Improving the Effectiveness of Pupil Groups in Classrooms

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Research Report

Background

In all British classrooms, pupils are grouped in some form. The benefits or disadvantages of these various grouping practices have aroused much comment by the UK government (OfSTED, 1995; DfEE, 1997; DfES, 2004) and among researchers (Blatchford *et al*, 2003; Lou *et al*, 1996).

Different grouping arrangements can affect pupils' learning, attitudes and interactions with teachers and peers in various ways. A central justification for this study was that both debate and policy on grouping in this country lacked a sound empirical UK research base. Much previous research has been dominated by particular theoretical approaches, many of them emanating from developmental and social psychological traditions (Allport, 1954; Deutsch, 1949; Piaget, 1928; Vygotsky, 1978). These approaches have underlined the importance of interaction between social, affective and cognitive states in development, and provided a rationale for the use of groupings in instructional settings. An alternative theoretical framework situates learning and development within ecologically meaningful environmental contexts, arguing that within the 'microsystems' of a school, there will be sub-systems at the classroom level that have qualitatively distinct sets of relationships, rules and dynamics which can promote or hinder learning and social development (Baines *et al*, 2003; Pellegrini & Blatchford, 2000).

Experimental research on the effectiveness of within-class groupings has demonstrated positive, albeit modest effects on pupil achievement, attitudes to schooling and social climate within classrooms (Kulik & Kulik, 1992; Lou, *et al.*1996; Slavin, 1990). The design of these studies, however, has not always reflected the 'authentic' settings within typical UK classrooms (Galton, *et al.* 1999; Kutnick et al. 2002) where a range of learning tasks may be undertaken simultaneously within different grouping arrangements.

Accounts of the use of groups in classrooms in the UK (Galton et al. 1999; Kutnick et al, in press), demonstrate that the effective use of pupil grouping in primary and secondary schools is a 'neglected art' and is viewed by many teachers as problematic. Our concerns for the current use of groupings within classrooms stems from Galton et al. (1980), who showed that within the majority of primary classrooms children sit **in** groups but rarely interact and work **as** groups. Instead, pupils work individually or as a whole class, often being drawn off-task by social talk while finding themselves in an environment that does not support productive group working. Other research has shown that both teachers and pupils have difficulties implementing peer and interactive group-work in classrooms (Bennett & Dunne, 1992; Cowie *et al*, 1994). Further, while various pupil groupings have been found in classrooms, these groupings (by size, composition, etc.) rarely supported types of learning task assigned, and teachers and pupils rarely received training that would facilitate effective group-working skills (Kutnick *et al*, 2002; Kutnick *et al*, in press).

Objectives

The main impetus for the SPRinG (Social Pedagogic Research into Group work) project was to build on our earlier research and address the wide gap between the potential of group-work to influence learning, classroom behaviour and attitudes to learning, on the one hand, and the limited use of group-work in schools, on the other. Overcoming this gap suggested to us that a new approach to conceptualising group-work in classrooms was needed to fully integrate group-work into the fabric of the school day, and provide a more sustained use of group-work beyond the life of the actual research. We therefore embarked on an ambitious project which sought to develop with teachers a programme of group-work that could be successfully integrated into school life. This programme would then be systematically evaluated by examining pupil progress over a full school year and in comparison to a control group in terms of (a) attainment, (b) motivation for group working, and (c) within-group interactions. The training involved a relational programme designed

to develop support, communication and joint problem-solving skills among pupils (see Handbook appended).

The research aimed to:
1. Enhance the achievement and motivation of pupils when working in classroom groups by actively involving teachers in a programme designed to raise task related levels of group work, higher order cognitive exchanges and concentration on task, during typical classroom activity.
2. Evaluate the effect of (a) training pupils in group-work skills (b) varying group size and (c) different task demands on the level, type and quality of group-interaction,
3. Provide a high standard of evidence on which to base future practice by comparing under controlled conditions the relative effectiveness of group-work in typical classroom settings in terms of pupil attainment, motivation and attitudes.
4. Develop a social pedagogy of groups providing a solid evidence base for the use of group-work in the curriculum by examining its generalisability across different Key Stages, learning contexts and for specific purposes.
5. Disseminate results and recommendations on effective group-work skills to academic, practice and policy based audiences.

The main research questions were as follows:
1. What classroom management and training strategies facilitate greater levels of peer and interactive group-work at different Key Stages?
2. What effect do training procedures, group size and task settings have on the level and quality of interaction in classes and what combinations lead to effective interactions and pupil concentration?
3. How effective is the peer and interactive group-work initiative at raising pupil attainment, and enhancing pupil motivation and attitudes, and contribution to groups, in relation to two control groups?
4. To what extent do these benefits persist over time and generalise to different contexts and pupils and across age groups?

The study had five phases. Following an **Introductory** Phase (Phase 1), there was a **Developmental** Phase (Phase 2), which involved working closely with teachers in seeking to develop the most effective methods of implementing group-work and included development of the programme and research tools for evaluation. The **Main Evaluation** Phase 3 was designed to test how well the group-work initiative works by experimental comparison, and longitudinal follow-up of children. An **Applications** phase (Phase 4) examined how a whole school approach to group-work can be developed, aspects of group-work involving children with particular needs and how group-work can be used in schools in 'difficult' circumstances. A **Dissemination** phase (Phase 5) was designed to be the last stage of the project.

This was a large scale project that extended for four years, covered three sites, and had five phases. The team have gone a long way to meet the research objectives and answer the research aims. It has resulted in a lot of information relating to the development of the programme, and its evaluation, application, impact and dissemination. The research team are involved in a large number of publications, presentations and other forms of dissemination (see Section 2A). In order to adequately describe progress and results, and after communications with the TLRP Director and the ESRC, we have decided to increase the word length to 7500. However, given the word limit, we only provide here selected background and results on each Phase in the research, and have deliberately avoided coverage of previous research and theory, and the use of a lot of references (see Section 2A).

Phases 1 and 2

The Introductory Phase was designed to recruit teacher groups for involvement in the study, construct resource packs and work with the teacher groups on implementing group-work and training pupils in skills involved in group work, set up a project web-site, start work on observation methods and other research tools, and set up an Advisory Group. It ran into Phase 2 which was a year long collaboration between the research team and teachers to develop a set of key implications from research and to convert these into usable practices that promote effective group-work in everyday classroom settings. Regular meetings with 10-20 teachers per Key Stage (KS) discussed emerging principles concerning effective group work, the construction, trialling and evaluation of activities by teachers, pupils and the research team, and there were visits to classes to observe and give feedback on group work and activities. Valuable lessons were learned about, for example, group size, group composition, what activities worked well and what strategies needed to be adopted to encourage good working habits in groups at each of the key stages. The resulting programme was set out in a 'handbook' for teachers, used in the subsequent evaluation. The Handbooks (KS2 version appended) varied between each site but all offer teachers principles and recommended practices.

As a result of Phase 2 the team developed an approach to group-work built on three key principles (see Blatchford, Kutnick, Baines & Galton, 2003 attached for further details).

1. A relational approach
Group-work skills have to be developed: we cannot just put children into groups and expect them to work well as a group. Group-work is therefore unlikely to be successful without a lot of hard work and preparation, and this will need to extend over the course of a school year. It is well known (see Gillies, 2003) that pupils need to have the skills to communicate effectively through listening, explaining and sharing ideas. But effective group-work involves more than this; pupils have to learn to trust and respect each other (Galton, 1990; Kutnick, 1988), and they need skills in how to plan, organise and evaluate their group work.

The SPRinG project organises activities around a developmental sequence. It begins with an emphasis on social skills (particularly social support and trust), followed by communication skills, leading to more advanced group-working skills, and finally integration of these skills into the curriculum. A key aim is the development of pupil independence. This is made difficult because there is a common assumption, at primary school level at least, that children are not able to work together independent of the teacher. But one message that has emerged is that it is important not to allow conflict in groups, or gender and ethnic differences, to dictate the success or failure of groups. If not addressed then difficulties between pupils may lie below the surface and inhibit classroom learning.

2. Involvement of teachers in the design of the project and in group work
Teachers as well as pupils have difficulties and concerns with group work. Programmes developed in one context may not readily transfer to others. They will need to allow teachers freedom to adapt grouping strategies for different purposes and tasks. Galton and Williamson's (1992) study suggests teachers in the UK need 'ownership' of the approach in order to develop skills of group work.

At the heart of the SPRinG approach, therefore, was the need for strategies with teachers likely to lead to high quality and thoughtful group work. We have co-developed several ways of conceiving how teachers can make group-work productive. One way is by lowering the risk for pupils, while ensuring the challenge remains high, through a process of 'scaffolding'. Scaffolding, when it comes to supporting group work, will involve adapting and structuring the group-work context and the task (see Palincsar and Herrenkohl, 1999; Tolmie et al., 2005). It may also be helpful to think of the teacher as a *guide on the side, not a sage on the stage.* It is important for the teacher to find time for observation of pupils, and for her to spend time monitoring their behaviour.

3. *Creating the classroom context for group work*
Our approach rests on the view that group-work has to be considered in the wider context of the whole classroom. This will include three main dimensions: a. 'fixed' factors such as classroom and class size and seating arrangements in the classroom; b. characteristics of groups such as their size, number, composition and stability over time; and c. group-work tasks and activities, and the curriculum. The teacher has a key role in organising these in a strategic way in service of effective group-work (see Blatchford et al., 2003 attached, and papers in preparation, for further information).

The Handbooks give expression to these principles through two main sections, one on *Principles* and one on *Group-working activities and lesson plans*.

Findings from Phase 2 of the research exceeded our expectations in that they provided a far greater range of useful and effective practices than originally anticipated. Teachers felt that training was very successful and were particularly positive about the SPRinG training activities/lessons. Teacher reports and researchers' field notes suggested that quantitative comparisons of group size and task type, as in the proposal, would be too simplistic to capture information of use to practitioners. Results suggested that group sizes used should relate to the age and experience of the pupils and the complexity of the task. At KS1 teachers were encouraged to use groupings of pairs of children working together, and at KS2 pairs to fours and KS3 fours to sixes depending on the task.

Teacher involvement
It seemed to us that the success of the SPRinG project depended on developing strategies for teacher involvement and professional development likely to lead to high quality, thoughtful, and sustained implementation. There were many spontaneous accounts from teachers of how pupils had improved and their own professional skills and confidence enhanced.

Teachers consistently commented on how useful the Handbooks were, and how helpful they found the advice and activities. They profited from the guidance we were able to offer them, and from the hard-won experiences of other teachers. It was quite clear that they would not have found acceptable a research manual that had not been tested and nurtured in classroom contexts and which did not relate to their immediate curricular and behavioural concerns. Sometimes the advice went against their better judgements, e.g., persisting with groups when members clashed, and teachers would not have been willing to have accepted our advice if the programme did not have credibility in their eyes. Moreover, the Handbook was never designed to be the final word on the topic – rather it was deliberately open-ended and expandable. This meant that teachers were constantly involved in the text as participants.

We saw examples of how teachers' teaching repertoire was extended, and saw them developing their own alternatives to enhance recommendations and offering their thoughtful and insightful evaluations of the effect of the group-work training on pupil-pupil interaction and support. There were unexpected benefits: as pupils demonstrated group-working skills, teachers reported that they had been 'freed' from many of their ordinary procedural duties and they were now able to reflect on, and think strategically about, their teaching.

Phase 3 Method
The main aim of Phase 3 was to test the effectiveness of SPRinG by comparing pupils trained on the SPRinG programme with pupils who were not. The main research question was whether the group-work programme led to increases in learning/attainment, more 'favourable' motivational patterns and attitudes to learning, and behavioural and dialogue patterns supportive of learning.

The exact designs, as well as samples and measures, varied somewhat between sites but at all sites the group training programme extended over time and pupils were assessed in terms of the three outcomes of: attainment/learning, motivation/ attitudes, and classroom behaviour (see Appendix 2 for details of research and intervention timetables, samples and a summary of the measures used at each KS).

Academic/ learning measures covered both 'macro' and 'micro' measures. These necessarily varied between sites, and a fuller description is provided in Appendix 2.

Motivational/attitudinal measures at each KS came from pupil self completed questionnaires involving rated items which, when added, formed a number of scales at their most complete at KS3 (see Appendix 2).

Classroom behaviour measures at each KS came from on-the-spot systematic time sample observations of pupil behaviour and interactions when with other children, the teacher and when working alone. The schedule (see Appendix 2) was based on those used in previous research by the directors and develops and refines further the use of systematic observation for descriptive and evaluation purposes in educational research. At KS1 and KS2 videotapes were also made of group-work in experimental and control classes to allow more fine grained analyses of classroom discourse and group processes.

Classroom Rating Scale
To investigate the extent to which teachers continued to implement the principles set out in the training programme throughout the year a rating scale (see Appendix 2) was constructed for KS3 classrooms, covering the effectiveness of briefing and debriefing, the appropriateness of the tasks, and the relationship between the teacher and the class and between the pupils.

Phase 3 Results
In the interests of space only selected results will be presented. A considerable number of analyses have been conducted at each site and other analyses are ongoing. All results from statistical analyses and tables are shown in Appendix 3.

Summary of results
- Despite teachers' concerns that group-work might get in the way of coverage of mainstream curriculum areas there was evidence that involvement in SPRinG had positive effects on pupils' academic progress. At KS1 benefits were seen in reading and mathematics. At KS2 group-work seemed to benefit all types of knowledge in science but especially problem solving and inferential thinking. At KS3 the success of group-work depended on the type of topic, but appeared to benefit higher cognitive levels.
- Involvement in SPRinG led to more, and better quality, involvement in group work, and less individual work, more on task interactions in groups, and interactions were more likely to be sustained and substantial, and contributions high level, in comparison to control groups.
- In line with programme aims, SPRinG teachers were more likely to monitor interactions between pupils and less likely to engage in direct teaching. Pupils in SPRinG classes engaged in more autonomous learning in groups.
- Especially at KS2, involvement in SPRinG reduced differences between boys and girls and pupils of different attainment levels in contributions to group work.
- Results on pupil attitudes and motivation to group-work were less clear cut, though there was a suggestion that involvement in SPRinG seemed to arrest deterioration in attitudes to group-work and school subjects. At KS1, pupils showed developing preferences for paired and small group-work over individual work. Further analyses, especially at KS3, is proving to be insightful in

showing ways that attitudes to group-work can vary in a systematic way between different groups of pupils.

1. *Attainment and Learning*
KS1
Performance In Primary Schools (PIPS) test scores were collected in reading and mathematics (see Appendix 3, Table 4). In Year 1, post-test reading scores for SPRinG classes were higher than control, especially noteworthy given that SPRinG classes took pre-tests later than control classes. In Year 2, post-test reading scores improved in SPRinG classes more than control. Mathematics scores for SPRinG classes were initially lower than control classes at the pre-test and significantly higher on the post-test and greatest improvement was found in lower attaining children. In the control classes, mid attaining children improved the most.

KS2

SPRinG pupils showed more progress over the school year than the control group on the overall 'macro' science tests, the two 'macro' sub-tests covering the areas of evaporation/condensation and forces, and also more progress between pre and post 'micro' tests before and after specific lessons covering evaporation/condensation (see Table 7). Effect sizes are moderate to high. We also found additional progress over the micro science lessons in evaporation to the end of year macro test suggesting that knowledge and ideas resulting from the intervention may actually further strengthen. Results suggest that the SPRinG group-work programme is helpful for all areas of scientific knowledge and understanding. However, the assessments, particularly in the micro evaluation tests, tended to be weighted more toward higher order, problem solving, suggesting that group-work can have particular benefits for inferential and analytical knowledge.

KS3: Attainment (group v whole class teaching)
The main focus of Phase 3 of the research was to compare the effectiveness of group-work compared to whole class instruction.

English Results
Only for imaginative writing (Table 14) was there a significant difference in the case of group-work alone. In discursive writing both group and whole class work record significant gains but the size effect is nearly twice that for groups compared to class. Both boys and girls do better when working in groups (Table 15) but girls do so to a much greater degree. Furthermore, (not shown in the table) it is the less able boys who do better in groups than their more able peers.

Mathematics Results
Differences between group-work and non-group-work were highly dependent on topic. For area/volume and ratio the difference in residual gain (group v non group) was –0.40 and –0.21 respectively. For number patterns and interpreting data the trend was reversed (+0.90 and +0.20). The test items assessing number patterns and interpretation of data generally required higher order cognitive skills in formulating correct answers. Scores on these topics were therefore combined in subsequent analysis. Table 16 shows this analysis broken down by gender. Scores are in NFER points equivalent of National Curriculum levels.

Table 16 shows results for tasks requiring higher cognitive skills, working either in groups or as a whole class results in significant gains but the effect sizes are much larger for group work. This is true for both boys and girls. For lower level tasks, however boys do better in groups while girls make bigger gains when taught as a class.

Science Results
The results for the different topics have not been combined in Table 17. Numbers in some cells were too small to investigate gender differences. For electricity all pupils improved significantly (large effect sizes >1). For forces the effect size is large (1.37) when using groups and relatively small (0.40) when adopting a whole class approach. When teaching particles significant gains (medium effect size; s= 0.66) only occur when groups are used.

A complex story is beginning to emerge but the evidence so far offers support for the increased use of group-work at KS3, particularly when the tasks are of a high cognitive level.

Classroom behaviour
KS1
Systematic observations
a. Work setting over time (Appendix 3, Table 5): SPRinG classes decreased individual and whole class settings and dramatically increased group work. Control classes maintained individual, whole class settings. SPRinG classes undertook more core curriculum subjects in a group-work setting; especially mathematics and science.
b. Within individual tasks, SPRinG and Control classes demonstrated high levels of on-task' behaviour (70%+).
c. Teachers were most involved with Control classes while SPRinG children worked more autonomously.
d. Activity with peers: SPRinG classes showed more 'on task' and 'task preparation' behaviours. Control classes showed more 'procedure/routine'. SPRinG children increased sustained interaction with group members while control children decreased interaction and were likely to focus on children outside their groups.
e. Peer-based talk: In instances of high level talk, SPRinG classes dominated (97% v 3%).

Video analysis
Analysis of video tapes of micro testing focused on pairs of children designing concept maps, and were analysed with Fogel's relational coding system (Table 6) SPRinG pupils increased in terms of on-task conversation, co-regulated speech and task engagement, while control pupils decreased. On the other hand, control pupils increased unilateral speech/disruption, while SPRinG pupils decreased.

KS2
Systematic observations
Multi-level logistic regression analyses show clear differences between the SPRinG and control pupils on the key observation measures and their behaviour changed in predicted ways over the school year (see Tables 8-10).

*   SPRinG pupils spent more than twice as much time in group work, and this tended to increase over the school year at the expense of individual work.
*   Interactions between pupils were more on task in SPRinG classrooms. These increased between the first two time points. Conversely, control pupils spent more time in off task interactions.
*   SPRinG pupils' interactions were far more likely to be high level and this increased after the first term.
*   SPRinG pupils engaged in more sustained interactions (and increasingly over the year) and made more substantial contributions, while control children's interactions were more commonly coded as intermittent.
*   SPRinG teachers were more likely to monitor interactions
*   The SPRinG programme affected all ability levels and year groups equally

- SPRinG reduced differences between boys and girls (evident in control) with boys equally likely to make substantial contributions to group-work in the SPRinG sample.
- School levels of Free School Meals, Special Educational Needs and English as an Additional Language had few effects on behavioural outcomes.

Video analyses

Video data showed effects in favour of SPRinG groups (see Tables 11-12):

- Pupils in SPRinG groups were more likely to be fully involved in the group, whereas in control groups there was a tendency for only some pupils to be involved.
- Higher levels of high level inferential talk were found in SPRinG group-work interactions than those of control groups.

KS3

So far the analysis of the observation data has examined the changes taking place following training and looked at major differences in the conversation categories during group and whole class lessons. To aid interpretation of the observation data we found it necessary to supplement our classroom visits with a classroom rating scale described above. Among the main findings associated with training were the following:

- Pupil-pupil interaction increased with training reaching a maximum in the 2003 spring term but declining during the summer. We attribute the decline to delaying observations until after examinations when teachers said students were 'demob happy'.
- In 2003-04 briefing and teacher-pupil relationship ratings increased significantly throughout the year. Debriefing ratings increased only for teachers who were repeating the training programme.

Group Size, composition and task demands

This was monitored through observation and teacher feedback.

- Group size varied from 2 to 6 pupils. No significant differences were observed in the levels or type of pupil-pupil interaction.
- Classes were generally set. Lower sets found working in groups more difficult. Higher order pupil-pupil interaction (suggesting, questioning, and explaining) was facilitated in mixed ability groups (even within sets). Most teachers dealt with reluctant participants by starting off with pairs (often friendship) and the combining pairs into groups of 4 or 6. Higher order interactions were facilitated by *collaborative* (single shared task and outcome) rather than by *cooperative* (individual tasks but shared outcome) groups. Mixed gender groups appeared more effective.

Class versus Group Interaction

- In groups the levels of sustained interaction concerning raising questions, making suggestions and justifying statements with reasons (open dialogue) is higher during group discussions in both English and mathematics but not science. These differences increase as the year progresses. Furthermore, these interactions are more often sustained in group situations.

Attitudes and Motivation

KS1

a. In Year 1, 'personality' questions showed higher scores for SPRinG classes but only 'I like to be in a group' was significant. SPRinG pupils expressed preference for group and paired work especially with regard to 'works hardest', 'learns most' and 'thinks best' while control pupils expressed individual preferences.
b. In Year 2, SPRinG children were more concerned about classmates, productive class-working and 'group liking' than control pupils. 'Group working' measures showed two differences for

individual items; SPRinG pupils acknowledged 'greatest help' from pairs and groups and 'best thinking' in pairs while control pupils focused on the individual for help and thinking.

KS2
Findings indicate few effects of SPRinG over control KS2 pupils on the following attitudinal dimensions:
- The value of group work
- Liking group work
- Peer relations activator and truculent
- Subject attitudes of English and Maths

However the following effects were found (see Table 13):
- Over the year there was a significant deterioration in attitudes toward '*Working well as a group*' in the control sample only. SPRinG seems to have arrested such a deterioration among SPRinG pupils.
- Over the year attitudes to subject areas show the typical fall-off (see Galton *et al.*, 2004) with the exception of the SPRinG sample in science where attitude scores remain steady.
- There was a significant gain in 'mastery motivation' for the SPRinG sample from a level much lower than the control sample to a level that was consistent with this sample.

Current analyses are focusing on attitude data as explanatory variables and on the effects of SPRinG on different 'types' of pupils as identified at the start of the year.

KS3
Subject attitudes need to be viewed against recent research showing a steady decline in enjoyment of school and dips in liking for English mathematics and science. (Galton *et al.*2004). Where pupils rated group-work as effective, attitudes improved in English (for boys more than girls) and the declined in mathematics and science at a slower rate than previously.

Attitudes to group-working varied both by ability, gender and by age. Thus:

- Liking group-work increased during the year (Year 7 more than Y9). Girls increased their liking for group-work as did less able boys.
- Attitudes to cooperative working were high at pre-test (typically 81% of maximum possible rating) and remained unchanged. Year 7 pupils had the most positive attitudes.
- Pupils judged they worked less well in their groups (*not taking turns, cutting each other off, arguing*) as the year progressed. Boys' ratings tended to deteriorate more than girls. In science, where the decline in ratings was greatest, able boys expressed most dissatisfaction. Groups appeared to work best in Year 7.

When the scores on the various attitude and personality measures (see Appendix 2) underwent cluster analysis four distinct pupil profiles emerged (see Appendix 3 for details). This analysis is continuing. In some classes the proportion of anti-learning/anti-school pupils (types 1 and 3) is over 60% making it very difficult to teach. We have identified six classes where the proportion of such pupils is significantly reduced over the course of the year and are re-examining our classroom data and classroom environment measures to look for additional explanations for this success.

Phase 4
The purpose of this stage was to apply group-work to contexts which are known to be problematic. As said in the proposal this phase was meant to be more responsive, and decisions on areas for investigation would be taken after consultation with partner teachers and ideas from the TLR

programme. We focused on several key themes that emerged from earlier phases. Quantitative (especially for the longitudinal sample) and qualitative data were collected over the course of a year. Qualitative data included facilitator, teacher and pupil interviews as well as research and case study notes. Data from Phase 4 are proving insightful concerning processes involved in developing, applying and strengthening the use of group-work in schools. They are being written up and included in forthcoming books and papers (see Section 2).

Whole school approaches – At the two primary level sites it became clear that we needed to address how schools could begin to implement the SPRinG programme across the whole school. While Phase 3 demonstrated the effectiveness of group-work on pupils when the SPRinG team worked directly with teachers, there was no guarantee of success when schools must take on and develop the initiative themselves in their own schools. Moreover, it was our experience that some teachers did not implement group-work in as full a way as other teachers (we called this 'SPRinG-lite'), and this seemed to be more likely when they were working on an individual basis in their schools, not supported by colleagues. A main emphasis in primary schools (i.e., KS1 and 2) was therefore on developing and sustaining whole school approaches to group work. This was considered crucial for the wider impact and sustainability of the research. In Phase 4 we documented through interviews with staff and pupils processes that appear successful in developing a whole school approach.

Inclusion - Special Education Needs broadly conceived (e.g. children with language difficulties, emotional and behavioural difficulties, those of low ability and pupils from mobile populations) is a problematic area for teachers and schools in terms of inclusion and integration into classroom activities. This may be particularly difficult when it comes to peer and interactive group work. Furthermore, schools with high levels of poverty, EAL and mobile populations can be seen as particularly problematic as they frequently withdraw from such initiatives and try to emphasise the basics of individual work and whole class teaching. One team worked with teachers to explore ways of adapting the group-work programme to facilitate inclusion of children with special educational needs and another focused on the sustainability of SPRinG in schools in difficult circumstances.

Longitudinal analyses– Data have been collected on SPRinG pupils over time, since the start of Phase 3. Though these are yet to be analysed fully findings so far show continuity in SPRinG effects, for example, at KS1 classes involved in SPRinG training were (PIPS) tested in the following year and children progressed in reading and mathematics.

Activities and Outputs

See Section 2A

Impacts
In section 2, we listed a number of ways in which the project was being disseminated and having impact on professional, user and academic audiences. Here we concentrate on selected impacts with user groups.

At Brighton over 40 schools have applied for training in the use of group-work as part of the Working with Others (WWO) programme. Cambridge and London plan a series of conferences and workshops for local teachers and further newsletters which will be distributed nationally to all LEAs and schools. All three areas plan to issue manuals to help interested teachers develop group-working skills. At KS1 and 2 (and Scottish SPRinG) manuals are being integrated into one overriding manual for primary schools. Cambridge intends to bid for further TLRP funding to make a video setting out the key results at KS 3 based on the practice of the six most successful teachers in the study.

Elsewhere, work with teachers forms part of a project in Hong Kong which attempts to introduce group-work into reduced size classes (from 40 to 20). Professor Galton acts as consultant to this project funded by the Special Autonomous Region of China's Department of Education, Manpower and Planning. He has presented several workshops based on the research. In addition, Professor Blatchford has also recently visited Hong Kong and made further presentations to participating teachers, government advisers and officials from the Department of Education.

Impact in terms of research has led to the adoption of a considerable number of the project's methods (particularly the systematic observation techniques and the attitude inventories) by the Scottish Spring Project. The same instruments are also being used in the reduced class study in Hong Kong and further use is planned in a proposed study in Tasmania to be conducted by Professor John Williamson, Professor Galton's collaborator in an earlier study of group-work (Galton and Williamson 1986). Additionally, plans are being made to extend Professor Kutnick's initial Caribbean study for primary and secondary schools, focusing on inclusion, participation and attainment.

The Spring Project is also seeking to make an impact on policy, having been awarded a contract (along with Professor Judy Sebba of Sussex University) by the DfES to conduct a review of current research on grouping both as a part of school organisation and as a strategy to promote learning and social cohesion inside the classroom. The project, led by Professor Kutnick, will conduct a number of case studies and is expected to make recommendations by the end of the current year.

Future Research Priorities

The SPRinG project has resulted in a rich data set. We have answered key research questions but further analyses will be carried out. The results obtained so far suggest that the use of group-work in the classroom, while offering a valuable tool for teaching, needs to be used selectively in that it can have varying effects on pupils of different abilities, genders and attitudes in relation to different subjects, tasks and age groups. Our first priority will be to tease out some of these more subtle relationships in order to be more precise in our recommendations to policy makers and practitioners.

Another research aim will be to identify the 'key' aspects of the programme that lead to effective group-work in schools. The SPRinG programme was deliberately designed as a total package, but one key question that remains unanswered relates to whether it is the training in social, communication, and advanced group-work skills that leads to effective and successful group-work or some of the key principled and practical strategies suggested by the programme. Furthermore there may be particular aspects that are more successful then others. Following up this research programme with more focused research will be of benefit to schools and teachers since working with the SPRinG programme requires an extensive commitment and is certainly not a quick fix that is undertaken lightly. While we would not want researchers and schools to identify quick fixes, schools have little time on their hands and if the SPRinG approach is to have a more widespread impact it needs to be simplified in some key ways.

Beyond this task we see two further immediate priorities. The first relates to the increased use of non-specialist support in classrooms, the consequence of the recent reviews on teacher workloads. During observation visits to classrooms we have collected informal evidence of the negative effects on work in groups by many of these teaching assistants, some with specialist training in supporting pupils with learning and behaviour problems. We think it important to obtain more systematic evidence of the way in which support staff impact on pupils' learning in groups and the steps that need to be taken to remedy some of the limitations in the current approaches adopted by many

schools as part of 'inclusion policies'. To some extent this will be pursued by Blatchford and colleagues working on the DfES funded project on deployment and impact of support staff in schools.

Our second priority relates to initial teacher training. It is manifestly clear from our study that to facilitate effective group-work in their classrooms teachers need to have developed beyond the novice stage so that they have internalised a variety of skills to do with problem solving, classroom management and personal relationships which are more characteristic of expert practitioners (Berliner 2002). The current one-year PGCE course would appear to offer insufficient time for trainees to acquire sufficient skills to develop effective group-working in their classrooms. At present, we know little of the ways in which our University colleagues and the school mentors in partnership schools attempt to pass on these group-working skills during initial training, nor how successful these attempts are. Studies of this kind should have much to say to policy makers concerning the present organisation of the PGCE year including the possibility of alternative programmes which incorporate initial training within a longer induction programme where students are expected to master the basic skills of classroom teaching before tackling more complex pedagogies such as grouping and group work.

Other themes for future research are suggested by our experiences within the project. One key difficulty experienced by many pupils at KS2 was resolving what were often petty disputes and being able to reach and make compromise decisions. Teachers and the researchers were able to identify a variety of strategies with pupils for overcoming these problems, and these were described in the handbooks. However, further research is needed to examine the particular problems and resolution strategies in order to identify implications for theory and further practical strategies.

A further area of research that has arisen out of the project relates to the linkages between children's informal peer relations (as often expressed outside of the classroom – usually at breaktime) and classroom engagement and learning. An assumption in the group-work literature is that peers working together are of 'equal' status and indeed this is a key distinction between Piagetian and Vygotskyan theories of social learning. While much previous research relates to peers being of equal cognitive status, there is little work that focuses on differences in terms of status on more social dimensions such as popularity, leadership, friendship and social involvement in social networks. Peer relations can have a huge impact on classroom life and the success or not of group work. Similarly, group-work between certain types of pupils can have beneficial effects on children's peer relations. Further research and funding on this issue is currently being pursued by SPRinG researchers.

Another key topic for future research relates to the topic of transfer between primary and secondary schooling, behaviour and how this relates to grouping strategies and group work. We are currently investigating this further in collaboration with Judy Sebba at the University of Sussex and members of the ScotSPRinG team are also hoping to follow up the effects of SPRinG on transfer.

Conclusion
We would claim that the study has the potential to make a considerable impact on contemporary educational policy and practice of the kind envisaged in the original TLRP concept. As far as we are aware this is the first study of group-work in the UK to show positive attainment gains in comparison to other forms of classroom pedagogy. Further, despite common views to the contrary, group-work can be successfully used and implemented into everyday primary and secondary school classrooms and personal relationships between teachers and the class and between pupils within the class improve, provided teachers take time to train pupils in the skills of group working. This has important implications for the current concerns about school discipline where the trend is to

concentrate on whole school managerial solutions designed to control rather than eliminate the problem.

The study is characterized by an intervention over a far longer time frame than many. It is also important to stress that the evaluation deliberately addressed a general programme of guidance and activities, accompanied by teacher meetings and visits to schools, covering a whole school year and was designed to underpin all class and curricular activities. The SPRinG programme was designed as a total package, and was evaluated as such.

We have found that teachers and schools have responded positively to involvement in the SPRinG project and have contributed greatly to the development of a set of key principles and activities for use by other teachers. Valuable lessons have been learned about the effects of aspects of group composition, stability and size, classroom layout and seating arrangements, group-work training for pupils and ways in which teachers can encourage and evaluate group work. The Handbooks produced at each KS have been widely appreciated, and demand for them in the UK and overseas has been growing. Although results varied to some extent between Key Stages, we found in the main evaluation of SPRinG (Phase 3) that it has positive effects in terms of academic outcomes and classroom behaviour. Results concerning pupil attitudes and group-work were less clear cut, but classification of pupils into types promises further insights into factors influencing successful group work, as well as effects on children at different attainment levels. Valuable information has been collected about the applications of group work, e.g., in terms of whole school approaches and schools working under difficult circumstances – information that we believe is essential if group-work is to be applied more extensively.

We end with a fundamental concern that arises from the conflict between the pedagogical assumptions of the current study and much current classroom practice. There are three main contexts for learning in any classroom: teacher led contexts, individual work and interactions between pupils (Baines, Blatchford & Kutnick, 2003). We have argued that the educational advantages of peer based interactions have been neglected, certainly in the UK. Our research shows that peer-based group-working can be a productive part of classroom activity. But, as we have said, observational studies of classrooms show many efforts by teachers to interact with groups in their classrooms, but very few opportunities for the development and use of interactions *within* groups. Grouping arrangements that currently characterise many classrooms are just as likely to inhibit learning as they are to promote it. In parallel work (Blatchford et al, 2003) we have found that teachers in English schools have a strong belief in the value of addressing the individual needs of pupils. This often informal pedagogical view can conflict with pressures arising from the curriculum and the classroom context, especially when they have large numbers of children in their class. They feel forced to use more teacher led and especially whole class teaching sessions than they might like. We suggest that they could help themselves by making more use of group-work as a way facilitating pupil involvement – it offers learning possibilities for pupils not provided by either teacher led situations or individual work. It seems to us, therefore, that we need to rethink current pedagogical theories, both formal and informal, which seem to favour teacher led situations and individual work. It is hoped that this project is helping to put group-work on the educational map. We hope that this is the beginning of more systematic use of group-work; it deserves to be given a much more central role in educational policy and school practice.