mutual trust.

- Small groups of 4 to 8 pupils are the recommended size for the pursuit of co-operative and collaborative tasks, with these tasks involving enrichment and incremental learning.

- Whole class work provides a context for the wider transmission of knowledge; however, it is likely to act as a barrier to pupils' active engagement with learning.

- Across these scales of group work learning tasks must be set at an appropriate level to encourage group working. Tasks set at too low or too high of a cognitive level will discourage pupil participation.

- Breaking down a task into components such as planning, brain storming, forming consensus will facilitate group working; if the task is not broken down into such components, pupils may loose interest and direction.

Group working skills and composition

- For effective group working in any format children must establish positive relationships between group members that allow for sensitivity to others, trust of others and effective communication.

Group size, interaction and learning outcomes

- Learning processes related to cognitive development (either new knowledge or application of knowledge) will be enhanced by effective social communication and support. Reflectively, these cognitive-oriented processes will be inhibited if the pupils threaten one another and if pupils maintain an over-reliance on the presence and direction of the teacher. These enhanced processes that support learning should facilitate attainment in all types of classes.

Studies of pupil groupings in secondary schools

- Results from meta-analyses consistently show only limited academic gains in co-operative/collaborative classes compared to traditional classes, but pro-social and pro-school attitudes improve significantly in co-operative/collaborative classrooms and where relational and other training are integrated into the classroom (programmes such as SPRinG). These results contrast strongly with set (or ability-based) classes, where there is little attainment advantage associated with this type of grouping and actual attitude and behavioural disadvantages especially among the lowest attaining pupils.

- Results from training interventions with secondary pupils in Caribbean schools showed increased attainment and participation for all pupils, especially the initially identified low achievers.

- At least three characteristics underlie collaborative and co-operative intervention studies: 1) tasks must be selected that involve particular types of group intellectual interaction, 2) the composition of pupil groupings should promote social interaction,

and 3) teachers play a major role in the encouragement and training of pupil group work skills in these conditions.

- Naturalistic study of classroom social experience has described these as sites for social reproduction within which attitudes and behaviours are constructed in response to structural demands of schooling. Studies concerning pupil interaction and within-class grouping from this tradition have described processes of differentiation and polarisation by social class, attainment, race and gender.

Composition of within-class groups in secondary schools
- Reasons underlying pupil grouping tend to be dominated by classroom organisation rather than pedagogic purpose.

- Research also indicates that within-class pupil groupings in secondary classrooms are usually not constructed by teachers, rather pupils choose their own seating and the most consistent explanation for this seating (and grouping) was friendship.

The impact of the composition of groups
- Lower sets have a disproportionate number of boys, pupils from specific ethnic groups, pupils from lower social economic groups and pupils identified as having SEN, all of which affects expectations and aspirations.

Impact on attainment and progress
- There are no significant differences between setting and mixed ability teaching in overall attainment outcomes. Studies suggest little evidence that ability grouping across KS3 contributes to raising standards for all pupils; but at the extremes of attainment, low achieving pupils show more progress in mixed ability classes and high achieving pupils show more progress in set classes. Few of these studies consider the role of within-class grouping of pupils.

Impact on teacher and pupil attitudes
- The relationship between ability grouping of pupils and disaffection, in particular of pupils in the lowest groups, has been well demonstrated.

Impact on teaching and assessment
- Evidence suggests that if not planned, teacher attention may be disproportionately focused on higher attaining pupils in mixed ability groups.

- Higher sets are more likely to have experienced and highly qualified teachers and lower sets more changes of teacher, and teachers who are not subject specialists.

- Pupils in some mathematics sets are taught as if they were identical in ability, given the same tasks at the same pace. Pupils in lower mathematics sets report, and are observed to be, insufficiently challenged and expected to spend more time copying off the board than in higher sets.

Impact on pupils with specific characteristics

- The evidence is patchy on the impact of grouping strategies on pupils with specific characteristics. For pupils identified as gifted and talented, full time specialist programmes and constructing separate groups within a mixed class taught by someone specifically trained are effective in academic gains for these pupils, but the effects on the other pupils in the school remains unknown.

- Evidence on gender suggests that boys are over-represented in lower sets. There is evidence from one study that selective single-sex teaching in some subjects can benefit boys in English and modern languages and girls in science and mathematics, under particular conditions.

- Pupils from some minority ethnic groups and pupils with SEN are over-represented in lower sets. There is a dearth of research evidence on the effects of organisational grouping on either of these groups of pupils but there is some evidence of the potential benefits of flexible organisational grouping and within-class grouping that allows for the effective deployment of teaching assistants for pupils with SEN.

Impact in different subject areas

- There is very limited research on the differential effects in different subjects of either organisational or within-class grouping. However, one study shows that the stronger effects of setting in mathematics which limit the progress of lower attaining pupils while enhancing that of higher attainers, are not apparent in English or science.

- A limited number of within-class group work training studies have been undertaken, and show that communication, support and other skills can be integrated into various curricula and have positive effects on attainment in mathematics, science and English.

Key recommendations

- Ensuring that policy and guidance on practice that relates to grouping acknowledges the wide range of practices that exist, the need for organisational grouping to be flexible and to be evaluated, and for teachers and schools to be responsive to emerging effects.

- Encouraging more explicit planning and evaluation of within-class grouping, taking account of possible relationships between pupil characteristics, group size, group composition, task and social interaction.

- Emphasising the importance of teaching and supporting group work skills for pupils and teachers and of the potential role of teaching assistants in this process;

- Exploring through further research how knowledge and practices of both organisational and within-class grouping may be drawn upon to facilitate transfer from primary to secondary schools, in particular to acknowledge the potential impact of friendship, gender and focus on pedagogy.

- Other future priorities for research might include the comparison of the effects of organisational grouping in different subjects; the effects of organisational and within-class grouping on pupils from minority ethnic groups, those identified as having SEN or as gifted and talented; and the longer term effects of 'training' pupils and school staff in group work strategies.

Appendix 1:
Definitions of organisational grouping

The terms streaming, banding, setting and mixed ability teaching refer to pupil grouping across a year group or school.

Streaming refers to the practice in which pupils are assigned to classes on the basis of overall assessment of their general ability, usually based on prior attainment or outcomes of cognitive or other tests. Pupils remain in their streamed classes for the majority of subjects.

Banding refers to the practice in which pupils are assigned to broad bands across a year group on the basis of overall assessment of general ability. Pupils remain in the bands for the majority of subjects and it is therefore a less differentiated form of streaming.

Setting refers to the practice in which pupils are grouped according to their ability in a particular subject. This means that they may be in higher or lower sets and with different peers in each subject. In practice, many pupils tend to be in similar level sets across several subjects although for others the levels vary considerably.

Mixed-ability refers to the practice in which pupils are grouped to reflect the full range of abilities for that year group. The spread of ability depends upon the ability range that exists in the school.

Within-class grouping refers to the practice of grouping pupils within a class. They may be grouped for specific activities or most of the time, and may be grouped by ability or on the basis of other criteria (for instance to ensure a deliberate gender mix, or on the basis of a specific learning need).

Appendix 2:
Definitions of classroom learning tasks (from Norman, 1978)

Incremental: Introduces new ideas, procedures or skills or demands recognition or discrimination (also referred to as a cognitive task)

Restructuring: Demanding a child invents or discovers an idea for him/herself (a cognitive task)

Enrichment: Demands application or synthesis of familiar skills to a new problem (an application task)

Practice: Demands the tuning of new skills on familiar problems

Revision: Demands the use of skills that have not been used for some time

Appendix 3
Theories underlying group working in classrooms:
In England and Wales, the National Curriculum introduced in 1989 was accompanied by recommendations for using group work for particular curriculum purposes. Generally, the National Curriculum has been associated with decreased individual working, increased whole-class working and unchanged levels of working in small groups (Galton et al., 1999). Thus, while the proportion of individual work in the classroom may have decreased, pupils will spend most of their 'learning' time in the company of others – either in small groupings (formally structured as in dyads or informally structured when individual pupils are allowed to consult their peers) or the whole class. Moreover, it is not very common that teachers group their pupils on pedagogical grounds, planning and setting group work in the classroom with the purpose of enhancing children's learning, motivation and social skills.

The reality of classroom practice, however, shows that, in spite of all the knowledge on group work and on its effectiveness, the application of this educational strategy in the daily classroom process is still under-utilised; a practical awareness that exploits all the possible potentials and benefits of group work in the classroom is somehow lacking. Indeed, research has still to focus its aims on integrating group work into "authentic" class settings. What is still required, then, is the development of a new kind of social pedagogy, by which to understand and inform the use of groups in classrooms. In working with classroom groupings and group working materials available to teachers (and researchers) there are a number of different theoretical bases and approaches that underlie design and recommended usage. The predominant theories underlying the promotion of group working are psychological, derived from behavioural, developmental, social and humanistic psychology, and sociological, concerned with social justice and inclusion.

Psychological theory has tended to view and shape the functioning of the individual while the sociological has placed greater emphasis on the social context in which cooperation and group work may be promoted. Psychological and sociological theories are not mutually exclusive: there is much variation within each type of theory as well as common ground between theories. To exemplify these points:

1) Variation within psychological theory includes behaviourist theory (found in elements of cooperative learning from researchers such as Slavin 1990), psychodynamic theory (Lippett & White, 1943; Allport, 1954), cognitive and socio-cognitive theories (from Piaget, 1928; Vygotsky, 1978 and researchers working in these traditions) and newer theory based on social relational development (Kutnick & Manson, 1998). The psychological theories attempt to explain inter-personal and intra-personal mechanisms which enable individuals to work more productively as groups, and emphasise themes such as reinforcement (behaviourism), common goals and responsibility for the group (psychodynamic) and the importance of close/supportive relationships (social relational).

2) Sociological theory (Cohen, 1994) places an emphasis on the requirement that co-operative (learning) groups must overcome problems of status among pupils. In particular, Cohen noted that high status pupils (as defined by attainment, social class, race, gender, etc.) are likely to dominate group activities and that active efforts must be undertaken to ensure the heterogeneous pupil groups draw upon the multiple abilities of all members and that (previously identified) low status pupils are put in a position where their competencies can be drawn upon and praised for successful involvement (Cohen & Lotan, 1995).

Both psychological and sociological theories have practical implications for the use of group work in educational settings – although one fundamental contradiction should be noted. It is often perceived that effective group working requires some form of collaborative or co-ordinated activity among individuals. Approaches to classroom group work tend to focus mainly on actions that promote collaborative and co-operative learning

and, thus, add only partial insight into a social pedagogic understanding (as group working can be effective in other circumstances as well as co-operative and collaborative learning).

Psychological theories most strongly associated with pupil group working in classrooms have been dominated by behavioural, cognitive and relational theories. Psychodynamic theories also provide a range of techniques to develop and support the interaction of group (especially co-operative group) members. Psychological theories have been developed with two distinct outcomes in mind – learning/school achievement and social/pro-school attitudes. Only lately have reviews of group working in classrooms (especially with regard to co-operative learning) differentiated between these two outcomes when assessing the success of a grouping approach (see especially Gillies & Ashman, 2003).

1. Behavioural approaches: One of the psychological theories most in evidence when group working is referred to is behaviourism. From early studies of social learning (for example, Bandura & Walters, 1963), fairly simple explanations for the success or failure of co-operative learning have been related to processes of reinforcement – from gross extrinsic rewards provided upon successful completion of a task (associated with enhanced likelihood of repeating that task in a similar manner to the rewarded task) to more subtle forms of intrinsic reward. One key but often criticised element of Slavin's approach the 'teams-games-tournament' form of co-operative learning emphases provision of an overt reward for a successful completion of the (classroom) assigned task as well as relational planning based on contact theory (Allport, 1954). Contact theory is a set of principles detailing characteristics of a group task likely to promote co-operation among group members; characteristics include: joint outcome, individual responsibility for different aspects of the task (complementarity) and all group members being of equal status. If this high quality contact can be planned into a learning task, the likelihood of success is increased and rewards can be used to positive effect. Other group work aspects of a behaviourist approach have been found in social skills training and socio-behaviourism. Social skills training is founded on a non-problematic identification of 'normal' group behaviour (for classrooms or elsewhere), a breaking-down of this behaviour into component units and teaching/reinforcing of each unit for any pupil whose behaviour is deemed to lie outside classroom norms. There have been a number of effective social skills training programmes (see Ogilivy, 1994 for a review), but Ogilivy (1994) and Kutnick & Manson (1998) have criticised these programmes for their functional view of norms, and reliance on the individual as the focus of training which, in effect, decontextualises the learned behaviour from the social interaction (with classroom peers) where it is likely to develop naturalistically and interpersonally. A further criticism of behaviourist approaches to group working has focused on the use of rewards; researchers such as Damon (Damon & Phelps, 1989) state that the likelihood of effective group working will be limited if the sole focus is on external reward of overt behaviours – and not accounting for children's conceptualisation of interaction and joint problem solving. One may see the socio-behaviour theory and practical developments by Dodge and colleagues (Dodge, Pettit, McClaskey & Brown, 1986; Dodge & Coie, 1987; Dodge & Crick, 1990) as a response to the overt reward/lack of conceptualisation criticism. Dodge has accounted for social interaction within a behavioural context in the assessment of social skills and normal behaviour. This type of theoretical understanding acknowledges that pupils will bring their own background experience to co-operative actions. Dodge et al. (1986) posed a five stage process (from the co-operative stimulus to the child's enactment of a response) that could be affected by previous experience. Further, the types of (internal and external) reinforcement gained in these actions can then be seen to effect children's self-efficacy – which controls interpretation of the event and willingness to participate in similar future events.

2. Cognitive approaches: Cognitive and socio-cognitive theories underlying the encouragement of group working among pupils tend to focus on the role of talk among

children (and others) and are strongly associated with the enhancement of cognitive development among children. These theories are based on theories developed by Piaget and Vygotsky, but are seen mainly in applications by (what can be called) neo-Piagetians and neo-Vygotskians. Piaget (1928; 1932) and neo-Piagetians (for example, Doise and Mugny, 1984 Perret-Clermont, 1980; as well as Light & Littleton, 1994; Howe & Tolmie, 2003 and others) focused their studies on the exploration of mutual peer interaction during problem solving tasks; showing how "socio-cognitive conflict" can enhance the progress of individual cognitive achievements (reviewed by Damon & Phelps 1989). Cognitive problems assigned (usually) to equally naive pairs are likely to draw out individual perspectives from partners. As long as the partners are not influenced by an inequality in power (one dominant and one submissive partner), a clash between perspectives is likely to be resolved by adopting a joint perspective which is cognitively more complex than either of the partners was able to contribute originally.

Vygotsky (1978), by contrast, focused on the role of instruction (an asymmetrical interaction between two or more individuals where one of the partners has expert knowledge while the other does not). Theory of instruction has been further developed in accounts of 'appropriation' by Wertsch (1985). Key terms and statements derived from Vygotsky and colleagues have become commonly accepted jargon within the world of learning and classrooms: based on the process that children's understanding moves from the 'inter-personal' to the 'intra-personal' and within the 'zone of proximal development' (see Luria, 1976). Typically, the 'ZPD' is described in adult-child interactions and the growing competence of the child to process information (Tharp & Gallimore, 1988), although a number of researchers in the neo-Vygotskian tradition (for example, Mercer, 2000) have shown how children are also effective 'experts' when working with other children in the 'ZPD'. This theory offers an account of tutoring (see especially peer tutoring, Topping, 1994), and draws the attention to the fact that concepts of negotiation of meaning and co-construction of shared understanding can be applied to peer interaction as well as to child-adult interaction. There is further evidence in Vygotsky's writings (1966/91) that symmetrical (novice/novice) relationships between individuals can create a zone of proximal co-development (Kutnick, 2001).

The use of mutual (symmetrical relationships described predominantly by Piaget) or asymmetrical (expert/novice relationships described predominantly by Vygotsky) interactions to resolve cognitive problems are strongly correlated to the type of problem presented. Open-ended (brain-storming) problems are more likely to be resolved in symmetrical interaction while close-ended problems are more likely to be resolved in the asymmetrical interaction between a knower and a learner. Both of these approaches are reliant on the importance of talk in the active construction and co-construction of knowledge. Referring to the research of Donaldson (1978) and Garvey (1977) one could argue that learning is facilitated by collaborative group work precisely because of the talk which it elicits. Talk, though, should not be looked upon naively as something that is bound to happen when children are seated near one another – even if they are given a common task. In cognitive-based talk (explored by researchers such as Barnes, 1976, Mercer, 2000; Webb 1989) group members must move beyond simple description, confirmation or disagreement to 'elaborations' of the subject that add new cognitive perspectives and clarify existing information. Reid et al. (1989) suggest that the use of talk is a key reason for the use of group work particularly because it provides opportunities for exploratory/explanatory talk; an essential part of the learning process designed to facilitate higher order thinking (and tend to descriptive events in group working as Engagement; Exploration; Transformation; Presentation; Reflection).

Cognitive and socio-cognitive theories that inform pupil group working focus especially on the role of constructive discussion. Only rarely do these theories acknowledge the importance of the quality of the relationship between interactors. The relationship between

cognitive partners may facilitate or discourage interaction (Light & Littleton, 1994); a key issue identified in the earlier description of pupil groups in classrooms (Galton, 1990; Galton et al., 1999). In simple terms (as confirmed by Mercer, 2000), if individuals do not have a positive, supportive social relationship then they are unlikely to engage in elaborated discussion. Consideration of supportive relationships within cognitive theory has led some researchers to pair children (for cognitive discussions) by friendship (Hartup, 1998) and gender (Meill & MacDonald, 2000). Friendship and gender similarities have been identified as providing children with a relational history and similarity of perspective - although pairing of children by similar/homogeneous attainment may inhibit the quality of discussion among some children (Perret-Clermont, 1980; Webb, 1989; Kutnick & Kington, 2005).

3. Relational approaches: Drawing upon both cognitive and social development theories, two further (theory-based) approaches have been developed and adapted for classroom group working. These approaches have at their core the cognitive consideration that supportive relationships are fundamental to communication (and other) interactions; the approaches attempt to promote the development of social relations among children – which will provide a social pedagogic context of mutual support and communication (see Kutnick & Manson, 1998; Hall, 1994). In his description of this approach, Hall stresses the importance of using effective group work practice as a method to improve social relational and emotional development, focusing attention not only on the content of the group work activity, but also on the process and interpersonal sensitivity gained through typical procedures like Circle Time (Bliss et al., 1995; Curry & Bromfield, 1998). Kutnick & Manson (1998) contrast their social relational approach with social skills training (SST, in which emotional development strategies and communication skills are developed in behavioural sequences, described above, as a means of case-specific clinical intervention for children with perceived abnormal behavioural patterns). A social relational approach necessarily focuses upon the interpersonal (as opposed to individual) development and uses the whole class as an inclusive site for development of group work. This approach is modelled on the development of close relationships such as attachment, within which trust, dependence and responsibility (Ainsworth, Stayton & Bell, 1974) establish the bases for further relationships, social and cognitive development. Studies presented by Hall and by Kutnick and Manson show that a social relational approach for children has positive effects not only on their social capacities, but also on their (cognitive) learning and motivation to work with others. The social relational approach has been the basis for intervention in current long-term classroom research being undertaken by Blatchford et al., 2000).

4. Applying theories to the classroom: Some of the above theories have been developed purely for experimental situations, while others have been adapted and applied to situations where groups of individuals may meet and work together. Adaptations and applications of theory to inform and facilitate group working are predominantly social (including social psychology and sociology), and have been more strongly associated with relationships rather than learning. Two main approaches to enhancing group working are developmental group dynamics theories and theories drawn from co-operative group work research. The former approach places great emphasis on the process of the group becoming a productive working unit, whilst the latter focuses on specific features of the group which engender positive outcomes for individual group members.

Both approaches are based on an understanding that effective group working is unlikely to 'happen' simply because a number of individuals work in close proximity to one another or share a common goal. These approaches have designed and developed a range of materials that acknowledges a developmental sequence of activities is likely to enhance group working and its outcomes (similar to the sequence found in social relational theory). Materials likely to enhance group working often refer specifically to Tuckman's (1965) stages of group development: forming; storming; norming; and performing. These stages

describe how the group has to pass through initial stages that move from individual identity to group identity, realisation of group needs and support (for cohesion) that enable members to work productively (the ultimate aim of the training materials). This approach focuses on the small group as the site for learning and development and acknowledges that any group is formed from individuals with distinct backgrounds/identities that must create shared norms to enhance to likelihood of achievement. Further, stages that build towards effective group working require some form of training programme to facilitate progression through the stages. The active learning of group work skills is a central feature of the developmental group dynamics materials. Exemplar material by Kingsley-Mills et al. (1992) and Thacker et al. (1992) refer to the Experiential Learning Cycle (Pfeiffer & Jones, 1983). For the effective learning of relevant skills and knowledge, this cycle specifies that each group activity needs to incorporate the following stages: experiencing; publishing (sharing reactions and observations); processing (discussion of patterns and dynamics); generalising and applying (planning more effective behaviour). While apparently similar to Tuckman's stages, Pfeiffer & Jones place great emphasis on group members adopting their behaviour to allow for the success of group; noting the interactional quality of group work as it develops. It should also be regarded as central in any scheme of group work training that teachers as well as children require training. Thus, in an action research oriented study undertaken in the Caribbean (Kutnick et al., in preparation), a social relational approach to group working was initiated over a period of two terms. Results of the study showed improvement in attainment and motivation for pupils, and teachers' perceptions of effective pupils changed from having good general knowledge and paying attention in class to good general knowledge, able to work well in a group and able to for positive relationships with classroom peers.

5. Theory as explanation for effects of group working: The above approaches have been introduced separately, yet there is a strong likelihood that aspects of some approaches overlap with other approaches. Studies exploring all methods of group work highlight the extended benefits of involving children in these approaches. Cowie (1994) identifies three main perspectives, which she called "strands", which facilitate the development of group work:

- The focus in the first strand is the part the group plays in fostering the personal growth of the individual. Indeed, co-operating in a group encourages the sharing of ideas and experiences in a friendly atmosphere. Group work develops a sense of identity in a setting where conflicts can be worked through in a safe environment.
- The second strand is concerned with the development of cognitive capacity of the child. As Bruner (1986) and Vygotsky (1978) stress, there is a strong link between thinking and social process. Dunne & Bennett (1990) and Bennett, Rodheiser & Stevahn. (1991) explore ways in which social processes influence children's performance on specific types of tasks. They highlight the importance of the social context for learning and, with communication as a central feature of their model, point to the role of task-related talk in enhancing the children's capacity to learn. Current efforts are being undertaken (Blatchford et al., 2000) to establish the extent to which academic performance can be enhanced through relational training for group working.
- The third strand that Cowie identifies is a social or even a political dimension. Referring to the studies of Masheder (1989) and Pike & Selby (1988), Cowie stresses that group work plays a key role in helping children to become responsible thinkers with not only developing a positive sense of self and reducing the incidence of bullying in classrooms, but also a concern for global issues and perspectives (Cowie, 1994).

Appendix 4

Materials produced on group work by the Primary National Strategy and the Key Stage 3 National Strategy (since April 2005 the Secondary National Strategy)

Materials produced related to group work by the Primary National Strategy
- 'Speaking, Listening, Learning – working with children in Key Stages 1 and 2 (DfES/QCA, 2003 DfES 0623- 2003 G)
  Key strand 'group interaction'

- 'Excellence and Enjoyment, Learning and Teaching in the Primary Years' (DfES, 2004 DfES 0518-2004 G)
  Case study and CPD materials: Assessment for Learning, Creating the learning culture, Classroom community,collaborative and personalised learning , Learning to learn: progression in key aspects of learning, Key aspects of learning across the curriculum.
  'Classroom community, collaborative and personalised learning' unit Part 2 focuses specifically on 'learning in a group'
- 'Social and Emotional Aspects of Learning' (SEAL) DfES
  Silver set specifically focuses on activities to develop group working

Guided Work (adult supported)
Materials on guided reading produced in collaboration with the Reading Recovery Network, London Institute of Education:

Bickler, Baker and Hobsbaum (2003) Book Bands for Guided Reading , Bridging Bands for Guided Reading (2003)
Hobsbaum, Gamble and Reedy (2002) Guiding reading, a handbook for teaching guided reading at Key Stage 2

Materials produced related to group work by the Key Stage 3 National Strategy Group work

- Unit 12 'Thinking Together' in 'Training Materials for the Foundation Subjects (DfES 0350/2002)
- Unit 7 ' The management of group talk' in Literacy Across the Curriculum training folder (DfEE 0235/2001) - followed up by subject specific examples and guidance in a series of CD Roms for school-based use or self-study: 'Literacy Across the Curriculum' (DfES 0263/2004G)
- Unit 10 'Group work' in 'Pedagogy and Practice: Teaching and Learning in Secondary Schools
- Science: Using group talk and argument (DfES 069/2004)

Guided Work

- Guided Reading in English at Key Stage 3 (DfES 0044/2002)
- Training materials on guided reading and writing in English Department training 2002/03 for year 7 (DfES 0204/2002), year 8 (DfES 0303/2002) and year 9 (DfES 0201/2002), and on 'Improving Writing (DfES 0400/2003)
- Unit 9: Guided work' in 'Pedagogy and Practice: Teaching and Learning in Secondary Schools

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