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REVIEW

A systematic review of pedagogical approaches that can effectively include children with special educational needs in mainstream classrooms with a particular focus on peer group interactive approaches

This review is supported by the Teacher Training Agency (TTA) to promote the use of research and evidence to improve teaching and learning

Review conducted by the TTA-supported SEN Review Group

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CONFLICT OF INTERESTS

There are no known conflicts of interest

LIST OF ABBREVIATIONS

ANOVA	Analysis of variance
ANCOVA	Analysis of covariance
BERA	British Education Research Association
CBA	Curriculum-based assessment
CIRC	Cooperative integrated reading and composition
CPD	Continuing professional development
DES	Department of Education and Science
DfE	Department for Education
DfEE	Department for Education and Employment
DfES	Department for Education and Skills
EPPI-Centre	Evidence for Policy and Practice Information and Co-ordinating Centre
ERIC	Educational Research Information Clearinghouse
GIsML	Guided inquiry supporting multiple literacies
ITE	Initial teacher education
RCO	Revised curriculum only
SGRC	Social group revised curriculum
SEN	Special education needs
TAI	Team-assisted individualisation
TTA	Teacher Training Agency
UK	United Kingdom
USA	United States of America
WoE	Weight of evidence

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SUMMARY

Background

The broad background to this review is a long history of concepts of special pupils and special education, and a faith in special pedagogical approaches. The rise of inclusive schools and some important critiques of special pedagogy (e.g. Hart, 1996; Norwich and Lewis, 2001; Thomas and Loxley, 2001) have raised the profile of teaching approaches that ordinary teachers can and do use to include children with special educational needs in mainstream classrooms. Inclusive education itself is increasingly conceived as being about the quality of learning and participation that goes on in inclusive schools rather than simplistic matters of where children are placed.

Policy and practice background

The policy of including pupils with special education needs (SEN) in mainstream schools and classrooms in England and Wales was importantly marked by the Warnock Report (DES, 1978) and has since gained momentum with Codes of Practice (DfE, 1994; 2001), government guidance (DfEE, 1997; 1998) and legislation (1981, 1993 and 1996 Education Acts; SENDA). There now is a statutory requirement on mainstream schools to provide effective learning opportunities for all pupils by setting suitable learning challenges, responding to pupils' diverse learning needs and overcoming potential barriers to learning and assessment for individuals and groups of learners.

Research background

Previous systematic literature reviews related to the area of special educational needs and inclusion have focused on behavioural concerns and behaviour management in schools (Harden, 2003); the impact of paid adult support on the participation and learning of pupils in mainstream schools, including pupils with SEN (Howes *et al.*, 2003); and school-level approaches to facilitating the participation by all pupils in the cultures, curricula and communities of schools (Dyson *et al.*, 2002). Non-systematic (in technical terms) literature reviews have addressed the question of whether there is a particular pedagogy for special educational needs or each type of SEN, particularly types of learning difficulty, but not related to mainstream contexts (Norwich and Lewis, 2001), or asked about approaches that can effectively include children in mainstream schools beyond classroom pedagogy (Sebba and Sachdev, 1997). While research has sought to establish the effectiveness of particular pedagogies or the impact of school actions on pupil participation, there has been no prior systematic review that can answer the question of which pedagogical approaches can effectively include children with SEN in mainstream classrooms.

Aims

The overall aim of the three-year project is to utilise the expertise of the research team in researching the evidence base in relation to inclusive pedagogy. In year one, the focus is effective pedagogical approaches in use in mainstream

classrooms with children with special educational needs, aged 7–14 years. The main aim of this systematic review is to investigate which pedagogical approaches can effectively include children with special educational needs in mainstream classrooms.

Review questions

Our review question is as follows:

What pedagogical approaches can effectively include children with special educational needs in mainstream classrooms?

Our in-depth review focuses on the following two related but more specific questions:

Question (a): Does a pedagogy involving a peer group interactive approach effectively include children with SEN in mainstream classrooms?

Question (b): How do mainstream classroom teachers enhance the academic attainment and social inclusion of children with special educational needs through peer group interactions?

Methods

When the review question had been agreed, a search was conducted. Search terms generated were aligned with the varying word usages in different countries and the British Education Thesaurus was used for selecting synonyms. All studies returned from searches were incorporated into EndNote bibliographic software, enabling good compatibility with the EPPI-Centre systems.

The studies were screened employing specific inclusion criteria to identify studies with a specific scope (a focus on pupils aged 7–14 who experience special educational needs, in mainstream classrooms, including pedagogical approaches and an indication of pupil outcomes); study type (empirical); and time and place (written in English and published after 1994) (see Appendix 2.1). A range of electronic databases and citation indexes were interrogated (see Appendix 2.2) and internet sites were searched (see Appendix 2.3). Screening was applied first to titles and abstracts (in two iterative stages) and then to full documents. Screening was conducted by two independent screeners on all titles and studies, and the EPPI-Centre link-person on a sample for quality-assurance. For pragmatic reasons, document retrieval ended on 31st March 2004; any studies received after that time will need to be included in any update.

The identified studies were taken through a series of graduated filters, culminating in the shortlist of studies. These were keyworded, using the EPPI-Centre (2003) Keywording Strategy (version 0.9.7) with review-specific keywords (see Appendix 2.4) in addition to EPPI-Centre keywords. This generated the 'descriptive map' of the studies in our review which provides a picture of the kinds of research that have been conducted together with details of their aims, methodologies, interventions, theoretical orientation, outcomes and so on. This process did *not* attempt to assess the quality of the studies.

Discussion among the full review team and the advisory group of the most useful cluster of studies identified in the systematic map led to the re-focusing of the study onto two specific questions for the in-depth review. The in-depth review thus focuses on a group of pedagogical approaches characterised by peer group interactions that were conducted by mainstream teachers without necessitating additional staff resource; the review asked about their effectiveness and how teachers used the approaches. New inclusion and exclusion criteria were applied to the studies in the map leading to a subset of studies for the in-depth review. Data-extraction (using EPPI-Centre guidelines) was undertaken on these by two independent reviewers and any differences discussed and resolved.

The quality of studies and weight of evidence (WoE) were assessed using the EPPI-Centre data-extraction framework to assess the reliability and quality of each study, and focus judgements about the trustworthiness of study results and the weight of evidence that the study could contribute to answering the in-depth review questions. Judgements about the relative weight of evidence of each study were made using the following explicit criteria: the soundness of studies (internal methodological coherence); the appropriateness of the research design and analysis in relation to the review questions and the relevance of the study topic focus to the review questions. Taking into account quality of execution, appropriateness of design and relevance of focus, an overall weight of evidence judgement was made using a consistent formula (see Chapter 2). As quality-assurance, each study was independently reviewed and data-extracted by two different members of the review team or a member of the review team and the EPPI-Centre link person.

The findings of the individual in-depth studies were synthesised and conclusions and recommendations drawn. Synthesis took the form of eliciting a qualitative and quantitative overview for the effectiveness question and a structured narrative describing any overall, cross-study patterns or themes related to how teachers use peer group interactive approaches.

Results

A total of 2,095 potentially relevant reports were identified for the current review. Over half (1,156) were excluded in the first screening of titles and abstracts (see Table 3.1) and a further 238 were excluded in a second iteration of the process. A total of 450 were sent for and 14% of these (64) were not received within the timeframe of the review or were unavailable. A total of 383 full reports were screened, resulting in the exclusion of a further 315 reports, leaving 68 that met the criteria for inclusion in the mapping study.

In the application of exclusion/inclusion criteria to the collection of titles and abstracts, the measure of inter-rater reliability between the two members of the review team was good (Cohen's Kappa 0.62). Nonetheless, for rigour all, rather than a sample of the titles and abstracts, were double-screened. There was 80% agreement for the two reviewers across the set of titles and abstracts. The kappa statistic for inter-rater reliability between each of the review members and our EPPI-Centre link person was lower but fair (Cohen's Kappa 0.35). This difference is most plausibly explained by the difference in expert knowledge of the subject matter between the review team members and our EPPI-Centre link person.

Most of the 68 studies in the map were identified through the electronic searches on PsycInfo and ERIC. Most of the studies were researcher-manipulated

evaluations and most were undertaken in the USA. The majority did not focus on curricular issues, but, of those that did, literacy dominated. Primary school contexts were twice as prevalent as secondary school contexts. The target groups were mostly mixed sex pupils with learning difficulties. Regular mainstream teachers mostly carried out the teaching interventions, with special teachers and peers also often involved. The most common pedagogical approach was adaptation of instruction, often combined with other types of adaptation: materials, classroom environment and assessment. Just under a quarter of the studies involved peer group interactive approaches.

In-depth review

Ten studies were included in the in-depth review and nine of these were conducted in the USA. With the exception of two exploration of relationships studies, the studies were evaluations, mostly researcher-manipulated (six). Six of the studies focused on literacy and six were conducted in primary school settings.

Five studies were included in the synthesis for review question (a) and seven for review question (b). Question (a) studies researched cooperative learning, guided inquiry and Circle of Friends approaches. Outcomes measured include engagement in classroom activities, curriculum performance and social interactions with peers/social acceptance. Effect sizes were reported in four studies, ranging from small to fairly large. Synthesis of question (b) studies led to five substantive themes emerging: the model of pupil-as-learner; integration of academic and social considerations; organisational and organised support; holistic views of 'basic skills', and shared philosophy.

Conclusions

Several studies were deemed to be medium or medium-high in terms of weight of evidence, but an issue remains about the scale of evidence available to address the research questions. Good quality studies, which incorporate empirical validations of effectiveness, were, unsurprisingly, based on small samples. There were no studies with high weight of evidence for question (a) and only one for question (b). The strength of confidence we can have in the evidence is therefore measured. Despite these limitations, the review did lead to some substantive findings and offers a basis on which to make some recommendations for practice. The likely effectiveness of peer group interactive approaches for inclusion of children with special educational needs in mainstream classrooms can be established and we have an evidence base (albeit small) on how teachers use these approaches, that is some qualitative understanding of the processes at work.

There is a small accumulation of evidence about the effectiveness of cooperative learning, particularly in relation to the curriculum area of literacy. Cooperative learning encompasses a range of teaching practices and the evidence base relates to the elements of social grouping/teamwork, revising and adapting the curriculum and working with a cooperative learning school ethos. Specific evidence is available for the effectiveness of two specific cooperative learning programmes. Evidence of effectiveness also relates to programmes associated with other related types of peer group interactive approach: guided inquiry and Circle of Friends.

All the studies show evidence of some learning and, with the exception of the Circle of Friends approach, this has included learning in the academic domain. Three studies provide explicit evidence of impact on both the academic learning and community participation of pupils with special educational needs. A further study provides evidence of academic rather than social gains. The evidence also indicates improved attitudes toward curriculum areas and children's own views of their competence, acceptance and self-worth. The evidence indicates that peer group interactive approaches that are effective in academic terms are also often effective in terms of social participation and children's attitudes to their learning. Teasing out the elements of the approaches that are functionally related with each outcome is difficult and perhaps unnecessary in professional rather than research terms.

The model of pupil as learner and having active agency in the construction of personal knowledge underpinned the studies and the interventions. Teachers fostered the co-construction of knowledge through scaffolding by, and dialogue with, peers. The studies' authors recognised that a sense of belonging to and participation in the learning community has an important effect on young people's learning in schools. Teachers made use of organisational support for community participation and organised support for peer group interactive approaches using peers and adults together with careful planning. An holistic approach to skill development underpinned many of the interventions in contrast to the isolated skill development associated with traditional remedial programmes for special needs. Making use of peers may bring with it a necessity to make skill development socially meaningful. Finally, the studies indicate a role for shared philosophy and common concern with participation in the learning community, cooperation and collaboration.

Strengths and limitations

This systematic literature review had both strengths and limitations. It was strong in asking relevant questions of use to teachers where limited resource is an issue. It encompasses studies of pupils representing a wide range of SEN and there was high quality-assurance for the review: screening, data-extraction and quality-assessment was conducted by two independent review team members (or a review team member and EPPI-Centre link-person) at each stage. Confidence in the review findings is strengthened by the quality of the studies and the rigorous check on quality that were applied.

The literature review was limited in scope to material from 1994 and excluded pupils in the early years or post-14. The in-depth review was dominated by studies in primary contexts, meaning that as we move up through the school system to age 14, so our degree of confidence about the evidence for peer group interactive approaches drops considerably. Scope was also limited by the studies that did not arrive in time to be scrutinised in full. These tended to be unpublished theses and therefore may be systematically different from the studies included in the map and in-depth review, adding to the possibility of some distortion from publication bias. Negative or null outcomes are less likely to be published, which means the picture emerging from the systematic review may be over-optimistic.

The review is also limited in the strength of the evidence base arising from this systematic review. The lack of randomised control trials means that evidence of effectiveness is not as strong as it could be. The number of studies in the synthesis is small and the numbers in the samples for these are also small. While we know enough about the pupils with special needs who participated in the

studies to begin to judge generalizability, we know less about the teachers themselves and how representative they may be. We also know that the contexts for the studies are likely to differ from the contexts in which teachers in the United Kingdom (UK) may be working.

Implications for policy, practice and research

Policy-makers should be aware that there is a shortage of evidence about the nature of teaching approaches that effectively include children with special educational needs in mainstream classrooms. There is, however, some evidence that peer group interactive approaches can be effective and policy should not deter teachers from adopting such approaches. The research base generated about whether peer group interactive approaches are effective and in particular how teachers use them should be disseminated to teacher educators, advisers, student teachers and teachers.

Teachers should recognise that effective teaching for inclusion is complex, often combining attention to (subject-specific) adaptation of teaching or curriculum with attention to community participation, social grouping and roles within the group. According to this review, teaching approaches that effectively include children with special educational needs cannot be reduced to simplistic formulae but rather bring together teacher skills alongside a willingness and ability to utilise pupil skills. Given the complex nature of inclusive and peer group interactive pedagogy, teachers in training would need opportunities to reflect on their practices in the light of the existing research base.

Implications for research are that more rigorously designed studies are needed to evaluate teaching approaches to include children with special educational needs in mainstream classrooms. The small samples involved mean that a series of N=1 randomised interventions giving rise to high levels of trust would be appropriate alongside research and development projects. Consideration should be given to indicators of pupil progress that are rich and varied, and not just to indicators that are readily measurable. Current evidence comes primarily from the USA and the primary school sector, and studies in the UK and secondary school contexts are needed. Other teaching approaches contained within the descriptive map of this review, such as peer tutoring and adaptation of instruction, warrant further systematic study and in-depth review. Immediate attention might usefully be given to the studies that could not be retrieved in time for inclusion in this review.

1. BACKGROUND

This chapter identifies the aims and rationale for the review as well as some definitional and conceptual issues. It describes the policy and practice context and considers the existing reviews in the field. It briefly describes the authors of the review, notes the funders and identifies the different users for whom it is intended. It concludes by specifying the review questions.

1.1 Aims and rationale for the current review

Despite a large literature, there is a lack of clarity about the appropriateness of empirical research and evidence regarding 'best practice' in the area of pedagogical approaches for pupils with special educational needs in mainstream schools. A significant factor in this situation is the challenges for empirical outcome studies where a multiplicity of environmental and interacting variables needs to be considered.

Teachers now also face an ever-widening diversity of pupils in mainstream schools (Audit Commission, 2002), meaning that they are likely to seek and want support in meeting special educational needs. In pursuing such support, teachers and teacher-trainers face countless claims of specialist techniques and materials that are often untested and have a poor theoretical basis. It was therefore considered important to conduct a review of research to provide a sound evidence-base to inform practice and allow new entrants to the teaching profession to meet classroom challenges in an informed and appropriate manner.

In the first review of a programme of three related literature reviews over three years, the question addressed in the review reported here is:

What pedagogical approaches can effectively include children with special educational needs in mainstream classrooms?

The aims of the review are to:

- Create a descriptive map of research undertaken in the area of effective pedagogical approaches that enable children with special educational needs to be included in mainstream classrooms

- Determine and examine the nature of pedagogical approaches, particularly classroom learning environments and teaching methods and styles, which enable children who experience difficulties in learning to participate fully in the community of learners in mainstream classrooms

1.2 Definitional and conceptual issues

Special educational needs has been an important defining concept in the UK since it was brought to public attention in the Warnock Report (DES, 1978) and subsequent legislation. It is, however, a concept that is subject to critical scrutiny: for its emphasis on what is special about a pupil rather than what is ordinary or indeed unique; for its continued role in labelling children and for the

preoccupation with needs rather than wants or rights (Roaf and Bines, 1989). Whilst not originally intended as such, the term has been used to refer to within-child difficulties rather than to difficulties that arise in an educational context.

One of the legacies of the long history of concepts of special pupils and special education is a faith in special procedures and approaches, and in turn continued growth of pedagogical practices that frequently fail to address the issue of inclusion (Skrtic, 1991). Norwich and Lewis' (2001) in-depth review of evidence, however, indicates that a taxonomy of appropriate pedagogic approaches for particular special educational needs is a construct unsupported by evidence. There is also a conceptual argument, strongly advocated from within the inclusion movement but not exclusive to it, that good teaching is, or can be, good teaching for all (Ainscow, 1997; Hart, 1996; Thomas and Loxley, 2001).

In addition to the conceptual debate about special educational needs and special pedagogical approaches there is conceptual confusion about what it means to include pupils effectively. Definitions of inclusion are often made in comparison with integration to distinguish between the school making (often radical) adjustments to include children (inclusion) and children being required to change or be ready to fit into unchanged schools (integration) (Mittler, 2000). To include effectively in mainstream is defined as much more than a simple issue of placement (Rouse and Florian, 1997): it is increasingly conceived as being about the quality of learning and participation that goes on in schools.

1.3 Policy and practice background

In England and Wales, the Warnock Report (DES, 1978) was the first of a series of markers that placed increasing emphasis on the policy of including pupils with SEN in mainstream schools and classrooms. This policy trend gained momentum in the 1990s with the 1994 Code of Practice on the Identification and Assessment of Special Educational Needs (DfE, 1994), the green paper Excellence for All Children (DfEE, 1997) and the subsequent Programme of Action (DfEE, 1998). This reflected more global trends characterised by the Salamanca Declaration and Framework for Action arising from the UNESCO (1994) World Conference on SEN.

The 'General Statement for Inclusion' in Curriculum 2000 (QCA, 2000), to which all teachers must adhere, places a statutory requirement on mainstream schools to provide 'effective learning opportunities for all pupils' and sets out three 'key principles for inclusion':

- Setting suitable learning challenges
- Responding to pupils' diverse learning needs
- Overcoming potential barriers to learning and assessment for individuals and groups of learners

A progressive and developing three-year review programme has been designed to utilise the expertise of the research team in relation to the Statement for Inclusion. In year one, the team has focused on effective pedagogical approaches in use in mainstream classrooms with children with special educational needs, aged 7–14 years. The focus of subsequent reviews will emerge during the process and could be around a different age group and a different setting (such as special schools, specific needs or specific processes).

1.4 Research background

Previous systematic literature reviews related to the area of special educational needs and inclusion focus on:

- Issues concerned with appropriate responses to behavioural concerns and behaviour management in schools (Harden, 2003)

- The impact of paid adult support on the participation and learning of pupils in mainstream schools, including pupils with SEN (Howes *et al.*, 2003)

- School-level approaches to facilitating the participation by all pupils in the cultures, curricula and communities of schools (Dyson *et al.*, 2002)

These reviews focus on either (a) a more specific sub-category of children with SEN or (b) all children, including those with SEN. There will be some overlap in terms of studies of pedagogical approaches but classroom-level pedagogical approaches have not been their focus.

Similarly, previous research also includes non-systematic (in technical terms) literature reviews which have been more or less specific in the community of learners they focus on and their interest in pedagogy. Brahm Norwich and Ann Lewis (2001) addressed the question of whether there is a particular pedagogy for special educational needs or each type of SEN, but narrowed their scope to types of learning difficulty. They did not, however, address the particular issue of whether the pedagogical approaches can effectively include children in mainstream schools. Sebba and Sachdev (1997) ask about what works in inclusive education, but looked outside the 7–14 age-range and beyond classroom pedagogy to wider policy, support and organisational dimensions.

While research has sought to establish the effectiveness of particular pedagogies or the impact of school actions on pupil participation, there has been no prior systematic review that can answer the question of which pedagogical approaches can effectively include children with SEN in mainstream classrooms.

1.5 Authors, funders and other users of the review

As the major agency in England with oversight of teacher education, the Teacher Training Agency (TTA) commissioned this review. The Evidence for Policy and Practice Information and Co-ordinating Centre (EPPI-Centre) at the Institute of Education, University of London worked closely with the TTA and the review team, training core team members and assuring quality. Funding of the review by the TTA was supported in kind by the Open University and Leeds Metropolitan University (LMU).

The review team comprised established academics with expertise in special and inclusive education, initial teacher education (ITE) and continuing professional development (CPD), and training and practice in systematic review procedures. It also included a qualified librarian, experienced in searching electronic databases and setting up data storage and retrieval systems. Team members had previously co-researched and co-authored on several research projects, including systematic reviews. The team's involvement with initial and continuing teacher education means that it is well placed to address the implications of the review on raising standards and on the quality of teacher education, and to build the

capacity of teacher educators to carry out further reviews.

Janice Wearmouth's research has focused on the 'problem space' in mainstream school special educational provision. She has developed and tutored CPD modules in the areas of the co-ordination of special educational provision; difficulties in literacy development; developing inclusive curricula; and, in collaboration with the University of Waikato, New Zealand, behaviour management. Her research includes evaluation of e-conferencing in CPD in the special needs field, home-school literacy partnerships to support children with difficulties, schools' use of the SEN Register and explorations of pupils' narrative of the experience of difficulties in literacy acquisition. Melanie Nind and Kieron Sheehy have also taught and produced distance-learning materials in the areas of special education and inclusive education at undergraduate and postgraduate levels. Melanie Nind's primary research focus has been the development and evaluation of interactive and inclusive pedagogy for pupils with severe and profound learning difficulties. With colleagues on the team, Janet Collins, Kathy Hall and Kieron Sheehy, she has also researched the process and cultures of inclusion in schools. Kieron Sheehy has broad experience in the field of special and inclusive education as both a teacher and educational psychologist. He has been involved in higher education provision across a range of professions in England and Ireland. His particular research interest is in technological assistance in addressing barriers to learning.

Janet Collins' main interests are primary education and, in particular, the development of pedagogic approaches for children who exhibit non-participatory behaviour in school. Janet Collins and Jonathan Rix have worked on some of the Open University's first foundation degree courses for teaching assistants working in primary education. Jonathan Rix has taught in a wide variety of community settings, including prisons, day-centres and youth groups. He is a parent representative for the National Portage Association and has research interests in intellectual access to Heritage sites and the value of simplified materials in the inclusive classroom.

Kathy Hall heads the Centre for Educational Research at LMU, contributes to ITT and CPD courses, and co-ordinates educational research awards. She led the ESRC-funded study of teacher assessment at Key Stage 1 and the British Council funded study of inclusive cultures in South African schools.

In examining effective teaching approaches for including pupils with special educational needs in mainstream classrooms, it is intended that the review will be especially useful to teacher educators who can employ the research synthesis in their initial teacher education (ITE) programmes. It will also be of use to serving teachers who wish to improve their inclusive practice through analysis and reflection. The review of studies will help teachers, and especially prospective teachers, understand better how to adopt teaching approaches that will be effective for diverse groups, fostering positive social and academic outcomes.

1.6 Review questions

Our review question was as follows:

What pedagogical approaches can effectively include children with special educational needs in mainstream classrooms?

More specifically, this involves seeking answers to important subsidiary questions, such as the following:

- What kind of classroom practices do pupils themselves feel support them and their learning in mainstream classes?

- What classroom environments enable all pupils to thrive and make progress?

- What approaches/techniques are used which set out to include the diversity of pupils in classrooms?

- Which of those approaches/techniques are the most successful in enabling the pupils with the lowest overall achievement levels to feel a sense of achievement/experience success?

- Which approaches/techniques/programmes are specially devised for particular pupils in mainstream classrooms?

- Which of these enable those individual pupils to experience success/achievement in the mainstream classroom?

Scope of the review
The review scrutinised and appraised research studies in the light of these questions and was based upon the following understanding of the key terms embedded in the key question.

The term 'effectively include' indicates a concern with the extent to which particular pedagogical approaches can be shown to have a positive impact upon aspects of the learning and participation of children with special educational needs; for example, their attainment levels, progress, attitude, confidence and/or skills. As the review team anticipated, each of the studies scrutinised in the review employed its own criteria upon which pedagogical approaches were deemed 'effective' or were chosen for study. This review focuses closely upon the criteria used in the studies and the extent to which they had been made explicit. For some, effectiveness is seen in terms of tangible pupil achievements, whilst for others on the ratings of teachers, teaching assistants, parents and the pupils themselves. It was anticipated that a common thread connecting the studies in our review would be a judgement that the pedagogies employed are concerned with effective classroom practices and approaches for pupils with special educational needs, where effective is interpreted broadly in terms of learning, behavioural and/or community participation outcomes and processes. This was the case.

The term 'pedagogical approaches' is used to mean, in the broadest sense: classroom practices, personnel deployment, organisation, use of resources, classroom environment and curriculum, that is, what occurs in classrooms that can be seen to impact on participation and learning.

In focusing upon 'special educational needs', the review was concerned with the learning needs of all those pupils identified as experiencing difficulties in learning of any kind, together with those identified as experiencing a categorised difficulty such as autistic spectrum disorder, sensory impairment, or specific learning difficulties. The team see this as an educational and not medical concept, with inherent fluidity and contingency. In this context, the term is used to categorise pupils for whom there may have been seen a need for special means of access to the curriculum, a special or modified curriculum, or a need to particularly attend to the social structure and emotional climate for learning (Weddell, 2003). In

these studies the pupils' needs will be met in ordinary classrooms through a pedagogical approach. While it is acknowledged that there is much to be learned from research on teaching approaches for other diversity and difference in the classroom, and this may be explored in the later years, this was not included in the initial literature review reported here.

The particular contexts examined in the review are those whose impact could be demonstrated in classrooms in mainstream schools serving the 7–14 age range. The particular age range encompasses, in the UK context, primary and middle schools and the first years of secondary schooling (Key Stages 2 and 3 in England and Wales). In the USA, this encompasses elementary, middle and junior high school classrooms. Studies from a range of countries were included in the search, as long as they were reported in English.

The team focused on those studies published since 1994 as this marked the global commitment to inclusion in the Salamanca agreement (UNESCO, 1994) together with a focus on practical responses to SEN in mainstream classrooms in England and Wales (DfE, 1994). This enabled a systematic research of research across the decade since the Salamanca Statement and since the inception of the Teacher Training Agency with its ongoing concern with effective practice for children with SEN.

2. METHODS USED IN THE REVIEW

This chapter begins by briefly outlining how users were involved in the review. It then sets out the methods of the review, detailing how we defined our terms and how we narrowed our focus. It explains the criteria used to include and exclude studies, and describes the methods used for finding studies. It also describes the screening and the quality-assurance process. It then describes how we progressed from a mapping of the studies to an in-depth review. An account is offered of how we assessed the quality of studies, how we conducted a synthesis of the evidence and the quality-assurance mechanisms we applied.

2.1 User-involvement

2.1.1 Approach and rationale

Regular contact with primary and secondary school teacher educators was maintained from the conceptualisation of the project to its conclusion. This deliberately included those with expertise in special educational needs and inclusive education, and those with little experience in this area in order to meet the needs of a range of users of the research. We also communicated directly with student teachers and teachers engaged in CPD about the focus of the review question and about the process of conducting a systematic review of the evidence.

The advisory group included teacher trainers, teachers, educational psychologists, advisers and government inspectors, all of whom have a special interest in the area of special education needs and inclusive education. Thus decisions about focus and process were made following dialogue with potential users of the research. International consultants Rosie Le Cornu (Australia), Paid McGee (Republic of Ireland) and Mere Berryman (New Zealand) advised both on research in their contexts and issues for users in other contexts.

2.1.2 Methods used

The advisory group provided a sounding-board for key matters of discussion. It also ratified decisions made. Regular briefings and invitations to respond to a set of questions were used to foster dialogue. Key stages for feedback were identification of the research question; identification of the major parameters; narrowing of criteria for the in-depth review; draft report; and development of user summary.

2.2 Identifying and describing studies

2.2.1 Defining relevant studies: inclusion and exclusion criteria

The mapping exercise *included* those studies that met *all* the following criteria:

Scope

- Include a focus on pupils who experience special educational needs of some kind (as defined in section 1.6)
- Are conducted in mainstream classrooms
- Include pedagogical approaches
- Include an indication of pupil outcomes (as defined in section 1.6)
- Are concerned with the 7–14 age range or some part of it

Study type

- Are empirical – exploration of relationships, evaluations or systematic reviews

Time and place

- Are written in English
- Are published or produced (if unpublished) after 1994

Studies were *excluded* if they met *one* of the following Stage 1 exclusion criteria:

Scope

- (Exclude 1) Not focused on pupils who experience special educational needs of some kind (as defined in section 1.6)
- (Exclude 2) Not conducted in mainstream classrooms
- (Exclude 3) Not concerned with pedagogical approaches
- (Exclude 4) Not indicating pupil outcomes (as defined in section 1.6)
- (Exclude 5) Not concerned with all or part of the 7–14 age range

Study type

- (Exclude 6) Descriptions, development of methodology or reviews other than systematic reviews

Time and place

- (Exclude 7) Not written in English
- (Exclude 8) Not produced or published after 1994

2.2.2 Identification of potential studies: search strategy

The following electronic databases and citation indexes were interrogated:

- ERIC (The Educational Research Information Center)
- BEI (The British Educational Index)
- PsycINFO
- AEI (Australian Education Index)
- BLPC (British Library Public Catalogue)
- COPAC

A systematic review of pedagogical approaches that can effectively include children with special 14
educational needs in mainstream classrooms with a particular focus on peer group interactive
approaches

- Dissertation abstracts

- ECO (Education Collection Online)

- Education Research Abstracts

- Papers First

- Child Data

- Education On-line

Key internet sites were searched (see Appendix 2.3), including research organizations, government and voluntary organisations. It was anticipated that journals not appearing in the database would be handsearched but this transpired to be unnecessary as the electronic search included all key journals. Sources from key informants were pursued.

A collection of appropriate search terms was generated for use in searching. Care was taken to vary the search terms to align with the varying word usages in different countries: for example, 'mainstream' school would be 'regular' school in some countries; 'difficulties in learning'/'learning difficulties' would be 'learning disabilities'. The British Education Thesaurus was used for selecting synonyms.

Search terms used for searching the bibliographic databases included the following sets in combination:

- Terms to indicate that the study was about children with special educational needs

- Terms to indicate that a study was about inclusive education

- Terms to indicate that a study was about pedagogical approaches

- Terms to indicate that the study involved pupils aged between 7–14

1	2	3	4
Special educational needs	Inclusion	Pedagogy	Schools
Special education program	Participation	Teaching style	Primary school
Disabilities	Mainstream(ing)	Learning environment	High school
Behaviour problems	Regular	Classroom organisation	Secondary school
Disabled pupils/ students	Ordinary	Educational intervention	Middle school
	Integration	Effective instruction	Key Stage 2
			Key Stage 3
			NOT adult education
			NOT early years

The key terms were developed in collaboration with the specialist librarian, who advised on the use of indexing languages for specific databases.

All studies returned from searches were incorporated into EndNote bibliographic software, enabling good compatibility with the EPPI-Centre systems.

2.2.3 Screening studies: applying inclusion and exclusion criteria

Within the constraints of time and resources, the team followed as closely as possible the protocols governing systematic reviews as described in the EPPI-Centre documentation. The team first performed a screening and mapping of studies, followed by an in-depth appraisal of particular subset(s). Screening was conducted by two independent screeners; a random sample of 20 titles and abstracts and 10 full articles was also screened by the EPPI-Centre link person.

We focused on as wide and as comprehensive a range of research studies as we could and included work that was both quantitative and qualitative in orientation. Previous work had suggested that much of the relevant research would combine quantitative and qualitative methodologies, and that studies would commonly involve case studies of a single classroom or school, sometimes as part of bigger projects. We applied inclusion and exclusion criteria successively to (i) titles and abstracts (twice) and (ii) full reports. A second application of the criteria to titles and abstracts was conducted after the first screening, which, having operated on the basis of including those studies where one of the independent reviewers had scored 'Include', produced a high number of studies. In a second process, the titles and abstracts were re-examined, applying the criteria more rigorously and using additional information which was sought where it was missing. Exclusions from this second level screening were recorded separately.

We obtained full reports for those studies that appeared to meet the criteria. We entered the included items into a second database. We applied the inclusion and exclusion criteria to the full reports and excluded those that were found not to meet the inclusion/exclusion criteria. Again, two independent screeners applied the criteria, with a sample also screened by the EPPI-Centre link person.

The studies included in the review proceeded through a series of graduated filters. A database was made of all the studies retrieved from the electronic databases, electronically processed online journals and searches of websites. Initially, the inclusion and exclusion criteria were applied to the titles and abstracts of studies in this database. This was done independently by pairs of members of the review team who, working in collaboration with the EPPI-Centre link person, eventually shared and resolved any uncertainties that occurred about individual studies and then drew up a list of those studies which met the inclusion/exclusion criteria. These studies were entered into a second database (EndNote 2). Full copies of all studies in this second database which appeared to meet the criteria were obtained and the criteria were re-applied so as to exclude any which, upon fuller scrutiny, did not meet the inclusion criteria.

2.2.4 Characterising included studies

All the studies which remained were keyworded, using the EPPI-Centre (2002a) Keywording Strategy (version 0.9.7) with review-specific keywords (see Appendix 2.4) in addition to EPPI-Centre keywords. This helped us to build a descriptive map of the studies in our review and provide a full and clear picture of the kinds of research that have been conducted together with details of their aims, methodologies, interventions, theoretical orientation, outcomes and so on. This process did *not* attempt to assess the quality of the studies.

2.2.5 Identifying and describing studies: quality-assurance process

As quality-assurance, two studies were keyworded by all five members of the review team new to the process, allowing for deliberation over the process and clarification of the guidance and protocol. Each study was then keyworded by two members of the review team, working first independently and then comparing their decisions and coming to a consensus. Three teams of two keyworders conducted this process and more novice review team members were paired with experienced or trained reviewers. A random sample of 10 studies was keyworded by the EPPI-Centre link person.

This keywording revealed the need to apply new, narrower criteria in order to isolate a particular subset of our studies for further in-depth scrutiny and review.

2.3 In-depth review

2.3.1 Moving from broad characterisation (mapping) to in-depth review

During the course of the mapping, it became clear to the review team that there was a large number of studies in the field and that it would not be possible to review in depth all 68 studies found. In a meeting of the review team, it was agreed that the original research question would be refined to focus on a more specific theme within it.

The review team addressed the issue of narrowing down the focus for the in-depth review. Possible foci for the in-depth review were ruled out on the basis of being too broad (studies sharing a broad aim or broad collection of outcomes) or not generically useful (studies focused on a particular category of special educational need). Some of the studies we had keyworded had involved interventions specifically focused only on those pupils with special educational needs or had involved investment of considerable resources and we judged these to be of limited usefulness for the users of the research. We wanted to focus the in-depth review on studies of pedagogical approaches used by ordinary teachers for the whole class and not requiring specialist resources. The prominent categories of pedagogical approaches meeting these criteria were those keyworded as peer-group interactive and peer tutoring. It was essential that our views on the usefulness of these criteria and approaches were informed by the views of the advisory group. Review team members took responsibility for interviewing the consultants and advisory group members about this issue. The responses indicated endorsement of the potential of peer tutoring and particularly peer-group interactive approaches, which ordinary teachers could use without additional resource. An educational psychologist on the advisory group noted 'our education system is absolutely littered with examples of peer assisted learning from the very earliest schools and, although peer tutoring, etc. went out of fashion for a while, happily [it] is now appearing in all sorts of guises in our schools'. Similarly, an international consultant advised that peer group interactive approaches 'are in keeping with the emphasis in many primary classrooms today on collaborative teaching and other participatory pedagogies. As more and more priority is given over to pupils making meaning of what they are learning and doing this in conjunction with their peers, then it seems sensible to investigate

how children with special needs operate in such environments'.

Two related dimensions emerged from discussion of what it was we wanted to learn from studies of peer group interactive approaches: the dimension of evidence of the effectiveness of these approaches and the dimension of what they involved. Thus, the questions for the in-depth review became:

Question (a): Does a pedagogy involving a peer group interactive approach effectively include children with SEN in mainstream classrooms?

Question (b): How do mainstream classroom teachers enhance the academic attainment and social inclusion of children with special educational needs through peer group interactions?

On the above basis, inclusion and exclusion criteria on the scope of the studies for the in-depth review were drawn up to include studies:

- With a focus on a peer group interactive pedagogical approach beyond peer tutoring/behavioural prompting
- Conducted by mainstream classroom teachers without necessitating additional staff support
- Indicating academic and/or social interaction/involvement outcomes measured through systematic data-gathering

2.3.2 Detailed description of studies in the in-depth review

Pairs of independent reviewers applied the inclusion/exclusion criteria to all the studies in the descriptive map to elicit studies that satisfied requirements for inclusion in the in-depth review. Studies in the in-depth review were then data-extracted and quality appraised, using the EPPI-Centre guidelines (EPPI-Centre, 2002b). Any disagreements between the reviewers were discussed and resolved. In addition, a pair of reviewers appraised the weight of evidence judgements for all the studies to check for consistency of application of the agreed protocol. Information about the study population, sampling, data-collection and analysis, as well as the results and conclusions, were recorded and described in brief accounts of the papers (see Chapter 4) and detailed summaries of the studies (see Appendix 4.1).

2.3.3 Assessing quality of studies and weight of evidence for the review question

Each study was independently data-extracted by two team members using EPPI Reviewer, with two studies data-extracted by the EPPI-Centre link person for quality-assurance purposes. The quality of studies and weight of evidence (WOE) were assessed using the EPPI-Centre data-extraction framework and we turn to this now.

The EPPI-Centre guidelines and software assisted our investigation of the reliability and quality of each study meeting the inclusion criteria by focusing our judgements about the trustworthiness of study results and the weight of evidence that the study could contribute to answering the review question.

Judgements about the relative weight of evidence of each study were made using the following explicit criteria:

A. soundness of studies (internal methodological coherence) as they stand

B. appropriateness of the research design and analysis in relation to the review question

C. relevance of the study topic focus to the review question

D. taking into account quality of execution, appropriateness of design and relevance of focus, the overall weight of evidence provided by the study to address the question of the systematic review

In weight of evidence A, the soundness or trustworthiness of studies, the team considered the extent to which the study is adequately described, whether it has clear aims, whether it is clear about how its sample has been chosen, and the appropriateness of the sample design for the research focus. The team considered the adequacy and appropriateness of the data-collection and analysis methods for the study focus. Overall, we rated a study as being of high, medium to high, medium, medium to low, or low soundness.

For weight of evidence B–D, judgements were made in relation to each of the two in-depth review questions. In weight of evidence B, the appropriateness of the research design and analysis in relation to review questions (a) and (b), the team again rated the studies as high, medium to high, medium, medium to low, or low, according to the extent to which we judged that the research design was appropriate to each.

For weight of evidence C, the relevance of the study topic focus to the review questions, the team judged how well the data collected helped to answer each question and rated the studies as above, according to whether the team considered that the focus of the study was relevant to answering each review question.

The judgements for the three aspects were combined into an overall weight of evidence towards answering the review question. This was not done numerically but according to the formula below:

To gain a HIGH overall WoE D rating	• the ratings for WoE A–C all have to be HIGH
To gain a MEDIUM–HIGH overall WoE D rating	• the ratings for WoE A–C all have to be MEDIUM–HIGH; or • WoE A–C have to include two highs and no lows (and WoE B is of medium high); or • MEDIUM–HIGH has to be the middle rating (as in one high, one medium–high and one medium) and WoE B is of at least medium high
To gain a MEDIUM overall WoE D rating	• the ratings for at least two of WoE A–C have to be MEDIUM, including WoE B; or • MEDIUM has to be the middle rating (as in one medium and one either side of medium) and WoE B has to be at least medium rating
To gain a MEDIUM–LOW overall WoE D rating	• the ratings for WoE A–C all have to be MEDIUM–LOW; or

	• MEDIUM–LOW has to be the middle rating (as in one medium, one medium–low and one low) and WoE B is at least medium low rating
To gain LOW overall WoE D rating	• the ratings for WoE A–C all have to be LOW; or
	• WoE B is a low rating

2.3.4 Synthesis of evidence

The synthesis has attempted to bring together the findings of the individual in-depth studies so as to enable the drawing of tentative conclusions and recommendations. It was agreed that for our audience and purpose the most appropriate synthesis would take the form of a structured narrative describing any overall, cross-study patterns or themes that were detected in the characteristics of our individual studies and in their findings. Themes were derived from those studies that had been subjected to the most rigorous interrogation using the EPPI-Centre data-extraction tool.

2.3.5 In-depth review: quality-assurance process

As quality-assurance, each study was independently reviewed and data-extracted by two different members of the review team or a member of the review team and the EPPI-Centre link person. Only when the independent in-depth analysis of the studies was completed did each internal pair of reviewers meet to isolate and resolve any differences of opinion and interpretation.

3. IDENTIFICATION AND DESCRIPTION OF STUDIES: RESULTS

This chapter describes how the searches produced the potential studies for inclusion in the review and outlines how the initial collection of studies was pruned to produce those that form the basis of the descriptive map.

3.1 Studies included from searching and screening

Figure 3.1 summarises the filtering of papers from searching through systematic map to final synthesis.

Papers (N=1,845) were identified for two-stage screening from electronic searching. An additional 52 studies were identified from handsearching allowing immediate screening.

The database origins of 2,095 papers identified for screening (including duplicates) are shown in Figure 3.2.

Key to Figure 3.1

Stage 1 Criteria	
1	Not focused on special educational needs
2	Not conducted in mainstream classroom
3	Not concerned with pedagogical approaches
4	Not indicating pupils outcomes
5	Not all or part of 7-14 year age range
6	Not empirical or systematic review
7	Not written in English
8	Not produced or published after 1994
Stage 2 Criteria	
1	Not focus on peer group interactive pedagogical approach
2	Not conducted by classroom teacher without necessitating additional support staff
3	Not academic and/or social interaction outcomes

Figure 3.1: Filtering of papers from searching to map to synthesis

1. Identification of potential studies

Two-stage screening: Papers identified where there is not immediate screening, e.g. electronic searching
N =2,095

Duplicate references excluded
N =250

Criterion 1:
S1 N=163
S2 N=13

Criterion 2:
S1 N=195
S2 N=26

Criterion 3:
S1 N=453
S2 N=36

Criterion 4:
S1 N=118
S2 N=54

Criterion 5:
S1 N=62
S2 N=4

Criterion 6:
S1 N=164
S2 N=102

Criterion 8:
S1 N=0
S2 N=3

Criterion 7:
S1 N=1
S2 N=0

One-stage screening: papers identified in ways that allow immediate screening, e.g. handsearching
N = 25

Abstracts and titles screened
S1 N=1845
S2 N=689

Papers excluded
Screen 1
N =1,156
Screen 2
N=238

Duplicate references excluded
N = 26

2. Application of inclusion/ exclusion criteria

Potential includes
N =450

Papers not obtained
N = 64

Criterion 1:
N = 6

Criterion 2:
N = 33

Criterion 3:
N = 96

Criterion 4:
N = 63

Criterion 5:
N = 17

Criterion 6:
N = 100 (107 studies)

Criterion 7:
N = 0

Criterion 8:
N = 0

Full document screened
N = 386 papers
(393 studies)

Duplicate reports on same study
N = 3

Excluded
Papers N = 315
(Studies N=322)

3. Characterisation

Systematic map
Papers/Studies included
N = 68

In map but excluded from in-depth review
N = 58
IDC1 N=46
IDC 2 N=9
IDC 3 N=3

4. In-depth review

In-depth review
Papers/Studies included
N = 10

KEY S1 - first screening S2 - second screening
IDC - in-depth criterion

Figure 3.2: Database origins
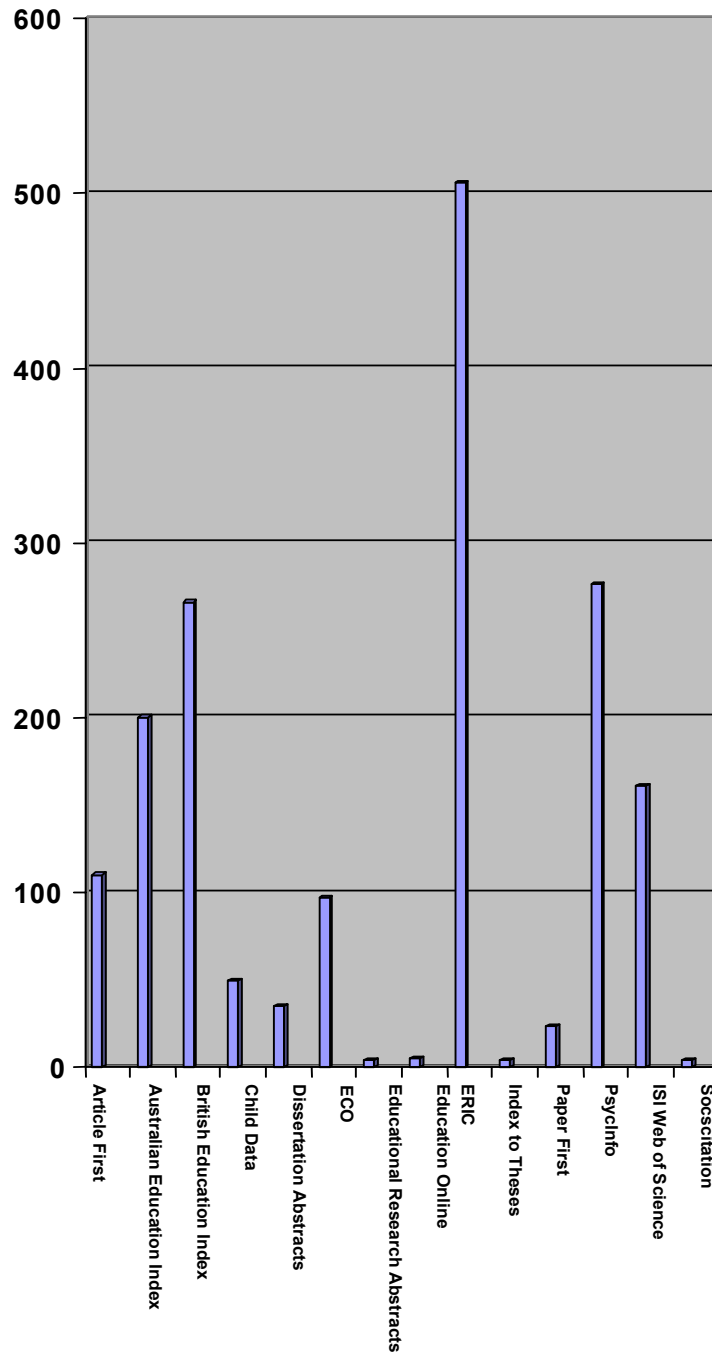
The bibliographic data were imported into the first database (EndNote 1) and duplicates were excluded. Duplicates were removed first where the titles were identical and duplicates were either identified by EndNote, or by hand when a further 26 duplicates were identified. The items with the least information were removed and so there is a biasing effect, implying some databases were more productive than they turned out to be when they had full abstracts. (See Appendix 2.2 for details of the search strategy.)

Exclusion criteria (see Appendix 2.1) were applied to 52 one-stage screening items and to the titles and abstracts of 1,845 reports. The one-stage screening led to the exclusion of 27 items with 25 items remaining. Screening of the titles and abstracts led to the exclusion of 1,156 reports (see Table 3.1) and a remaining 683 reports which, on first screening, were considered to have satisfied the criteria for inclusion in the review and for entry into the second database, EndNote 2. Of the total of 1,156 reports excluded, the bases for the exclusions are set out in the table below. For each item only one exclusion criterion was applied; that is, the highest in the hierarchy of criteria. When the two independent screeners disagreed, the resolution meant that the criterion lower down the hierarchy and a safer basis for exclusion was selected.

Table 3.1: Exclusions at first stage

Exclusion criteria	Number	Approx. per cent
1. Not focused on pupils who experience special educational needs of some kind	163	14
2. Not conducted in mainstream classrooms	195	17
3. Not concerned with pedagogical approaches	453	39
4. Not indicating pupil outcomes	118	10
5. Not concerned with all or part of the 7–14 age range	62	5
6. Descriptions, development of methodology or reviews other than systematic reviews	164	14
7. Not written in English	1	
8. Not produced or published in or after 1994	0	
Total	*1,156*	

In a second stage of screening of the titles and abstracts, the exclusion criteria were re-applied to those reports which remained and where there had been disagreement between the two screeners, where inclusion had been necessitated by lack of information to exclude, or where it was found we were too generous in the first screening. This second stage of screening resulted in a further 238 reports being excluded on the bases shown in Table 3.2.

Table 3.2: Exclusions at second stage

Exclusion criteria	Number	Approx. per cent
1. Not focused on pupils who experience special educational needs of some kind	13	6
2. Not conducted in mainstream classrooms	26	11
3. Not concerned with pedagogical approaches	36	15
4. Not indicating pupil outcomes	54	23
5. Not concerned with all or part of the 7–14 age range	4	2
6. Descriptions, development of methodology or reviews other than systematic reviews	102	43
7. Not written in English	0	
8. Not produced or published in or after 1994	3	1
Total	*238*	

After filtering through these stages, the potential number of studies for inclusion in the descriptive map was 450. These were entered into a third database (EndNote 3). A cut-off date of 31 March 2004 was set for retrieval of the full documents for screening. Of these 450 full studies sought for screening, 64 were not obtained by the cut-off date. This meant that, although we had not set out to exclude theses, for example, they were not included by default. As 75% of the full documents screened were excluded, it could be postulated that approximately 20 potential studies for the map were missing. The list of material documents that were not obtained for screening can be found in Appendix 3.1. At the third stage of screening, 383 full documents were screened, again using the same criteria but now applied to full readings of the studies. This resulted in a total of 315 studies being excluded; the details of the exclusions and the bases for such exclusions are set out in the Table 3.3.

Table 3.3: Exclusion of full documents

Exclusion criteria	Number	Per cent
1. Not focused on pupils who experience special educational needs of some kind	6	3
2. Not conducted in mainstream classrooms	33	10
3. Not concerned with pedagogical approaches	96	31
4. Not indicating pupil outcomes	63	20
5. Not concerned with all or part of the 7–14 age range	17	5
6. Descriptions, development of methodology or reviews other than systematic reviews	100	32
7. Not written in English	0	
8. Not produced or published in or after 1994	0	
Total	*315*	

Exclusions at the titles and abstract stage as well as further exclusions of full studies together with the unavailability of some studies meant that EndNote 3 now contained 68 studies. These 68 included studies constituted the data for the first mapping exercise (see Chapter 6).

The series of 'sieves' through which the initial collection of potentially useful studies was filtered is summarised in the flowchart set out in Figure 3.1.

3.2 Characteristics of the included studies (systematic map)

3.2.1 Database origins

The graph (Figure 3.3) summarises the electronic database origins of the 63 studies which were included in the descriptive map and not identified through handsearching. Although originally studies may have been identified in more than one database, they were downloaded to the EndNote database from the database supplying the most information. This means that, while the majority of studies in the map are recorded as being found in PsycInfo, other databases have suffered in terms of representation from this biasing effect.

Figure 3.3: Database origins of studies in map
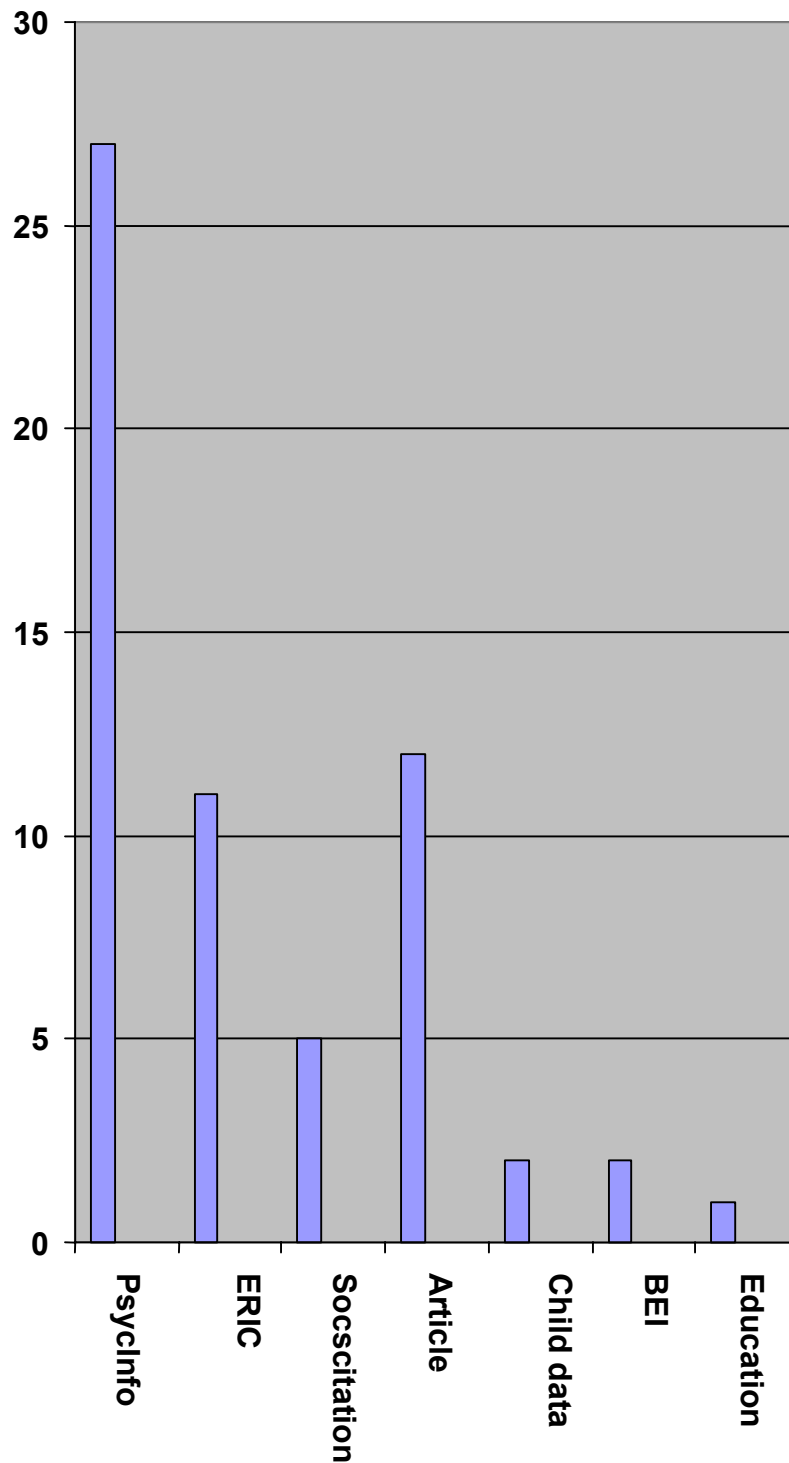
3.2.2 Study type

The descriptive map was generated through the EPPI-Centre process of keywording: both the EPPI-Centre core keywording strategy and a review specific keywording strategy were applied to the studies.

The graph below (Figure 3.4) shows the pattern of the 68 studies by study type. The methodological study type keywords were applied such that the keyword furthest along the hierarchy was applied (see Appendix 2.4). Thus evaluation studies are likely to involve some exploration of relationships, but exploration of relationships studies will not be evaluative.

Figure 3.4: Study type (N=68 studies)
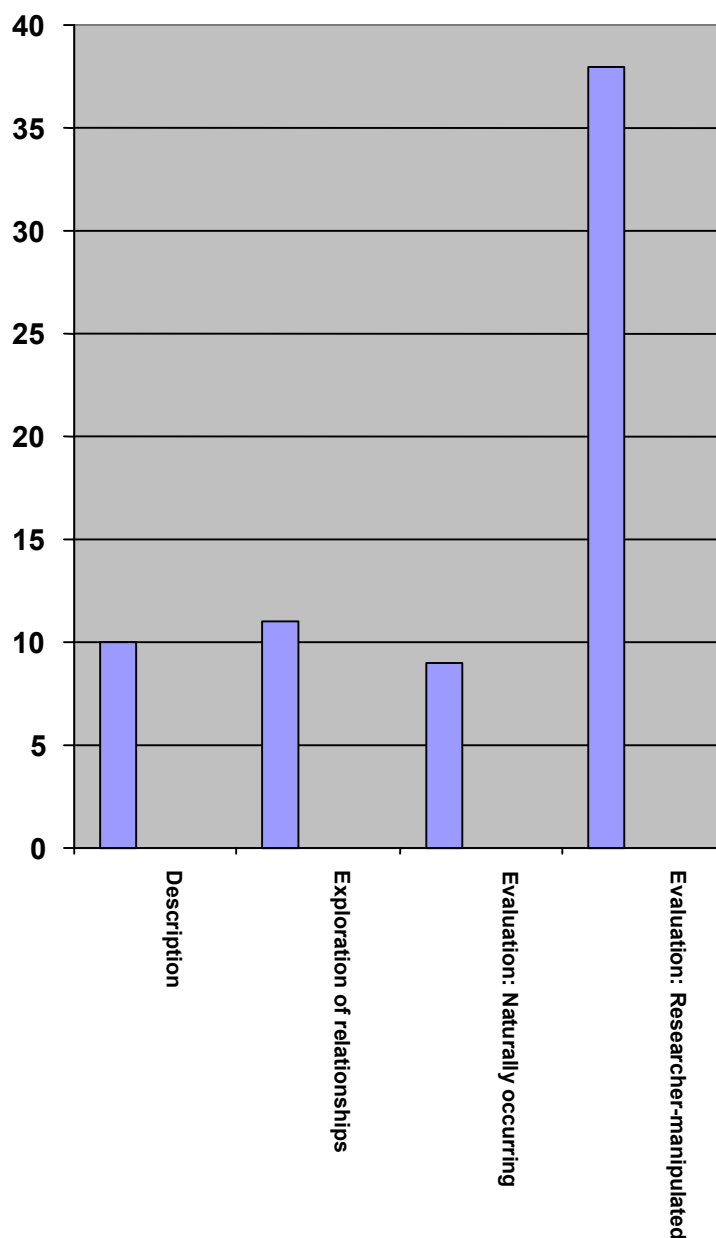
Among the evaluations, there are 11 controlled trials, three of which are randomised controlled trials.

3.2.3 National contexts

The pie chart below (Figure 3.5) sets out the countries in which the 68 included studies were carried out. This was not always explicitly stated and, in some

instances, reviewer judgement was used to infer the country from the researchers' university base and other contextual clues. The categories are mutually exclusive in that no studies were conducted in more that one country. The USA is clearly predominant, accounting for 80% of the studies included in the map.

Figure 3.5: National contexts (N=68 studies)
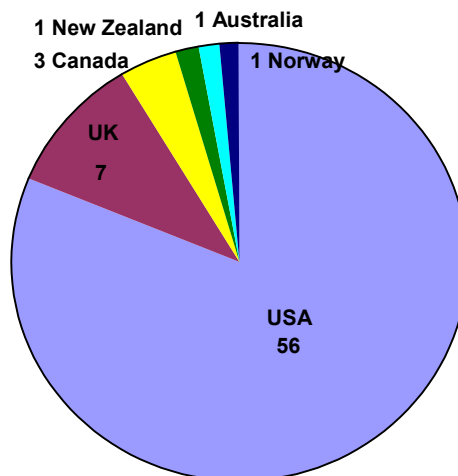
National context and study type were related as shown in Table 3.3. UK studies are spread across the study types, whereas in the USA, researcher-manipulated evaluations are more than four times as common as any other single study type. One each of the 11 controlled trials is from England, New Zealand and Canada, and the remainder are from the USA.

Table 3.3: Study type by country (N=68 studies)

Country	Description	Exploration of relationships	Evaluation: Naturally occurring	Evaluation: Researcher-manipulated
USA	8	6	7	34
UK	2	2	1	2
Canada	2			1
New Zealand				1
Australia		1		
Norway		1		

3.2.4 Curriculum focus

Figure 3.6 illustrates the curriculum focus of the various included studies. As can be seen, approximately one-third of the studies is not concerned with the curriculum, and a further 16% are not concerned with particular curriculum subjects. Of the curriculum subjects, literacy, mathematics and science dominate. (Interestingly, PE is also dominant in the wider collection of studies identified but these were excluded as either not having outcomes or not being empirical

studies; much is written about inclusion in PE but this is not based on research evidence). The curriculum keywords are not mutually exclusive and 91 keywords were applied to the 68 studies.

Figure 3.6: Curriculum focus (N=68 studies)
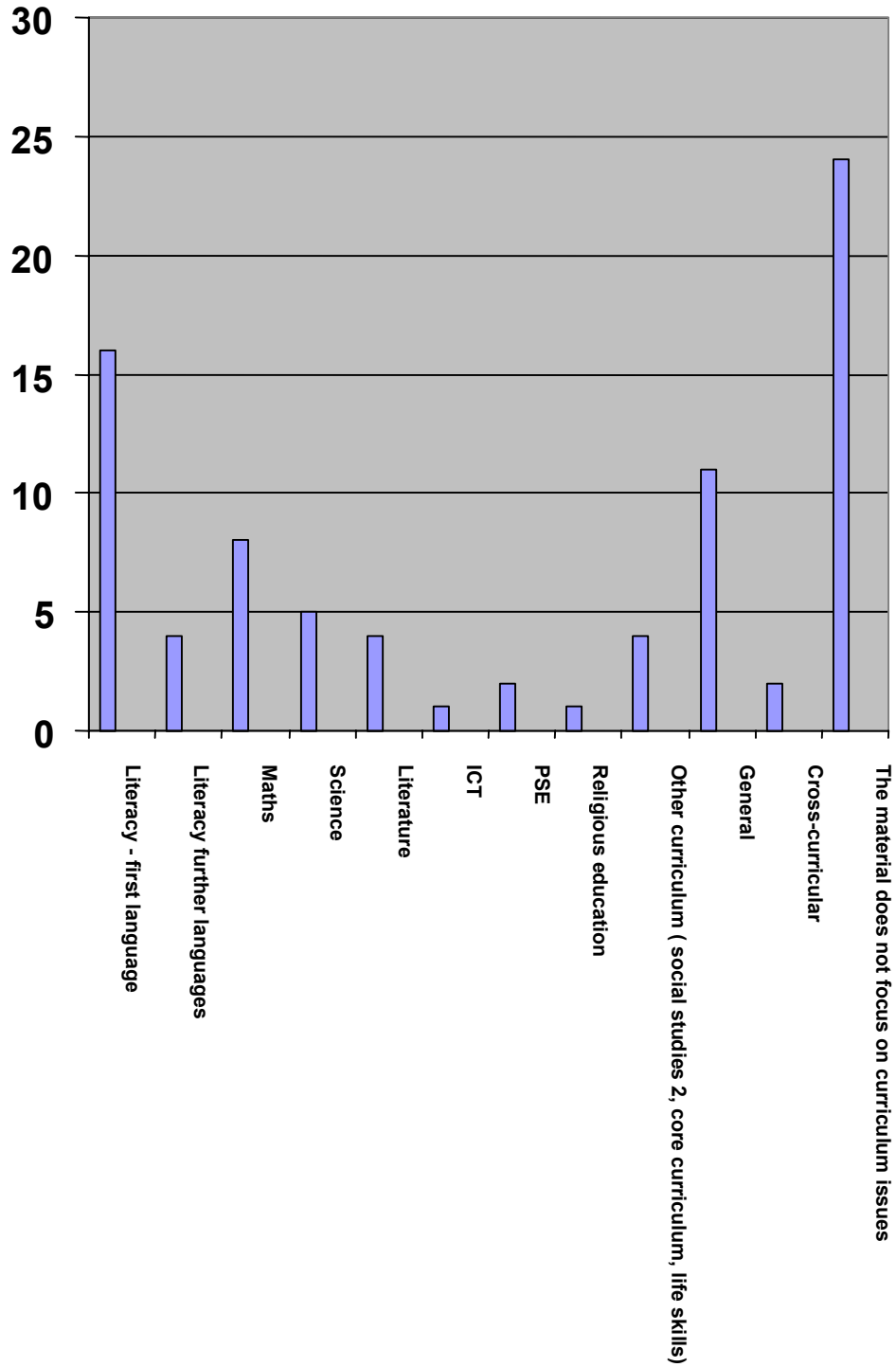
3.2.5 Context of the studies

It is commonly asserted that inclusive education is easier in primary education where gaps between chronological age and performance are smaller and where outcome measures have less influence. The descriptive map shows that twice as many studies were conducted in primary/elementary schools as in secondary/high schools. Whether or not inclusive education is easier to achieve in the primary sector, the research evidence about successful inclusive teaching is greater, as illustrated in Figure 3.7.

Figure 3.7: Education setting (N=68 studies)
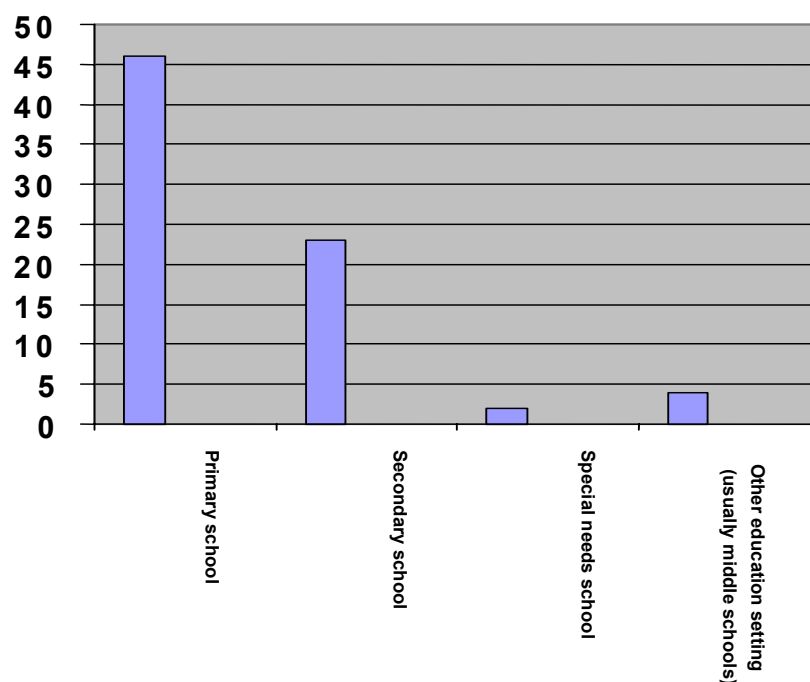
The categories are not mutually exclusive and in some studies the teaching intervention began in special contexts and moved to the mainstream; hence 75 keywords were applied to 68 studies.

3.2.6 Gender of the pupils

Most studies report on pedagogical approaches used with both genders, but in the single gender studies (often single case studies) boys dominate (see Figure 3.8). This is unsurprising, given the gender differences in special educational provision (Benjamin, 2003). The categories are mutually exclusive, hence 68 keywords were applied to 68 studies.

Figure 3.8: Gender of the target pupils (N=68 studies)
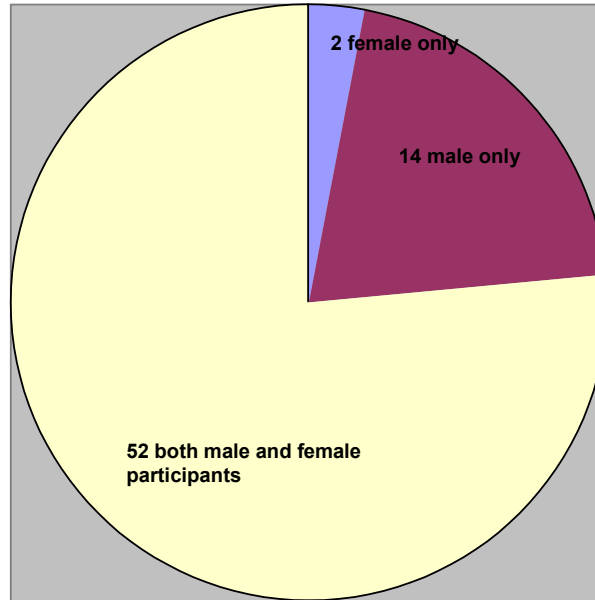
3.2.7 Aim of pedagogical approach

The included studies were keyworded for the aim(s) of the pedagogical approach studied. The categories could be used in combination and the combinations are shown in Table 3.4. In total, 50 were aimed at raising academic attainment; 38 were aimed at enhancing social interaction/involvement; and 20 were aimed at improving behaviour.

Table 3.4: Aims of the pedagogical approach

Aims of pedagogical approach	Number of studies (total = 68)
To raise academic attainment	18
To enhance social interaction/involvement	9
To improve behaviour	5
To raise academic attainment and social interaction/involvement	20
To raise academic attainment and improve behaviour	6
To enhance social interaction/involvement and improve behaviour	3
Academic, social and behaviour	6
Other (change attitudes, enhance inclusion)	2

Codes are not mutually exclusive as approaches could have more than one aim

3.2.8 Outcome of pedagogical approach

The aims of the pedagogical approach can be compared with the outcomes identified. The pattern of outcomes are summarised in Table 3.5. In total, 37 studies report academic outcomes, 36 social outcomes and 21 behavioural outcomes.

Table 3.5: Outcomes of the pedagogical approach

Outcome of pedagogical approach	Number of studies (total 68)
(Raised) academic attainment	10
(Enhanced) social interaction/involvement	9
(Improved) behaviour	3
(Raised) academic attainment and (enhanced) social interaction/involvement	15
(Raised) academic attainment and (improved) behaviour	6
(Enhanced) social interaction/involvement and (improved) behaviour	6
Academic, social and behaviour	6
Mixed positive and negative outcomes	7
Other (including null or negative outcomes)	14

Codes are not mutually exclusive as approaches could have more than one outcome

3.2.9 Who judges outcomes?

The team were also interested in who judged the outcomes. This is usually the researchers themselves or the teachers involved, but the team were keen to identify the studies in which pupils actively participated in judging the outcomes, as they might be regarded as the best judges of their inclusion (Cullingford, 2004). The pattern of outcomes is shown in Figure 3.9; the categories are not mutually exclusive and 131 keywords were applied to 68 studies. Predictably, researchers dominate, but pupils were involved in one-third of the studies (that is, either the pupils whose outcomes were judged or their peers).

Figure 3.9: Who judges the outcomes? (N=68 studies)
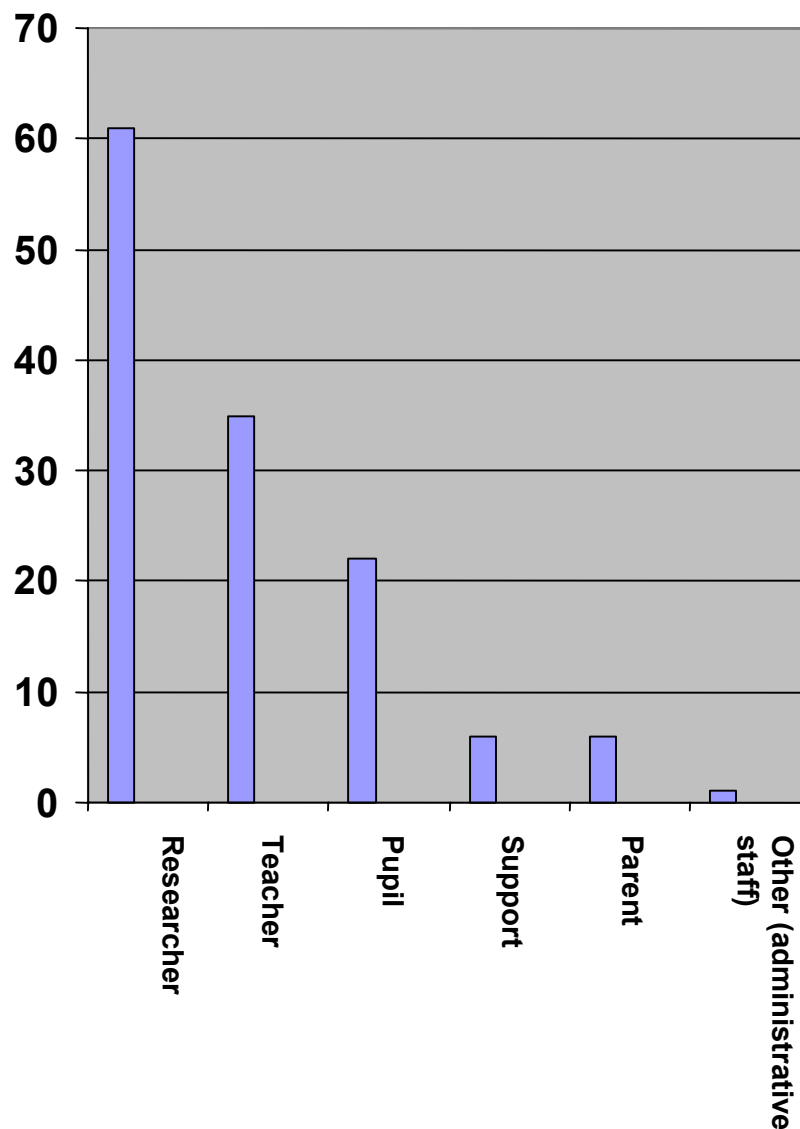
3.2.10 Target group

Some of the pedagogical approaches were aimed at all pupils and some were targeted at pupils with particular special educational needs, most often learning

difficulties (Figure 3.10). The pattern across the studies is shown in Figure 3.10; the categories are not mutually exclusive and 125 keywords were applied to 68 studies.

Figure 3.10: Target group for the teaching approach (N=68 studies)
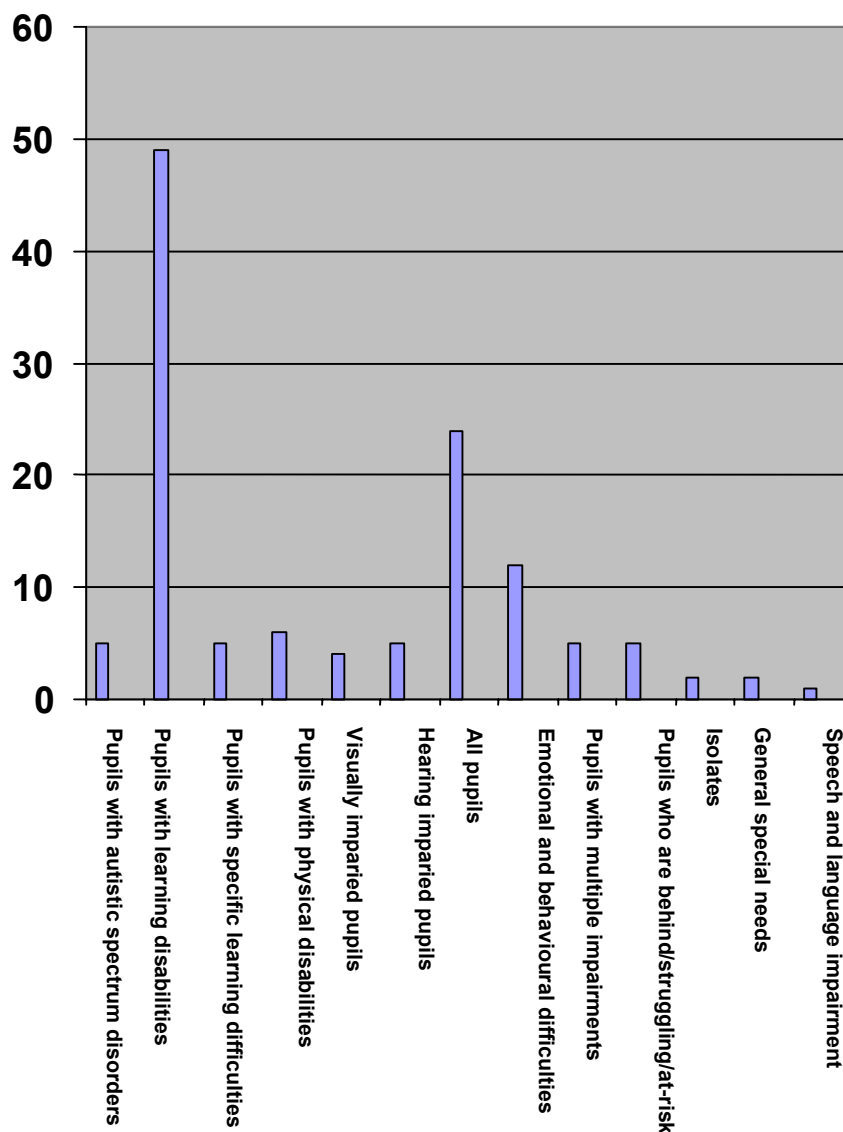
3.2.11 Staff involved

Various keywording combinations were possible for who did the teaching. Almost two-thirds of the studies report pedagogical approaches adopted by ordinary mainstream teachers, and almost half utilised support staff or involved a collaborative model. The pattern of staff involved is illustrated in Figure 3.11; the categories are not mutually exclusive and 111 keywords were applied to 68 studies.

Figure 3.11: Who does the teaching? (N=68 studies)
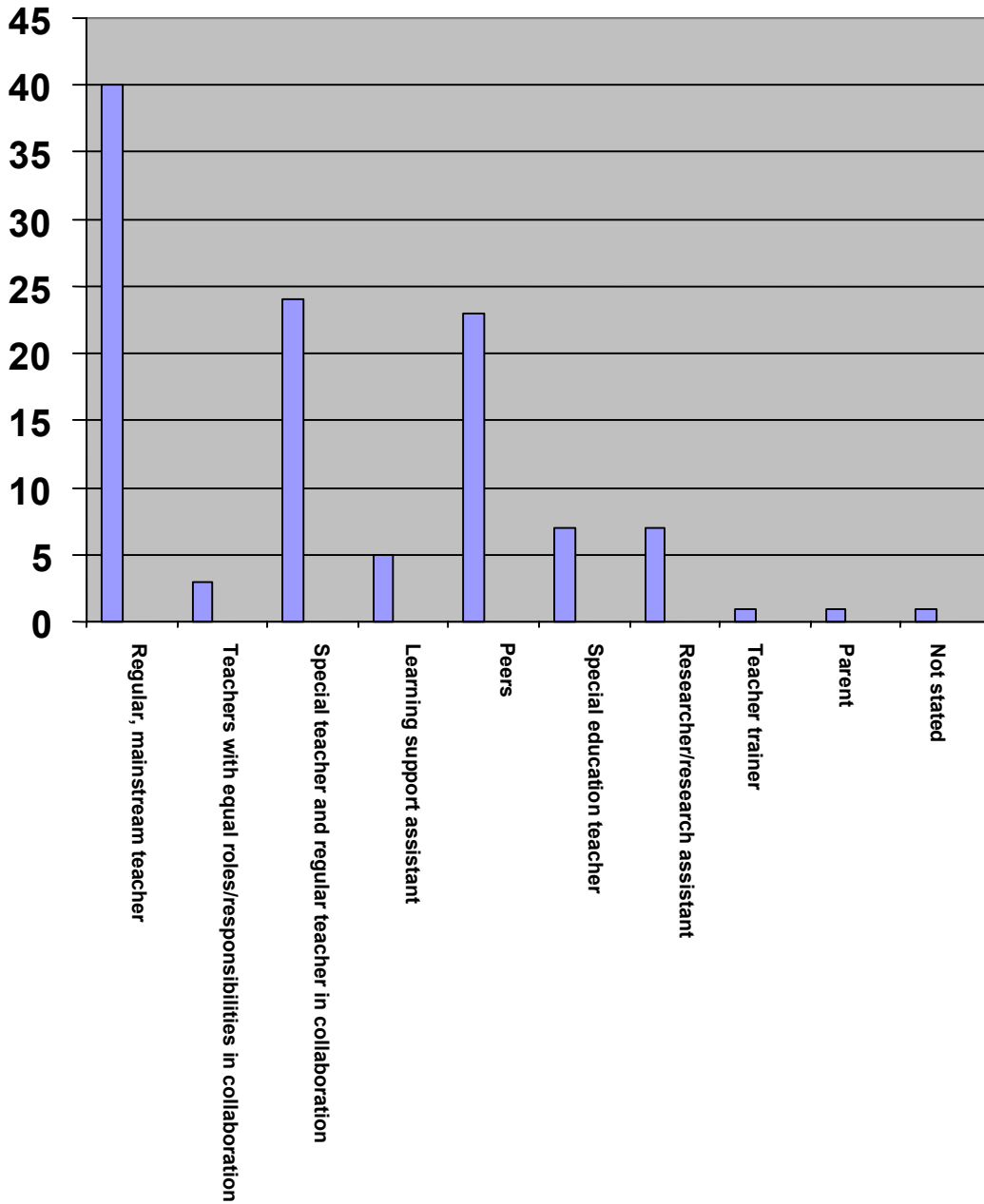
3.2.12 Nature of the pedagogical approach

The 68 studies were keyworded according to the nature of the pedagogical approach studied and some of the studies report on a combination of several approaches, hence the categories are not mutually exclusive. The outcome of this keywording is illustrated in Figure 3.12.

Figure 3.12: Nature of the pedagogical approach (N=68 studies)
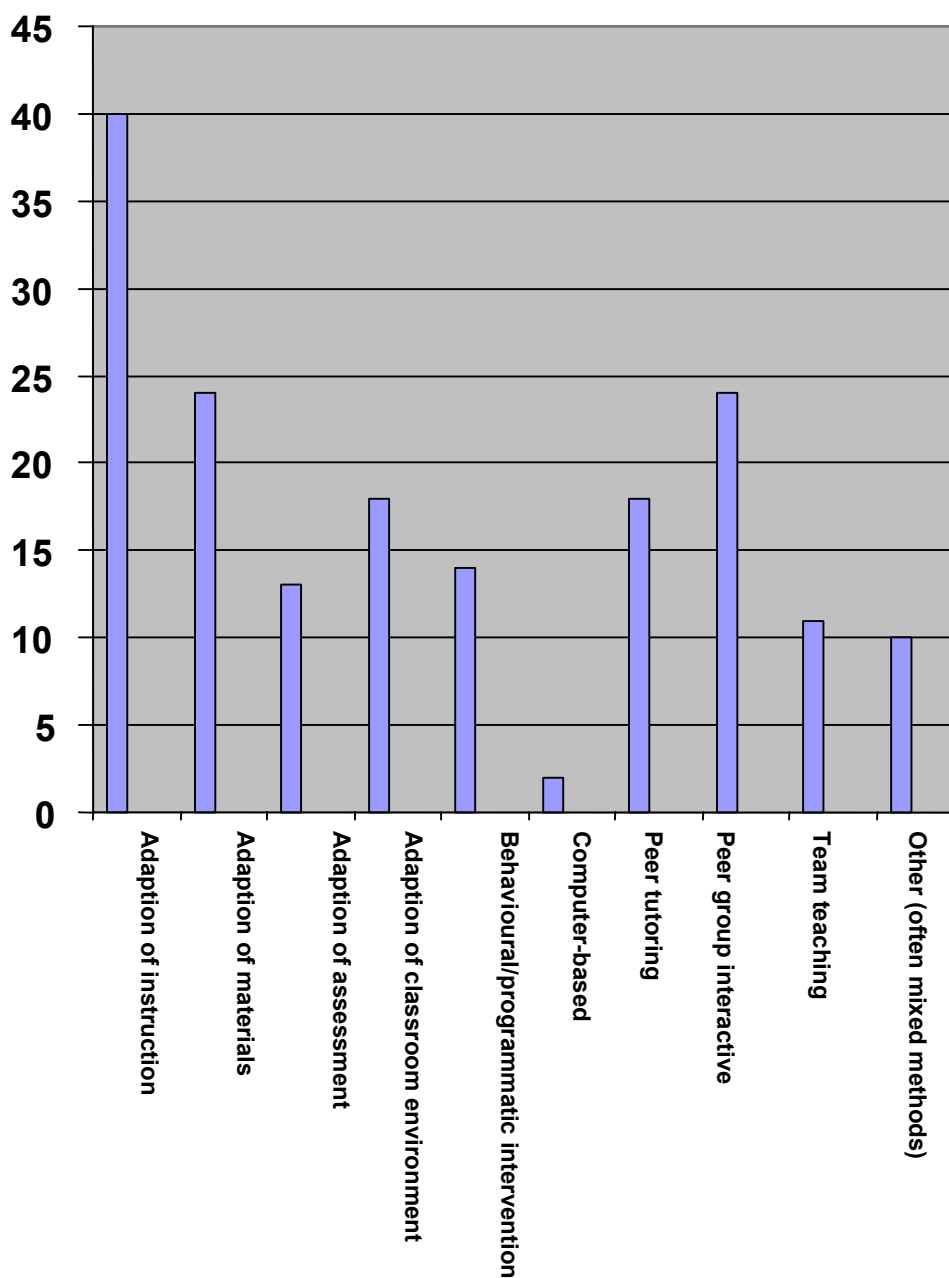
Keywording studies for adaptation of instruction meant that studies were identified where the mode of delivery or teaching style was adapted to enable the participation of pupils with special educational needs. This sometimes overlapped with adaptation of the learning materials themselves or adaptation of the physical or social classroom environment or means of assessment.

3.3. Identifying and describing studies: quality-assurance results

A rigorous approach to the quality-assurance for the identification and description of studies in the systematic map was taken in that two members of the review team independently screened and keyworded the studies. This means that at no stage did lone researchers make decisions. Our colleague from the EPPI-Centre also played a crucial role in helping to assure quality within the processes of (a) identifying studies of potential importance and (b) applying inclusion and exclusion criteria that would help highlight those which were important for answering the review question.

In the application of exclusion/inclusion criteria to the collection of titles and abstracts, the measure of inter-rater reliability between the two members of the review team was good (Cohen's Kappa 0.62). The measure was conducted early in the process before the two review members were well practised and the agreement score was likely to improve. We decided, however, to screen all the titles and abstracts independently, rather than just double-screen a sample, thus providing maximum rigour and confidence in the decisions. There was 80% agreement for the two reviewers across the set of titles and abstracts. The kappa statistic for inter-rater reliability between each of the review members and our EPPI-Centre colleague was lower but fair (Cohen's Kappa 0.35). This difference is most plausibly explained by the difference in expert knowledge of the subject matter between the review team members and our EPPI-Centre colleague.

The full documents were also independently screened by two reviewers, with 10 studies also reviewed by the EPPI-Centre colleague. Both the two independent reviewers and the EPPI-Centre colleague had an 80% agreement rate on which studies to include. The two reviewers looked at any disagreements again together and reconciled the difference.

Keywording involved pairs of independent reviewers from across the review team. Again there was very close agreement in the keywording of the pairs of review team members and also between our moderated keywording and that of our EPPI-Centre colleague. Differences were most likely to occur in keywording study type. This led to a detailed discussion of when an evaluation is of a naturally occurring intervention and when it is researcher-manipulated; any difference of judgement was resolved through moderation.

4. IN-DEPTH REVIEW: RESULTS

This chapter provides further information on the studies included in the in-depth review. The studies are categorised and narrative descriptions of each of the studies are presented. The chapter then synthesises the evidence. The team also describe the process of assuring the quality of results and, in the final section, refer to the actual involvement of users in the review.

4.1 Selecting studies for in-depth review

It was important to select from the map of 68 studies those studies for in-depth review that are of the most direct relevance to teachers in training and newly qualified teachers as well as training providers. As outlined in Chapter 2, discussion took place between members of the review team and members of the external groups about which cluster of studies could provide evidence of strategies that all teachers can use in mainstream classrooms to in order to include pupils with special educational needs. This discussion culminated in consensus that peer group interactive approaches, particularly those that go beyond simple peer tutoring, were of particular interest for their relevance to the teachers concerned.

Moreover, there might be problems implementing any teaching approach, technique or programme requiring additional or special resourcing, be it human or physical. Therefore it was important that only those studies should be included which focus on those personnel who would by necessity be available in every classroom: that is, the mainstream teacher and pupils' own peers. Lastly, as 'inclusion' comprises both academic and social or behavioural aspects, the teaching approaches in the studies for the in-depth review needed to report on both academic and social or behavioural matters. A focus on peer group interactive approaches had potential to be helpful in terms of our original subsidiary questions in telling us about the classroom environments that teachers and pupils find conducive to learning.

Two related dimensions emerged from discussion of what it was we wanted to learn from such studies: the dimension of evidence of the effectiveness of these approaches and the dimension of what they involved. Thus, the questions for the in-depth review became:

Question (a): Does a pedagogy involving a peer group interactive approach effectively include children with SEN in mainstream classrooms?

Question (b): How do mainstream classroom teachers enhance the academic attainment and social inclusion of children with special educational needs through peer group interactions?

On the above basis, inclusion and exclusion criteria on the scope of the studies for the in-depth review were drawn up and applied as follows:

The in-depth review *includes* those studies that meet *all* the following criteria:

A systematic review of pedagogical approaches that can effectively include children with special   39
educational needs in mainstream classrooms with a particular focus on peer group interactive
approaches

1. Include a focus on a peer group interactive pedagogical approach beyond peer tutoring or behavioural prompting

2. Are conducted by mainstream classroom teachers without necessitating additional staff support

3. Include an indication of academic and/or social interaction or involvement outcomes measured through systematic data gathering

Studies would be *excluded* if they meet *one* of the following exclusion criteria:

1. Not focused on a peer group interactive pedagogical approach beyond peer tutoring or behavioural prompting

2. Not conducted by mainstream classroom teachers without necessitating additional staff support

3. Not giving an indication of academic and social interaction or involvement outcomes measured through systematic data gathering

The review-specific keywording asked 'Who does the teaching?' and so studies involving primarily the mainstream teacher had already been identified. Nonetheless, for rigour, the criteria were applied by two independent reviewers to all 68 studies in the descriptive map. From these, 46 studies were excluded on criterion 1, nine on criterion 2 and three on criterion 3. This left the following 10 studies which satisfied requirements for inclusion in the in-depth review:

- Beaumont CJ (1999) Dilemmas of peer assistance in a bilingual full inclusion classroom. *Elementary School Journal* **99:** 233–254.

- Blum HT (2002) Literature circles: a tool for self-determination in one middle school inclusive classroom. *Remedial and Special Education* **23:** 99–108.

- Cushing LS (1997) Disentangling the effect of curricular revision and social grouping within cooperative learning arrangements. *Focus on Autism and Other Developmental Disabilities* **12:** 231–240.

- Frederickson N (2002) Utilizing the classroom peer group to address children's social needs: an evaluation of the Circle of Friends intervention approach. *Journal of Special Education* **36:** 234–245.

- Goatley VJ (1996) The participation of a student identified as learning disabled in a regular education book club: the case of Stark. *Reading and Writing Quarterly* **12:** 195–214.

- Palincsar AS, Magnusson KMC, Cutter J (2001) Making science accessible to all: results of a design experiment in inclusive classrooms. *Learning Disability Quarterly* **24:** 15–32.

- Salisbury CL, Gallucci C, Palombard MM, Peck CA (1995) Strategies that promote social relations among elementary students with and without severe disabilities in inclusive schools. *Exceptional Children* **62:** 125–137.

- Stevens RJ, Slavin RE (1995a) Effects of a cooperative learning approach in reading and writing on academically handicapped and non-handicapped students. *Elementary School Journal* **95:** 241–262.

- Stevens RJ, Slavin RE (1995b) The cooperative elementary school: effects on students' achievement, attitudes and social relations. *American Educational Research Journal* **32:** 321–351.

- Summey HK (1997) An exploratory study of mainstreamed seventh graders' perceptions of an inclusive approach to instruction. *Remedial and Special Education* **18:** 36–45.

4.2 Further details of studies included in the in-depth review

4.2.1 Topic of research

Not unexpectedly, the topic of research uniting the studies in the in-depth review is 'teaching and learning', identified for all studies other than the one by Frederickson. Other foci for the research were also identified as shown in Table 4.1. Teaching and learning is also the biggest category of focus in the descriptive map of 68 studies, 52 of which focus on teaching and learning, with classroom management and curriculum also featuring strongly (23 of each).

Table 4.1: Research topic focus for studies in the in-depth review (N=10)

Research topic	Number	Studies (Identified by author)
Classroom management	3	Beaumont (1999); Blum (2002); Salisbury *et al.* (1995); Stevens and Slavin (1995b)
Curriculum	5	Blum (2002); Cushing (1997); Goatley (1996); Palincsar *et al.* (2001); Stevens and Slavin (1995b)
Organisation and management	3	Palincsar *et al.* (2001); Salisbury *et al.* (1995); Stevens and Slavin (1995b)
Policy	1	Salisbury *et al.* (1995)
Teaching and learning	9	All studies except for Frederickson (2002)
Other – 'social acceptance'	1	Frederickson (2002)

4.2.2 Curriculum area

Most studies (six) focused on the literacy curriculum as shown in Table 4.2.

Table 4.2: Curriculum focus for studies in the in-depth review (N=10)

Curriculum area	Number	Studies (identified by author)
Cross-curricular	2	Salisbury *et al.* (1995); Stevens and Slavin (1995b)
Literacy – first languages	7	Blum (2002); Cushing (1997); Goatley (1996); Stevens and Slavin (1995a; 1995b); Summey (1997)

Literature	2	Goatley (1996); Summey (1997)
Maths	1	Stevens and Slavin (1995b)
Science	1	Palincsar *et al.* (2001)
None	1	Beaumont (1999)

Literacy is also the dominant curriculum area in the descriptive map, accounting for 20 studies, although 24 studies do not focus on curriculum issues.

4.2.3 Educational setting

All the studies except for one (Cushing) took place in the primary or middle school years (see Table 4.3). In the descriptive map, twice as many studies have a primary context as secondary context (46 compared with 23). This implies that the focusing in on peer group interactive approaches has steered the in-depth review toward the primary setting.

Table 4.3: Educational setting of studies in the in-depth review (N=10)

Setting	Number	Studies (identified by author)
Primary school	7	Beaumont (1999); Frederickson (2002); Goatley (1996); Palincsar *et al.* (2001); Salisbury *et al.* (1995); Stevens and Slavin (1995a; 1995b)
Middle school	2	Blum (2002); Summey (1997)
Secondary ('intermediate') school	1	Cushing (1997)

4.2.4 National context

As in the descriptive map, the national context for the studies is dominated by the USA. With the exception of one English study (Frederickson, 2002), the others were conducted in the USA (as stated in six studies and inferred in three).

4.2.5 Research design

Eight of the 10 studies are evaluations, mostly researcher-manipulated. Table 4.4 shows the pattern of study types. In the descriptive map, just over half the studies are evaluations, again mostly researcher-manipulated.

Table 4.4: Study type for studies in the in-depth review (N=10)

Type of design	Number	Studies (identified by author)

B. Exploration of relationships	2	Beaumont (1999); Salisbury *et al.* (1995)
Ca. Evaluation: Naturally occurring	2	Goatley (1996); Palincsar *et al.* (2001)
Cb. Evaluation: Researcher-manipulated	6	Blum (2002); Cushing (1997); Frederickson (2002); Stevens and Slavin (1995a; 1995b); Summey (1997)

4.2.6 Outline of all the studies included in the in-depth review

We now present an outline of all the studies included in the in-depth review. This should be read in conjunction with Appendix 4.1 which summarises these studies. For each study we indicate the context, methodological approach and key findings or conclusions. We also indicate the reviewers' judgements on important aspects of the studies. Following the outlines, we discuss the reviewers' final ratings of trustworthiness of the researchers' approach and conclusions, and the weight of evidence given for each. This leads to a discussion of which studies are excluded from the final synthesis of evidence and why.

4.2.6.1 Beaumont (1999) Dilemmas of peer assistance in a bilingual full inclusion classroom

The context of Beaumont's work is 'a blended, inclusive classroom' in a primary school in the USA (West San Francisco Bay). The study was of 'spontaneous, unstructured peer assistance interactions' between 22 general education and 11 students previously in special education. The focus was on small-group and independent work periods and, in particular, on three students with a special school background. Beaumont was interested in the relationship 'between students' social concerns and their participation in and success with academic tasks' (p237). She makes claims to representativeness in that, 'the students reflected the demographic characteristics of the school and neighbourhood in which the classroom was located' and the three focal students were chosen 'with a variety of characteristics in order to identify features of inclusive environments that might be applicable to many different students' (p238).

Data were collected and analysed both simultaneously and sequentially using a constant-comparative method to generate categories, themes and hypotheses (Glaser and Strauss, 1967). Methods included 'both descriptive and reflective field notes' and 'weekly memos and interim summaries' (p241). Interactions were identified for future in-depth analysis framed by the questions: 'How did students and teachers view help in the classroom? What social and academic factors were involved in helping? Who helped who? Under what circumstances was help sought, given and received? Were consistent patterns evident in which students adopted teacher and learner roles? Was help effective?' (p241).

Beaumont concludes that social (inter)actions affect participation in curricular activities, teachers rely on peer assistance to supplement their instruction and students need skills to negotiate complex social relationships. She found that students with special needs offered help, which suggests they wanted to

establish themselves as equals, but that they themselves experienced less support in interactions than their peers. She suggests that teachers need to consider context and role when planning and need to understand, monitor and structure helping interactions; students need to learn how to make bids for attention, ask precise questions (for clarification, etc.) and how to offer help without criticism.

Beaumont's ethnographic approach means her interpretations are inherent to the findings. While rich, detailed data are presented to support conclusions, there was no checking with other coders, observers or the participants themselves. The reviewers judged the findings to be trustworthy, but the consequent recommendations for teacher behaviour to be an unproven, although likely, hypothesis.

The reviewers judged that the overall weight of evidence against question (a) was 'low' because the design did not allow for evaluation of effectiveness in any rigorous way. It was stronger for understanding how peer group interactions enhance attainment and inclusion, although it did not focus strongly on what the teacher does in this.

4.2.6.2 Blum (2002) Literature circles: a tool for self-determination in one middle school inclusive classroom

The context for Blum's study was an atypical middle school able to approach the curriculum in its own child-centred way. The study was about literature circles, which are 'small, temporary discussion groups composed of students who are reading the same story, poem, article or book.' (p101). The study aimed to determine their role 'in helping all students assess their own abilities' and in addressing the needs of disabled students (p102). It focused on measuring students' perceptions of their reading abilities (comprehension, abilities to remember and explain what they read) and the nature of students' involvement, depth of understanding and attitudes toward the discussion process.

Analysis of variance (ANOVA) was conducted on the students' self-assessments, comparing means for the target and wider groups before and after the semester of literature circles. Emergent themes from the interviews and anecdotal records were identified. Comparisons of scores applied to discussion rubrics were made to determine students' involvement in the literature circles.

Blum found that the students with special needs did have an understanding of the difficulties they faced as readers and that, prior to the literature circles, there were significant differences in their self-assessments and the group without special needs. After the literature circles, this significant difference disappeared in three out of four areas (self-assessment, remembering what they read and explaining what they read) but not in how they perceived their abilities in understanding what they read compared with the remainder of the class. The report includes a case study of one student who gained in confidence as a discussant and reader of literature.

The reviewers identified obvious shortcomings in the study: qualitative data were given for one student only without rationale given for his selection. There was no indication of the representativeness of these data. While interview and observational data were collected alongside the surveys, these are not reported in the paper. Possible confounding variables are not discussed. The reviewers conclude that insufficient detailed findings are reported to support all the conclusions claimed and insufficient information is given about research

methods. For these reasons, Blum's study is not deemed to have sufficient weight of evidence to be included in the final synthesis.

4.2.6.3 Cushing (1997) Disentangling the effect of curricular revision and social grouping within cooperative learning arrangements

The context for Cushing's study was an eighth-grade English class with 22 peers without disabilities and two students with moderate to severe disabilities in a suburban, intermediate school in Hawaii. Students were from 'culturally, economically and ethnically diverse backgrounds' (p233) and the two students with disabilities are described in detail. The study of cooperative learning aimed to compare two conditions in order to understand how the social grouping element and curricular revision components each affect classroom performance. 'The first condition … combined the social grouping of participants and revision of course materials. The second condition presented participants with the revised curriculum but removed the social grouping component' (p231). Previous studies had failed to compare the two directly.

The study comprised an ABABAB withdrawal design in which the two conditions were alternated on a weekly basis. 'Dependent variables included the percentage of time participants were actively engaged in classroom activities, weekly re-/post-test scores on the classroom curriculum, and the frequency and duration of social interactions between students with severe disabilities and their peers' (p 231). Data-collection methods include interview and observation (time-sampling of pupils' active engagement and event recording using a social interaction checklist). Data analysis processes are explicit. Care was taken to counterbalance and randomly determine times and order of observation, to include inter-observer agreement checks and to use a third judge for areas of disagreement in coding interview material.

Findings show greater improvement in weekly pre-/post-test scores when revised curriculum only (RCO) conditions occurred, but little systematic difference in active engagement or social interaction across the social group plus revised curriculum (SGRC) and RCO conditions. The educators preferred the SGRC condition and reported that students without disabilities did too.

Although the reviewers felt that the alternating conditions design could have been confusing or less than ideal for students, and therefore raised some ethical issues, the design was very appropriate for the research aim. The greatest threat came from the small sample size and possibility that the participants with disabilities could not be said to be typical of all students with disabilities. They judged that the trustworthiness of the approach and conclusions were high and that there was medium weight of evidence for questions (a) and (b).

4.2.6.4 Frederickson (2002) Utilizing the classroom peer group to address children's social needs: an evaluation of the Circle of Friends intervention approach

This pair of small-scale evaluation studies of an intervention to enhance social acceptance of classmates with special educational needs (emotional and behavioural difficulties) was conducted in the context of a primary classroom in England. It was designed to elicit systematic information on the impact of the Circle of Friends, measuring changes in social inclusion in play; children's self-perceptions of competence, acceptance and global self-worth; teachers' ratings of the same; and children's and teachers' perceptions of the classroom learning environment.

The research design comprised two phases: Phase 1, a between-group design, compared a randomly allocated 'treatment' with a 'control'; in Phase 2, the control group became the treatment group and within-group scores were analysed. Data were collected using published tests: Sociometric Rating Scale (Asher and Dodge, 1986), Self Perception Profile for Children (Harter, 1985), Teacher's Rating Scale of Child's Actual Behavior (Harter, 1985) and My Class Inventory (Fraser, 1982; Fraser and Fisher, 1986). Statistical analysis of differences between groups with post-intervention scores as the dependent variable and pre-intervention scores as the covariate in each analysis were used: analysis of covariance (ANCOVA) of differences between groups, ANOVAs for within-group (Phase 2).

Findings show that the Circle of Friends intervention had a positive impact on the social acceptance of the focus children in the perceptions of the classroom peer groups, but not on teachers' or focus children's perceptions, nor on the general ethos of the classroom learning environment. The small size of the sample limited the power of the statistical procedures and this, together with the variability in age of participants and the gender imbalance, limited the potential for generalising findings. Therefore Frederickson concludes that findings should be treated tentatively.

The reviewers noted that the small sample size and differences between who implemented the intervention in Phases 1 and 2 limited the potential for ruling out error and bias. The tentative nature of the conclusions reached by the author was deemed highly trustworthy. The weight of evidence for question (a) was judged to be medium-high and medium for question (b).

4.2.6.5 Goatley (1996) The participation of a student identified as learning disabled in a regular education book club: the case of Stark

The context for Goatley's study was a Grade 5 classroom in a neighbourhood elementary school in the USA. It focused on the book club, a literature-based reading programme with four components: reading, writing, instruction and large group discussion. The single case study addressed the progress in literacy acquisition and comprehension of text and in acquisition of social skills of one 'learning-disabled' student in a mainstream classroom.

Various types of data were triangulated: fieldnotes, videotapes of physical movements, facial expressions and non-verbal behaviours, audiotapes and transcripts of book club meetings, interviews with the student and his teacher, the teacher's lesson plan book, written questionnaires and the student's written work.

The student's levels of reading comprehension and writing improved; improved social skills in the classroom are also reported. Another finding of the study was the importance of teacher reflection and intervention to guide interactions and organise groupings.

The study was considered to be reasonably trustworthy in answering its own questions, and to have a medium weight of evidence for question (b). For question (a), however, weight of evidence was 'low' because this was a single case study in which not enough detail was given of the student's background, the degree to which he experienced difficulties in learning or their nature.

4.2.6.6 Palincsar et al. (2001) Making science accessible to all: results of a design experiment in inclusive classrooms

Palincsar *et al.*'s study was set in four upper-elementary heterogeneous inclusive classrooms and looked at guided inquiry science instruction. The study had two phases: the first phase aimed to 'investigate the engagement and learning of students identified as having learning disabilities and/or emotional impairments, as they participated in GIsML [guided inquiry supporting multiple literacies] instruction in inclusion classrooms' (p18); and the second aimed to examine the outcomes of GIsML instruction combined with teaching strategies developed out of Phase 1. Guided Inquiry is an approach to science teaching involving authentic activities and lots of opportunities to engage in higher order thinking. Students repeat cycles of investigation (first hand and second hand) to refine their thinking. The key cycles are engage, investigate, explain and report.

The research explored this approach with students with special needs, specifically the opportunities and challenges presented to them and their responses. It was concerned with how teachers can mediate students' participation to enhance their engagement and learning and the outcomes of 'advanced design and mediation of learning'? (p16). The authors describe their study as a 'design experiment, which refers in education to the engineering of innovative educational environments in which one simultaneously conducts experimental studies of teaching and learning over several iterations of the design of the environment' (p16). They report on two phases: first the observational phase, where the multiple data gathered were used to generate narrative case studies whose findings were used to generate advanced teaching strategies and gather observational, interview and artifactual data about these in Phase 2.

The sampling frame was a previously-established 'Community of Practice' network of primary teachers and university researchers, a 'Community of Practice'; all the fourth- and fifth-grade teachers' classes were chosen as sites for the study. All students participated, but within each class the students identified as having SEN were the primary subjects. Over 100 students were involved.

Data-collection methods include curriculum-based assessment; focus group discussion with participating teachers; interviews with identified children; observation; self-completion report or diary; and student artefacts.

The reviewers considered appropriate efforts were made to ensure reliability and validity of data-collection and analysis. 'Each case generated was examined for confirming and disconfirming evidence regarding the claims that were generated, and the evidence for each claim was noted' (p 20). Statistical analysis was carried out on the quantitative data gathered pre- and post-study.

Findings from Phase 1 show that participation of students with SEN was influenced by the nature and amount of appropriate assistance/intervention received. Poor writers participated more fully when helped to document their thoughts; students with SEN found it difficult to learn from large-group discussions without concrete support; one-to-one discussion with the teacher helped them to engage with learning, develop thought and rehearse for sharing. Given appropriate social and cognitive support, SEN students were able to participate and express understanding. Quantitative data show that students with SEN achieved significant learning gains in science by the end of Phase 2, as did the low-achieving and normally-achieving students. A key characteristic of the advanced teaching practices was identified as the addressing of access, both

access of SEN students to the instructional context and also access of teacher and peers to SEN student's thinking and reasoning. Palincsar *et al.* (2001) conclude that teachers need to have deep knowledge of subject matter and to engage in collaborative consideration of the subject-specific nature of instruction, which requires time and support. Moreover, students with SEN in inclusive classrooms also need social support, particularly in small-group activities.

Class teacher	Phase 1	Phase 2
Dunbar	Significant learning gains by identified students only p<0.0431	Significant learning gains by all groups of students
Jentzen	Significant learning gains only by 'normally-achieving' students p<0.0129	Significant learning gains by 'normally-achieving' and identified students
Lacey	Significant learning gains only by 'normally-achieving' students p<0.0277	Significant learning gains by low and 'normally-achieving' students
Lenowsky	Significant learning gains only by 'normally-achieving' students p<0.0045	Significant learning gains by low and 'normally-achieving' students

The reviewers did not identify any significant shortcomings in the study, although the complexity of the design intervention poses challenges with regard to replicability. Statistically, the small number of SEN students (17–19) make generalisability low, but practitioners in inclusive settings would be able to relate well to the study and in this sense (of case study methodology) its generalisability is quite high. The reviewers consider the researchers' conclusions are highly trustworthy and that the study offers medium weight of evidence for questions (a) and (b).

4.2.6.7 Salisbury et al. (1995) Strategies that promote social relations among elementary students with and without severe disabilities in inclusive schools

Salisbury *et al.*'s study was based in a US elementary school and aims 'to identify and examine effective practices/strategies' used 'to promote social relations among elementary students with and without severe disabilities' (p126). This is a case study conducted in two phases: first, interviewing and observing 10 teachers in two schools and, second, focus group interviews with those 10 teachers plus other teachers in their school. Analysis of data was based on inductive methods.

Generalisability of findings to other teachers who have students with severe disabilities in their class is somewhat assumed, but the small sample size and lack of experimental design is acknowledged, leading the authors to urge caution in interpretation and application of their conclusions (p 135).

The study found teachers actively facilitated social interactions, including examples of cooperative grouping, collaborative problem-solving, peer tutoring, the structuring of time and opportunity (pp132–133). The case study illustrates the development and utilisation of knowledge and awareness among students that promoted inclusion and the provisioning of need at a peer level (pp133–134), the building of a sense of community in the classroom and the role of practitioners in 'modelling acceptance' as a way of communicating positive and

inclusive attitudes/practices to children. They identify organisational issues that impact upon inclusion.

This study was rated as 'low' in weight of evidence for both questions (a) and (b) as a result of a number of shortcomings, including an inadequate account of the data-collection and analysis process; selective and simplistic reporting; a lack of detail and tendency to report at a rather general level; and no analysis of how identified issues of practitioner expertise, career, etc. might impact upon teachers' confidence to approach the creation of positive, inclusive environments.

4.2.6.8 Stevens and Slavin (1995a) Effects of a cooperative learning approach in reading and writing on academically handicapped and non-handicapped students

The two Stevens and Slavin studies (1995a and 1995b) are linked in that both focus on the way in which the Cooperative Integrated Reading and Composition (CIRC) Program is used in schools to support the learning of 'academically handicapped students' (Stevens and Slavin, 1995a, p241) through participation in cooperative learning team activities. CIRC is a research-informed cooperative learning approach to teaching elementary reading and language arts. It consists of three main elements: story-related activities, direct instruction in comprehension strategies, and integrated writing and language arts. The study was intended to 'extend previous research on the effectiveness of the CIRC program' (p247) by investigating the effects of long-term implementation over two years, extending coverage of grades and investigating more fully the 'academic and social outcomes of using CIRC as an approach to mainstreaming academically handicapped students' (p248).

Using a case-controlled trial, progress in reading and writing of 1,299 students in 31 experimental classes using the CIRC program was compared with progress in 32 control classes using traditional approaches. The schools were matched on socio-economic and ethnic makeup and on measures of prior achievement in literacy levels. The classes all included students with difficulties in learning whose progress was measured and compared separately.

The variables measured are reading vocabulary; reading comprehension; language mechanics; language expression; metacognitive knowledge of reading processes; and attitudes towards reading and writing. Reliability was addressed through use of standardised tests of reading. In terms of validity, the test of metacognition was said to be an indirect and inferential, rather than a direct, measure of metacognitive processes. Data were analysed using the hierarchical linear model (Bryk *et al.*, 1988) to control for the clustering effects of the data and the fact that this was not a randomised control trial; that is, to 'resolve problems related to multilevel data' (p251). Grade x treatment interactions were conducted to test for differential effects of the treatment at different grades. Pre-test measures were used to control for any baseline differences between the groups.

Findings show that students in classrooms in which teachers provide explicit instruction on reading comprehension strategies and use a writing process approach to teach writing and language arts, and where students are organised in cooperative learning teams on reading and writing activities, made greater progress in reading vocabulary, comprehension, language mechanics and expression than students in traditional classrooms. This was the case for students with and without difficulties in learning. Thus, Stevens and Slavin claim the CIRC programme can provide a vehicle for effectively mainstreaming academically handicapped students into regular education classes.

The reviewers had very few concerns about the overall trustworthiness of the study, but commented that the issue of attrition was not addressed and the number of participants in post-tests was not discussed. In addition, all the effect sizes for the whole population were small and Stevens and Slavin do not acknowledge this. Nonetheless the weights of evidence for questions (a) and (b) were judged to be medium-high.

4.2.6.9 Stevens and Slavin (1995b) The cooperative elementary school: effects on students' achievement, attitudes, and social relations

The second study by Stevens and Slavin was conducted in elementary schools in predominantly 'working-class' neighbourhoods. It intended to find whether cooperative learning could be used on a broad scale in many subjects and over extended periods of time to fundamentally change the organisation of schools and classrooms; whether cooperative learning methods would still be effective (and lastingly so) if they became the primary mode of instruction in schools; and whether schoolwide use of cooperative principles enhance a school's potential to successfully mainstream learning disabled students.

While the study emphasises a cross-curricula, whole-school focus, it has significant focus on aspects of literacy and mathematics in the measures it utilises. Under the broad consideration of cooperative learning, the study establishes a model of the 'cooperative elementary school' with characteristics of:

- Widespread use of cooperative learning in academic classes

- Mainstreaming learning disabled students in regular education

- Teachers coaching one another

- Principal and teachers collaborating on school planning and decision-making

- Principal and teachers encouraging active involvement of parents (p325)

- A steering committee within the school to develop the ongoing training and development

The study focuses particularly on two intervention programmes: the Cooperative Integrated Reading and Composition (CIRC) (see above, Stevens 1995a) and Team Assisted Individualisation - Mathematics (TAI). It involved a sample of '1,012 students in second through sixth grades in five elementary schools', two treatment schools and three comparison schools (p329). Measures were taken of educational achievement (specifically reading, language and mathematics); attitudes towards and perceived ability in reading, language arts and mathematics; and social relations (specifically the frequency and incidence of friendships). A range of statistical methods and tests were used to analyse the data, including multi-level modelling; conversion of standardised test score to z-scores; regression analysis; and ANCOVA and ANOVA.

In achievement, significant differences were found:
- Between treatment (Tr) and comparison (Cp) groups with reference to reading vocabulary, reading comprehension, language expression and mathematics computation
- Between learning disabled students of Tr and Cp groups after second year

with reference to reading vocabulary, reading comprehension, language expression, mathematics computation, and mathematics application

- Between gifted students of Tr and Cp groups after second year with reference to reading vocabulary, reading comprehension, language expression and mathematics computation

On the attitude measures, students in Tr group had higher perceived abilities in reading and language arts after two years and learning disabled students had higher post-test measures in perceived abilities in reading and language arts. In terms of social relations, overall, students in Tr group listed significantly more friends than those in Cp group after the two years of the study (p335) and for learning disabled students, those in Tr also listed more friends that their contemporaries in the Cp group after two years. Stevens and Slavin conclude that ascription of the programme's outcomes is difficult to ascribe to any one single element of cooperative learning

Reviewers found some concern with the unclear issue of attrition, but adequate statistical detail was provided to assess the reliability and validity of the measures. They conclude that, overall, the authors provide good, well-balanced accounts of the findings of the study, including instances where the evidence is inconclusive or suggests minimal or no effect. They also provide a good discussion of limitations, including those perhaps attributable to measures and research design, in the concluding sections. The choice of research design was seen as appropriate to the research question posed. The results, however, could be considered significantly context-specific, particularly in light of the range of potentially variable factors present (e.g. teacher effects, nature of special educational needs) and the limited contextual detail (e.g. ethnicity, gender, school/class size). Generalisability was seen as problematic under these conditions. The reviewers conclude that, overall, the findings can be seen to have a moderate level of trustworthiness and the weight of evidence is seen as medium for both questions.

4.2.6.10 Summey (1997) An exploratory study of mainstreamed seventh graders' perceptions of an inclusive approach to instruction

Summey's study was conducted in a seventh grade language arts classroom in a suburban middle school in the USA. It aimed to address the two questions of how seventh-grade students with disabilities in an inclusive classroom perceive themselves as learners and how they respond to the 'mindful learning' approach to language arts instruction. Mindful Learning was part of a professional development school plan intended to incorporate into a unit of classwork a variety of learning styles, based on Gardner's (1983) theory of multiple intelligences.

Students with disabilities were interviewed and observed and assessments of students' skills in reading and their use of strategies in answering questions were conducted at the start and end of the programme, using the Flynt-Cooter reading inventory. Students' perceptions of their own reading abilities was also collected through interviews.

Summey found that mainstreamed students benefited from Mindful Learning activities: eight out of 11 students demonstrated and articulated more functional reading strategies and completed classroom assignments in a proficient manner. All students reported some degree of involvement with the Mindful Learning activities and interviews indicated enjoyment.

The reviewers identified important shortcomings in the study. Students who had poor functional reading skills could not engage with certain aspects of the assessments and programme. The programme itself was not designed to teach these skills, which raises questions of ethics. Some students may have been presented with tasks which were inappropriate for their reading and writing level, and, on the basis of these, it is recommended that such students should be removed from the class for specialised teaching. The recommendation that students who are critically behind their peers will need to be withdrawn to a separate setting is not based on the evidence presented. The reviewers conclude that the approach, which aimed to develop 'mindful learning', achieved this only for students who appeared to possess the necessary literacy skills to engage with the assessment tasks. The study did not earn sufficient trustworthiness or weight of evidence to be included in the final synthesis.

4.2.7 Soundness of study

As discussed above, the soundness of the 10 studies was judged by the reviewers. This was part of the EPPI-Centre data-extraction process answering the following question: taking account all quality-assessment issues, can the study findings be trusted in answering the study question(s)? This constituted weight of evidence A. (The overview is illustrated in Table 4.5.) Most of the studies (six) achieved a medium rating. In these tables 'Soundness of study' is judged as an overall summary of the ratings given for trustworthiness of findings and trustworthiness of conclusion. Where there was any doubt, a lower summary rating was used.

Table 4.5: Soundness of study (N=10)

Soundness of study	Number	Studies (identified by author)
High	1	Cushing (1997)
Medium-High	1	Stevens and Slavin (1995a)
Medium	6	Beaumont (1999); Frederickson (2002); Goatley (1996); Palincsar *et al.* (2001); Stevens and Slavin (1995b); Summey (1997)
Medium-Low	1	Salisbury *et al.* (1995)
Low	1	Blum (2002)

4.2.8 Weight of evidence

Other types of weight of evidence (WoE) judgements were applied as part of the review-specific data-extraction. WoE B refers to the appropriateness of research design and analysis for addressing the question, or sub-questions, of the specific systematic review? WoE C refers to the relevance of the particular focus of the study (including conceptual focus, context, sample and measures) for addressing the question or sub-questions of the specific systematic review? WoE D is cumulative and takes into account quality of execution, appropriateness of design and relevance of focus to judge the overall weight of evidence the study provides to answer the question of the specific systematic review. This was calculated, using the formula described in Chapter 2. It was agreed that the weight of

evidence for each study should be judged separately against each of the specific questions (a) and (b) above. The outcomes of this exercise are shown in Tables 4.6 and 4.7.

Table 4.6: Weight of evidence ratings for individual elements for question (a)

Question (a)			
Does a pedagogy involving a peer group interactive approach effectively include children with SEN in mainstream classrooms?			
	Soundness of study	**Appropriateness of design for research question**	**Appropriateness of focus for research question**	**Overall weight of evidence**
Beaumont (1999)	Medium	Low	Medium	Low
Blum (2002)	Low	Low	Low-medium	Low
Cushing (1997)	High	Medium	High	Medium
Frederickson (2002)	Medium	Medium-high	High	Medium-high
Goatley (1996)	Medium	Low	Low	Low
Palincsar *et al.* (2001)	Medium	Medium	High	Medium
Salisbury *et al.* (1995)	Low-medium	Low	Low-medium	Low
Stevens and Slavin (1995a)	Medium-high	Medium-high	High	Medium-high
Stevens and Slavin (1995b)	Medium	Medium	Medium	Medium
Summey (1997)	Medium	Low	Medium	Low

Table 4.7: Weight of evidence ratings for individual elements for question (b)

Question (b)
How do mainstream classroom teachers enhance the academic attainment and social inclusion of children with special educational needs through peer group interactions?

	Soundness of study	Appropriateness of design for research question	Appropriateness of focus for research question	Overall weight of evidence
Beaumont (1999)	Medium	Medium	Medium	Medium
Blum (2002)	Low	Medium	Low-medium	Low-medium
Cushing (1997)	High	Medium-low	High	Medium
Frederickson (2002)	Medium	Medium-high	Medium	Medium
Goatley (1996)	Medium	Medium	Medium	Medium
Palincsar *et al.* (2001)	Medium	High	High	High
Salisbury *et al.* (1995)	Low-medium	Low	Low-medium	Low
Stevens and Slavin (1995a)	Medium-high	High	High	Medium-high
Stevens and Slavin (1995b)	Medium	Medium	Medium	Medium
Summey (1997)	Medium	Low	Medium	Low

4.2.9 Studies excluded from final synthesis of evidence

The rationale underpinning the current literature review was to identify studies that were of the most direct relevance to teachers - in training and newly qualified - as well as training providers, in considering ways to include students with special educational needs in mainstream classrooms. Teachers and training providers are unlikely to be confident in studies with a low overall weight of evidence. Therefore, after analysis of the reviewers' judgment of the relative weights of evidence against questions (a) and (b), a decision was taken to exclude from the final synthesis of evidence those studies where the weight of evidence was judged as 'low' or 'low-medium'. Five studies were excluded from the synthesis as a result of 'low' or 'low-medium' weight of evidence against question (a): Beaumont (1999), Blum (2002), Goatley (1996), Salisbury (1995) and Summey (1997). Three studies were excluded from the synthesis as a result of 'low' or 'low-medium' weight of evidence against question (b): Blum (2002), Salisbury (1995) and Summey (1997). The studies of both Goatley (1996) and Beaumont (1999) were given a 'medium' rating and therefore appear in the final synthesis in relation to question (b) only.

4.3 Final synthesis of studies

4.3.1 Process from mapping to final synthesis

Figure 4.1 charts the process and results from systematic map to in-depth review

and final synthesis.

Figure 4.1: Showing descriptive mapping to final synthesis
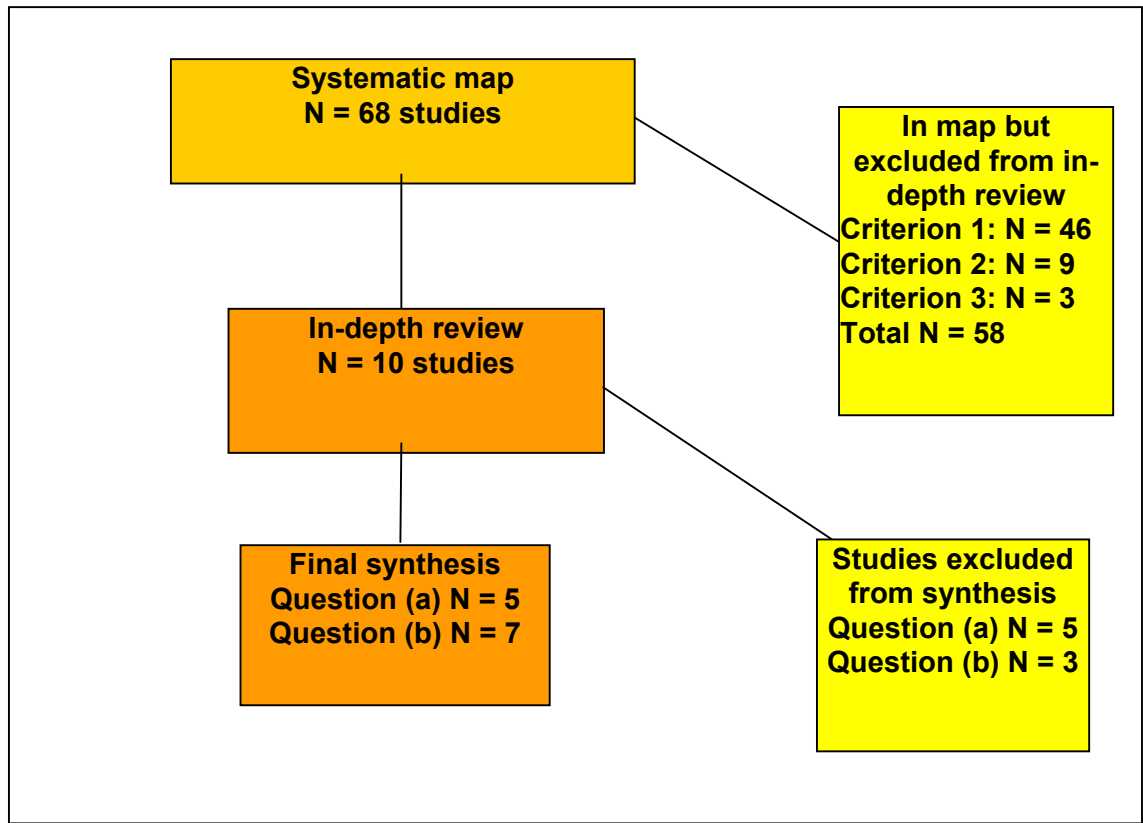
4.3.2 Outline of studies contributing to the final synthesis of evidence

Those studies included in the final synthesis in relation to question (a) (Does a pedagogy involving a peer group interactive approach effectively include children with special educational needs in mainstream classrooms?) are those rated highest in overall weight of evidence by reviewers. These five are as follows:

- Cushing LS (1997) Disentangling the effect of curricular revision and social grouping within cooperative learning arrangements. *Focus on Autism and Other Developmental Disabilities* **12:** 231–240.

- Frederickson N (2002) Utilizing the classroom peer group to address children's social needs: an evaluation of the Circle of Friends intervention approach. *Journal of Special Education* **36:** 234–245.

- Palincsar AS *et al*. (2001) Making science accessible to all: results of a design experiment in inclusive classrooms. *Learning Disability Quarterly* **24:** 15–32.

- Stevens RJ, Slavin RE (1995) Effects of a cooperative learning approach in reading and writing on academically handicapped and non-handicapped students. *Elementary School Journal* **95:** 241–262.

- Stevens RJ, Slavin RE (1995) The cooperative elementary school: effects on students' achievement, attitudes and social relations. *American Educational Research Journal* **32:** 321–351.

These five differed from the other five in the subset of 10 in that they were rated as 'medium' or 'medium to high' by reviewers for overall weight of evidence (see below). In this, they were rated more highly than the other studies. No study achieved a 'high' rating for overall weight of evidence in relation to question (a). (See Table 4.8)

Table 4.8: Weight of evidence for individual elements in studies included in final synthesis for question (a)

Question (a) Does a pedagogy involving a peer group interactive approach effectively include children with SEN in mainstream classrooms?				
	Soundness of study	**Appropriateness of design for research question**	**Appropriateness of focus for research question**	**Overall weight of evidence**
Cushing (1997)	High	Medium	High	Medium
Frederickson (2002)	Medium	Medium-High	High	Medium-High
Palincsar *et al.* (2001)	Medium	Medium	High	Medium
Stevens and Slavin (1995a)	Medium-High	Medium-High	High	Medium-High
Stevens and Slavin (1995b)	Medium	Medium	Medium	Medium

Seven studies were included in the final synthesis in relation to question (b) (How do mainstream classroom teachers enhance the academic attainment and social inclusion of children with special educational needs through peer group interactions?). These were the above five together with the following:

- Goatley VJ (1996) The participation of a student identified as learning disabled in a regular education book club: the case of Stark. *Reading and Writing Quarterly* **12:** 195–214.

- Beaumont CJ (1999) Dilemmas of peer assistance in a bilingual full inclusion classroom. *Elementary School Journal* **99:** 233–254.

These seven were rated the highest in the subset of 10 for weight of evidence in

relation to question (b). One study only, Palincsar *et al.* (2001), was rated 'high'; the other six were rated at least 'medium' (see Table 4.9).

Table 4.9: Weight of evidence for individual elements in studies included in final synthesis for question (b)

Question (b)				
How do mainstream classroom teachers enhance the academic attainment and social inclusion of children with special educational needs through peer group interactions?				
	Soundness of study	**Appropriateness of design for research question**	**Appropriateness of focus for research question**	**Overall weight of evidence**
Beaumont (1999)	Medium	Medium	Medium	Medium
Cushing (1997)	High	Medium-low	High	Medium
Frederickson (2002)	Medium	Medium-high	Medium	Medium
Goatley (1996)	Medium	Medium	Medium	Medium
Palincsar *et al.* (2001)	Medium	High	High	High
Stevens and Slavin (1995a)	Medium-High	High	High	Medium-High
Stevens and Slavin (1995b)	Medium	Medium	Medium	Medium

4.3.3 Synthesis of evidence

The authors, in collaboration with the review team, agreed the approach to synthesising the evidence from the studies. Since most of the studies used mixed and qualitative methods, a meta-analysis of a statistical nature was ruled out. However, a narrative thematic analysis was possible and enabled common methodological, theoretical and empirical themes to be elicited. We consider methodological issues first including the scale of evidence available for both review questions.

4.3.3.1 Methodological issues

Matters of measuring of effectiveness: review question (a) Does a pedagogy involving a peer group interactive approach effectively include children with SEN in mainstream classrooms?

All five studies analysed for evidence in terms of research question (a) were

evaluations and, with the exception of Palincsar, these were researcher-manipulated. None of the studies achieved a 'high' overall rating in weight of evidence D by the reviewers against question (a). (See Table 4.10 for an overview.)

Table 4.10: Overview of weight of evidence for questions (a) and (b)

Weight of evidence	Question (a)		Question (b)	
	Number	Studies	Number	Studies
High	0		1	Palincsar *et al.* (2001)
Medium-high	2	Frederickson (2002); Stevens and Slavin (1995a)	1	Stevens and Slavin (1995a)
Medium	3	Cushing (1997); Palincsar *et al.* (2001); Stevens and Slavin (1995b)	5	Beaumont (1999); Cushing (1997); Frederickson (2002); Goatley (1996); Stevens and Slavin (1995b)

The major issue in judging overall weight of evidence against question (a) as opposed to question (b) is that to answer, with a high level of confidence, a question of the nature of whether an intervention/strategy achieves a given aim, studies would have to be both controlled and randomised. These design elements would control for the effects of researcher and selection bias, regression to the mean effects and temporal effects, and therefore permit conclusions about causality. None of the studies fulfilled the criteria of having a control group and being randomised, resulting in none of the studies achieving a 'high' rating, as shown in Table 4.8.

One of the limitations of searching for studies with a 'high' weight of evidence B – the appropriateness of design for research question (a), which is an effectiveness question – is that, by definition, the population of students to whom the term 'with special educational needs' might apply is small. There is an issue therefore in designing randomised controlled trials in this field of education. One type of study design that would be possible is a series of N=1 randomised interventions. Another could be a randomised controlled trial where the school is the unit of randomisation. However, no such study existed in the database of research to which we had access.

Matters of evaluating the quality of evidence for understanding pedagogy: Review question (b)

How do mainstream classroom teachers enhance the academic attainment and social inclusion of children with special educational needs through peer group interactions?

The stricture of studies needing to be both controlled and randomised in terms of study design (i.e. WoE B) does not apply to the more exploratory 'How do teachers …' nature of question (b). Instead, for studies to perform well in terms of weight of evidence for this question, they needed to be rich in detail in different ways. Studies that were more strongly designed and focused for question (b) were those that illustrate classroom practice in ways that are replicable and where generalisability emanates more from teachers being able to identify with the classrooms described. The studies by Palincsar and Stevens (1995a) are particularly strong in this respect (see Table 4.9).

4.3.3.2 Synthesis of evidence for question (a)

Together the five studies by Cushing (1997), Frederickson (2002), Palincsar *et al.* (2001) and Stevens (1995a; 1995b) go some way toward answering the question of whether peer group interactive approaches are effective in including children with special educational needs in mainstream classrooms. We look first at the kind of evidence and then at the extent of it ─ the degree to which we can be certain of the evidence base. The differences in foci and emphasis across the studies mean that they provide a patchwork of evidence, which is accumulative in more of a varied than linear way. Nonetheless, the studies do build a picture of which elements of peer group interactive approaches have been used, in which curriculum areas, to create which kind of outcomes. Tables 4.10 summarises the foci of curriculum areas, outcomes measured, the nature of the gains made and the effect sizes of the interventions in each study included in the final synthesis of evidence against question (a).

Table 4.10 Summary of evidence synthesised for question (a)

Peer group interactive approach	Studies (Curriculum area)	Outcomes measured	Gains made/outcomes	Effect size
Cooperative learning	Cushing (1997) (Literacy)	Engagement in classroom activities Curriculum performance Social interactions with peers (frequency and duration)	Engagement same with social grouping (SG) or not. Curriculum performance marginally better without SG. Mean improvement each 44%. SG preferred by teachers and students. Social interactions: no systematic differences with/without SG.	None given
	Stevens and Slavin (1995a) (Literacy, CIRC)	Reading vocabulary Reading comprehension Language mechanics Language expression Metacognitive knowledge Attitudes toward reading and writing	Greater progress Greater progress Greater progress Greater progress Improvement No significant effect (All comparing CIRC with traditional classrooms, includes explicit instruction, writing process approach and cooperative learning teams)	Yr 1 Yr 2 +0.40* 0.37* +0.31* +0.32* +0.23 +0.28 +0.02 +0.36* (* p<0.05)

Peer group interactive approach	Studies (Curriculum area)	Outcomes measured	Gains made/outcomes	Effect size
	Stevens and Slavin (1995b) (Literacy, CIRC and Maths, TAI)	Reading vocabulary Reading comprehension Language mechanics Language expression Maths computation Maths application Metacognitive knowledge Attitudes toward reading and writing Social relations (frequency and incidence of friendship)	Greater progress Greater progress Greater progress Greater progress Greater progress Greater progress Improvement Improvement More friends in treatment schools	Yr 1 Yr 2 +0.26 +0.76** +0.29 +0.85** +0.11 +0.25 +0.37 +0.74** +0.33 +0.59** +0.16 +0.35* (* $p<0.05$ ** $p<0.01$)
Guided inquiry	Palincsar *et al.* (2001) (Science, GIsML)	Curriculum progress Classroom participation	Significant learning gains by all groups of students Depended on social and cognitive supports	None given
Circle of Friends (CoF)	Frederickson (2002) (Not curriculum focused)	Social acceptance by peers Student's global self-worth Teachers' ratings of above Perceptions of students and teachers of classroom environment	CoF had positive impact. Significant improvement in Phase 2 Unchanged Unchanged	Ph1 Ph2 +0.35** +0.49** +.24 +0.42* (* $p<0.05$ ** $p<0.01$)

The synthesis table shows that there is greatest accumulation of evidence about cooperative learning and within the curriculum area of literacy. A complicating factor, of course, is that cooperative learning is a broad term used loosely to encompass a wide range of teaching practices. Cushing (1997) is acutely aware of this and her study seeks to tease out the effect of the social grouping element of cooperative learning from the element of revising and adapting the curriculum. Stevens' evaluations of the CIRC programme, in contrast, are evaluations of cooperative learning teams working with explicit instruction and a writing process approach, or as part of a cooperative learning school ethos. Inevitably, all teaching approaches are embedded in a context and it is useful for teachers to know both what it is about cooperative learning that makes it effective and the kind of real world contexts in which cooperative learning can be a part.

Palincsar *et al*.'s (2001) Guided inquiry supporting multiple literacies (GIsML) approach has much in common with the cooperative learning approaches. The study makes a different contribution, however, through its focus on teachers' reflective practices and support for children's thinking. Frederickson's Circle of Friends approach stands out much more as an approach to social inclusion rather than academic participation and achievement.

In addition to illustrating the kinds of peer group interactive approaches for which

we have evidence of effectiveness, the synthesis table shows the common and idiosyncratic evidence in terms of variables measured and outcomes achieved through the approaches. The whole review team extensively debated our definition of inclusion in the early stages: the outcome as described in Chapter 1 was that for the purposes of this review, the term 'effectively include' concerns positive impact upon learning and participation. This might involve changes in attainment levels, progress, attitude, confidence and/or skills but the most useful approaches were anticipated to be those with evidence of impact on the learning *and* community participation of pupils with special educational needs. This dual aspect was explicitly the focus for Cushing (1997), Palincsar *et al.* (2001) and Stevens and Slavin (1995b). An interest in pupils' attitudes to their learning, abilities and each other underlies the studies in a more implicit way. Stevens and Slavin (1995a) have more of an academic focus and Frederickson (2002) more of a social focus. Therefore the evidence base has potential to inform teachers about approaches that foster academic inclusion, social inclusion and both academic and social inclusion. The extent to which this potential is realised depends somewhat on the outcomes of the studies.

The outcome of Cushing's (1997) study shows how the relationship between academic and social dimensions is not always straightforward. The social grouping element of cooperative learning appeared to make no impact on participation, a negative impact on academic achievement and to be preferred by teachers and pupils. Where the social grouping element was not isolated in Stevens and Slavin's (1995b) study, there were positive outcomes for academic achievement, self-perception and friendships. This may not indicate which element was functionally related with which outcome but may suggest the advantages of peer group interactive/cooperative learning approaches that are multi-faceted; attention to community and classroom participation should not be at the expense of attention to curriculum-related teaching and learning (see Chapter 5). Palincsar *et al.*'s (2001) study endorses this synthesis of evidence in its own finding that significant learning gains depended on social and cognitive supports.

As noted above, none of the studies were designed to control for the effects of researcher and selection bias, or regression to the mean and temporal effects. However, four studies – Cushing, 1997; Frederickson, 2002; Stevens and Slavin, 1995a; 1995b) – were controlled and therefore open to some interpretation about causality and effectiveness. Scrutiny of Table 4.10 and of the details given in Appendix 4.1 reveals that the effect sizes in the Stevens and Slavin (1995a) study are small to moderate, all positive and statistically significant in relation to five out of eight measures. In the Stevens and Slavin (1995b) study, the effect sizes are, again, all positive and vary from small to fairly large (0.76 for reading vocabulary) in year two of the intervention. In year one, none of the effects are statistically significant. However, it seems highly likely that we can be confident in attributing improvement in five out of the six measures of literacy and numeracy to the intervention ($p<0.001$). In both studies, even though the effect sizes vary from small to moderately large, they may be important in the contexts of literacy and numeracy learning in schools, given their statistical significance.

The Frederickson study is small-scale and the authors warn that the results should be treated tentatively. However, in both Phase 1 and Phase 2 of the study, statistically-significant effect sizes are reported for socio-metric ('play-with') ratings of the target children by the whole class ($p<0.01$ in both phases) and, in Phase 2, for the target children's sense of 'global self worth' ($p<0.05$). These effect sizes are moderate, varying from 0.35 to 0.49. Given the current move

towards including all children in the mainstream and the focus on pupil behaviour in schools, the findings in relation to the 'Circle of Friends' intervention may be seen as especially important.

The ABABAB design of Cushing's work was, as noted in Appendix 4.1, intended to isolate the effect of cooperative learning and interactions between the individual pupil and the peer group on classroom performance in contrast to interactions between one pupil and one peer. The learning outcomes indicate little systematic difference between the conditions, however. Given the expressed preference of educators interviewed by Cushing *et al.* for classroom learning in cooperative groups, this study is particularly important in that it appears to indicate that, if anything, support for pupils who experience difficulties may be more effective when delivered by one peer. The sample size is small, however, and more research needs to be carried out to have confidence in the results.

In the Palincsar *et al.* (2001) study, there is no indication of effect size. The work is a naturally-occurring evaluation. The non-parametric statistical tests used to determine the statistical significance of the learning gains achieved by each group of students in both Phases 1 and 2 indicate learning gains reported by the authors to be 'significant' for all groups of students: 'normally-achieving', 'identified' and 'low-achieving', by the end of Phase 2. The degree to which we can have confidence that the outcomes are not the result of chance effects are not reported for Phase 2, however.

Overall, likely effectiveness of peer group interactive approaches for inclusion of children with special educational needs in mainstream classrooms can be established with sufficient confidence to make recommendations for practice.

4.3.3.3 Synthesis of evidence for question (b): substantive theoretical and empirical themes

Question (b) requires evidence that will provide teachers/teacher trainers with a rich understanding of the processes through which inclusion is facilitated through peer group interactions. Together the six studies provide evidence in answering the question of how teachers use peer group interactive approaches to include effectively children with special educational needs in mainstream classrooms. There is not the issue of causality here that applied with question (a) and so all evidence can be regarded as strong, especially since the studies in the synthesis are only those where quality has already been assessed. Again, the studies provide a patchwork of evidence, with some accumulative dimension where themes emerge from more than one study. The studies build a detailed picture of how the elements of peer group interactive approaches have been used and the synthesis seeks to elicit common areas. Table 4.11 summarises the foci of curriculum areas, outcomes measured, the nature of the gains made and the themes emerging from each study included in the final synthesis of evidence against question (b).

Table 4.11: Summary of evidence synthesised for question (b)

Peer group interactive approach	Studies (Curriculum area)	Outcomes measured	Gains made/outcomes	Emerging themes

Cooperative learning	Beaumont (1999) (not curriculum-focused)	Spontaneous, unstructured peer assistance interactions Helping episodes Participation in and success with academic tasks	Giving and receiving of help were multilayered. Access to peer assistance was unequal. Social and academic worlds were entwined. 40% of helping episodes were successful. Regular education students support special education students, while special education students try to support regular education students but are often rejected.	Students' agency in learning Integration of academic and social concerns Shared school philosophy
	Cushing (1997) (Literacy)	Engagement in classroom activities Curriculum performance Social interactions with peers (frequency and duration)	Engagement same with social grouping (SG) or not Curriculum performance better without SG SG preferred by teachers and students Social interactions: no systematic with/without SG	Students' agency in learning Integration of academic and social concerns Delineation of group roles Holistic views of 'basic skills' Shared school philosophy
	Goatley (1996) (Literacy, book club)	Reading comprehension Writing Social skills Level of teacher support in the classroom	Improved Improved Improved The 'reflective role of the teacher is crucial for success of special education students' (p212).	Students' agency in learning Integration of academic and social concerns Delineation of group roles Holistic views of 'basic skills' Shared school philosophy
	Stevens and Slavin (1995a) (Literacy, CIRC)	Reading vocabulary Reading comprehension Language mechanics Language expression Metacognitive knowledge Attitudes toward reading and writing	Greater progress Greater progress Greater progress Greater progress Greater progress Improvement (All comparing CIRC with traditional classrooms, includes explicit instruction, writing process approach and cooperative learning teams)	Students' agency in learning Integration of academic and social concerns Delineation of group roles Holistic views of 'basic skills' Shared school philosophy

	Stevens and Slavin (1995b) (Literacy, CIRC and Maths, TAI)	Reading vocabulary	Improved	Students' agency in learning
		Reading comprehension	Improved	Integration of academic and social concerns
		Language mechanics	Improved	Delineation of group roles
		Language expression	Improved	Holistic views of 'basic skills'
		Maths computation	Improved	Shared school philosophy
		Maths application	Improved	
		Metacognitive knowledge	Improved	
		Attitudes toward reading and writing	Improved	
		Social relations (frequency and incidence of friendship)	More friends in treatment schools	
Guided inquiry	Palincsar *et al.* (2001) (Science, GisML)	Curriculum progress Classroom participation	Significant learning gains by all groups of students Depended on social and cognitive supports	Students' agency in learning; Holistic views of 'basic skills'; Shared school philosophy.
Circle of Friends (CoF)	Frederickson (2002) (Not curriculum-focused)	Social acceptance by peers Student's global self-worth Teachers' ratings of above Teacher's and student's perceptions of classroom environment	CoF had positive impact. Significant improvement in Phase 2 Unchanged Unchanged	Students' agency in learning Integration of academic and social concerns Delineation of group roles Shared school philosophy

Five themes emerged from the studies synthesised for question (b): the model of pupil-as-learner; integration of academic and social considerations; organisational and organised support; holistic views of 'basic skills'; and shared philosophy. The themes are generic rather than related to pupils with particular kinds of special needs. They are all relevant to our original subsidiary questions about the kinds of classroom environments that teachers create to enable all learners to experience achievement.

(a) Model of pupil-as-learner
A key feature of all the studies in the synthesis for question (b) is a clear understanding of the model of pupil as having active agency in the construction of personal knowledge and of all pupils as capable of learning. It is quite clear that the model of pupil-as-learner that underpins these studies is of crucial importance to their design and implementation. In the two Stevens and Slavin studies (1995a; 1995b), for example, a pedagogy is researched which includes cooperative group learning activities and a focus on the construction of knowledge through scaffolding by, and dialogue with, peers. This reflects a view of pupils as having active agency in their learning and a view of the learning environment as playing a key role in an understanding of pupil learning acquired through social interactions. Goatley's reference to a 'peer-led discussion group' (1997, p195), Cushing's (1997) work in teasing out the way in which social groupings contribute to cooperative learning and Palincsar et al's (2001) view of science learning in its inquiry-based approach all appear to take a similar view of

the pupil as active agent in the construction of personal knowledge. In her work on the 'Circle of Friends' intervention, Frederickson acknowledges the importance of 'social network effects' for the 'generalization and maintenance of outcomes for intervention programs that focus on the social cognitions and behaviours of individual students' (2002, p235).

(b) Integration of academic and social considerations
In studying the potential for the peer group to support the achievement and progress of pupils with special educational needs in mainstream classrooms, there is recognition in these studies that a sense of belonging to, and participation in, the learning community has an important effect of young people's learning in schools. Cushing's (1997) work is specifically concerned with the relative effects of social grouping and individual peer coaching on social interactions as well as academic achievement. Both Goatley's (1997) and Frederickson's (2002) studies have foci on social acceptance by peers as well as on overall achievement. The Stevens and Slavin (1995a; 1995b) studies measure progress both in literacy learning (and in mathematics learning in Stevens and Slavin, 1995b) and in acquisition of social skills. Attention to the social considerations connects with our concern with the children's views on classroom practices.

(c) Organisational and organised support
There is a clear understanding in these studies of the model of pupil actively constructing knowledge through social interactions as applying to all other members of the school community, both adults and peers. Stevens and Slavin (1995b), for example, writes from a whole-school perspective of the 'cooperative elementary school' where teachers, principals and parents collaborate in instructional planning, decision-making and in coaching one another (see Stevens and Slavin, 1995b, p 327). In the cooperative learning groups discussed by several of these studies (Cushing, 1997; Frederickson, 2002; Stevens and Slavin, 1995a; 1995b) there is a clear view of the need for a careful delineation of the roles of group members. Roles and group interactions are carefully planned with the pupils' learning at the centre of the planning process.

(d) Holistic views of 'basic skills'
The views of skill acquisition, particularly in the areas of literacy and numeracy, that underpin these studies tend to be holistic and related to their application to the real-world context. In the two studies by Stevens and Slavin (1995a; 1995b), it is clear that the literacy curriculum is conceived from a holistic view through the CIRC programmes which, as noted above, take an integrated approach to literacy learning and consist of three main elements: story-related activities, direct instruction in comprehension strategies and integrated writing and language arts. Goatley's (1997) case study of the inclusion of a pupil in a 'peer-led literature discussion group' (p195) adopts the same view. This holistic approach is very different from the more usual fragmented or task-analysed, phonics-based approach to literacy instruction for those pupils deemed to have special educational needs. Equally, the team-assisted individualisation (TAI) approach to mathematics suggests an acknowledgement of the importance of the social context in numeracy learning rather than the individualised instruction in number more usually associated with 'remediation' approaches to the learning needs of pupils with special educational needs.

The approach to literacy learning is less clear in Cushing's (1997) work. However, a pedagogy which includes cooperative group learning activities is much more likely to reflect a holistic view of literacy learning of the sort advocated

by Stevens and Slavin, than a phonics-based approach.

Palincsar et al's (2001) view of science learning takes a similarly holistic, contextually grounded rather than partist, approach in its inquiry-based pedagogy.

(e) Shared philosophy

Implicit in the approaches researched in these papers is a need for everyone to share and understand a common school philosophy about everyone's learning and respect for individuals who experience difficulties. 'Inclusion' of individuals in mainstream classrooms in the sense of participation in the learning community cannot occur without cooperation and collaboration. As evidenced in Palincsar et al's (2001) 'community of enquiry', Stevens and Slavin's (1995a; 1995b) 'cooperative elementary school', Goatley's (1997) book club, Frederickson's (2002) focus on classroom peers as a network of social support, Beaumont's (1999) research on peer assistance and Cushing's (1997) work on cooperative learning arrangements, cooperative groupwork in a cooperative classroom is unlikely to occur consistently and as a regular part of the curriculum unless cooperation, collaboration and negotiation are a hallmark of the school as a whole.

Overall, therefore, the studies provide evidence, albeit somewhat patchy, of how the elements of peer group interactive approaches have been used to support the inclusion in mainstream classrooms of pupils with special needs and of the way in which these approaches have implications for the organisation and overall philosophy of schools.

4.4 In-depth review: quality-assurance results

Chapter 2 includes an account of the quality-assurance process of the in-depth review. Here we offer an elaboration of the results of that process for the 10 studies that were subjected to the EPPI-Centre quality-assurance procedure at the in-depth review stage. The 10 studies were independently data-extracted by two members of the review team and, following moderation, a final version was agreed.

Overall, there was very high agreement between pairs of reviewers. Issues to be resolved in moderation largely related to weight of evidence B and D in relation to question (a) in the in-depth review. It was noted by all reviewers that, to obtain a 'high' rating for overall weight of evidence against question (a), the study would have to be a randomised controlled trial, and this was difficult to conceptualise where there was a low population from which to select participants (see above).

Other issues include interpretations of what constituted an evaluation occurring naturally, and what constituted a researcher-manipulated evaluation. In some papers, for example Stevens and Slavin (1995a), it was initially unclear whether the intervention was already operating in some schools or whether it was introduced for the purposes of the study. Careful scrutiny of the studies resolved these issues where they occurred. There was also very close agreement between the data-extraction of two review team members and that of our EPPI-Centre colleague who also data-extracted two of the 10 studies. Once again, areas of initial disagreement related to ratings of overall weight of evidence against question (a) and discriminating naturally-occurring from researcher-manipulated evaluations. Overall discussion led to consensus and an agreed

response to the items, where there had been some initial misalignment. Apart from these specific issues, there was very high agreement, both between the internal reviewers and between internal and EPPI-Centre colleagues, about 'weight of evidence'.

4.5 Nature of actual involvement of users in the review and its impact

The beginning of Chapter 2 describes the approach to, and rationale for, user-involvement. As we explained there, actual involvement of users consisted mostly of individual replies to correspondence by letter and email. However, most of the extended team had several conversations with practising teachers or teachers in training, members of teacher support teams or psychological services employed by local education authorities, colleagues working in HE provision in the area of teacher training or teacher professional development.

Email facilitated communication across the entire team. There were three key points at which this form of communication was especially helpful: at the point of determining our focus; at the point of agreeing the protocol; and at the point of negotiating the final two questions for the in-depth review.

While evidence of impact is not available to us at the time of preparing this report, we are aware that our colleagues are already disseminating the results of the review to their pupils. In addition, a seminar to reflect on the process and to discuss the findings was carried out in September at the annual conference of the British Education Research Association (BERA).

The final chapter summarises the findings and offers some recommendations for policy, practice and research.

5. FINDINGS AND IMPLICATIONS

This systematic literature review set out to answer a specific question about what pedagogical approaches can effectively include children with special educational needs in mainstream classrooms. By the stage of the in-depth review and synthesis of evidence, this question was refined to a focus on peer group interactive approaches – whether they are effective for inclusion and how mainstream teachers use them. The aspiration was to assess the evidential base from which useful findings, conclusions and implications of particular importance to the TTA might be derived. This chapter summarises the systematic review journey together with the major substantial and methodological findings. It considers the strengths and limitations of the review. Finally, it offers proposals for the policy, practice and research implications of the findings.

5.1 Summary of principal findings

5.1.1 Identification of studies

The identification of studies was guided by the review question. Our interest in teaching approaches that effectively include children with special educational needs in mainstream classrooms dictated the mainstream context and the focus on pedagogy. The effectiveness element meant that we needed to identify studies that include outcomes for pupils. A concern with teaching approaches that a wide range of trainee and new teachers could use led us to focus on the main years of compulsory schooling excluding early years and Key Stage 4, where pedagogy might be quite different. Thus, the particular contexts examined in the review are in mainstream schools, serving the 7–14 age range. It was also agreed to focus on those studies from the last ten years, following the universal commitment to inclusion expressed in the Salamanca statement by UNESCO (1994). We focused on as wide and as comprehensive a range of relevant research studies as we could and we included work that was both quantitative and qualitative in research orientation.

Having agreed the criteria for inclusion in the review with the extended team, the mapping exercise included those studies that:

- Focus on pupils who experience special educational needs of some kind
- Were conducted in mainstream classrooms
- Were concerned with pedagogical approaches
- Indicate pupil outcomes
- Pertain to the 7–14 age range
- Are empirical studies or systematic reviews
- Are written in English
- Are produced or published between the years 1994 and 2004

At this stage, criteria pertaining to the quality of the research were not considered. Clearly, therefore, a study could meet the criteria above, but not be rigorous. For example, the study might be poorly designed to answer its own or our research question, or issues of reliability and generalisability may have been

inadequately addressed. Criteria pertaining to quality were considered later in the process at the in-depth review stage. Electronic databases, journals and internet sites were searched, using an appropriate search strategy and the results of the various searches were incorporated into an EndNote database.

5.1.2 Mapping of all included studies

The studies included in the review proceeded through a series of graduated filters. Initially, a database was made of all the studies retrieved from electronic databases, electronically processed online journals and searches of websites. Initially the inclusion and exclusion criteria were applied to the titles and abstracts of studies in this database. A second screen refined the resulting list of included studies and this list was entered into a second database. Full copies of as many as possible of those studies in this second database were obtained. The inclusion/exclusion criteria were applied to the full documents so as to exclude any which, upon fuller scrutiny, did not meet the inclusion criteria. All the studies which remained were keyworded using EPPI-Centre Core Keywording Strategy (EPPI-Centre, 2002a), together with some additional review-specific keywords. This process permitted the building of a 'descriptive map' of 68 studies in our review.

5.1.3 Nature of studies selected for in-depth review

In seeking to extract a manageable subset from the 68 studies in the descriptive map that would be of maximum interest and of use to prospective and practising teachers and training providers, we sought further advice from our advisory group. The review-specific keywording had included categorisation of the teaching approaches researched in the studies and peer group interactive approaches emerged as a strong group which attracted interest among the advisory group as potentially most useful to teachers. We were concerned to maintain our original review question, but decided to search amongst the studies to discover those which answer the following more specific questions:

Question (a): Does a pedagogy involving a peer group interactive approach effectively include children with SEN in mainstream classrooms?

Question (b): How do mainstream classroom teachers enhance the academic attainment and social inclusion of children with special educational needs through peer group interactions?

New inclusion/exclusion criteria were applied and 10 studies emerged from the descriptive map for in-depth review. Each of these 10 studies satisfied the inclusion criteria of being considered to focus on a peer group interactive pedagogical approach (that went beyond peer tutoring) and to be conducted by mainstream classroom teachers without necessitating additional staff support. In this way, they were deemed by the team to be of direct relevance and usefulness to the Teacher Training Agency and those institutions where student teachers are trained. Each of the 10 studies was subjected to the EPPI-Centre data-extraction process and narrative descriptions as well as quality assessments and weight of evidence measures were generated.

5.1.4 Synthesis of findings from studies in in-depth review

The 10 studies in the in-depth review reflect those in the wider map in that there is a bias towards studies conducted in the USA with a teaching and learning focus. They differ, however, in being more biased towards primary contexts and more dominated by evaluation studies. The 10 studies do not lend themselves to statistical synthesis but narrative, thematic synthesis was possible. The studies were examined in relation to the two specific in-depth review questions and synthesis of the weight of evidence for the effectiveness of peer group interactive approaches was derived alongside thematic analysis in relation to how teachers use the approaches.

Although several studies were deemed to be medium or medium-high in terms of weight of evidence, an issue remains about the scale of evidence available to address the research question. Four studies, which incorporate empirical validations of effectiveness (Cushing, 1997; Frederickson, 2002; Stevens and Slavin, 1995a; 1995b), are based on small samples and were controlled but not randomised. This is unsurprising. Although the population that might fall within a broad definition of special educational needs might be large, nevertheless the population within any specifically labeled group (for example visually impaired, hearing impaired, learning disabled) in any one mainstream school is likely to be low.

There are no studies with high weight of evidence for question (a) and only one for question (b). Nevertheless, there is evidence of interventions having a statistically significant effect on measured outcomes in some studies (Frederickson, 2002; Palincsar, 2000; Stevens and Slavin, 1995a; 1995b). There is reason to have confidence in the evidence collected in these studies, therefore, but generalisation over a larger population may be more problematic. However, effect sizes in some studies (e.g. Frederickson, 2002; Stevens and Slavin, 1995a; 1995b) were small to moderately large and may be significant in the context of schools generally.

Despite these limitations, the findings of the review offer some scope for making tentative recommendations for practice. Scrutiny across the 10 studies in this review and, more specifically, across the studies in the synthesis indicates that the effectiveness of peer group interactive approaches for inclusion of children with special educational needs in mainstream classrooms can be established. Moreover, we have an evidence base (albeit small) on how teachers use these approaches: that is, some qualitative understanding of the processes at work. The findings are summarised below under the following key headings: types of peer group interactive approaches; academic outcomes; social inclusion; attitudes; the relationship between academic, social and attitudinal outcomes; teacher skills; and substantive theoretical and empirical themes.

5.1.4.1 Types of peer group interactive approaches

There is a small accumulation of evidence about the effectiveness of cooperative learning particularly in relation to the curriculum area of literacy. Cooperative learning encompasses a range of teaching practices and the evidence base relates to the elements of social grouping/teamwork (Cushing, 1997; Stevens and Slavin, 1995b), revising and adapting the curriculum (Cushing, 1997; Stevens and Slavin, 1995a; 1995b) and working with a cooperative learning school ethos (Stevens and Slavin, 1995b). Specific evidence is available for the effectiveness of two cooperative learning programmes: cooperative integrated reading and composition (CIRC, Stevens and Slavin 1995a; 1995b) and team-assisted individualisation (TAI, Stevens and Slavin, 1995b).

Other types of peer group interactive approaches for which the review found evidence of effectiveness also reflect specific programmes: guided inquiry supporting multiple literacies (GIsML, Palincsar *et al.,* 2001) and Circle of Friends (Frederickson, 2002). The former shares in common with CIRC and TAI a focus on how to teach subject-specific knowledge and skills as well as how to enable peers to support each other. The approach has much in common with the cooperative learning approaches. The latter is an approach to facilitating social acceptance rather than academic achievement. Nonetheless, it shares a concern with pupils helping each other to see and think about things from different perspectives.

5.1.4.2 Academic outcomes

The premise of the review has been that to 'effectively include', a teaching approach needs to address both learning and participation in mainstream classroom activities. All the studies show evidence of some learning and, with the exception of Frederickson's (2002) Circle of Friends approach, this has included learning in the academic domain. Three studies provide explicit evidence of impact on both the academic learning and community participation of pupils with special educational needs (Cushing, 1997; Palincsar *et al.,* 2001; Stevens and Slavin, 1995b). A further study provides evidence of academic rather than social gains (Stevens and Slavin, 1995a).

5.1.4.3 Social inclusion

Early efforts at integration have been criticised on the grounds that pupils with special needs may be present in mainstream classrooms, but not learning and not participating (Mittler, 2000). As stated above, the outcomes of three studies were both enhanced academic learning *and* community participation of pupils with special educational needs (Cushing, 1997; Palincsar *et al.*, 2001; Stevens and Slavin, 1995b) and a further study provides evidence of gains in terms of the social acceptance of pupils with special needs by peers (Frederickson, 2002).

5.1.4.4 Attitudes

Changes in children's attitudes were measured in some of the studies. Thus, the evidence also indicates improved attitudes toward reading and writing (Stevens, 1995a), reading, language and maths (Stevens, 1995b), and children's own views of their competence, acceptance and self-worth (Frederickson, 2002).

5.1.4.5 The relationship between academic, social and attitudinal outcomes

The evidence indicates that peer group interactive approaches that are effective in academic terms are also often effective in terms of social participation and children's attitudes to their learning. Teasing out the elements of the approaches that are functionally related with each outcome (as Cushing attempts to do) is difficult and perhaps unnecessary in professional rather than research terms. The outcome of Cushing's (1997) study shows how the relationship between academic and social dimensions is not always straightforward. The studies show the advantages of peer group interactive/cooperative learning approaches that are multi-faceted and indicate that attention to community and classroom participation should not be at the expense of attention to curriculum-related teaching and learning. One study (Palincsar *et al.,* 2001), which found that significant learning gains depend on social and cognitive supports, underlined this point.

5.1.4.6 Teacher skills

An important feature of the way in which the studies were selected for the in-depth review is that all the approaches were used by mainstream teachers without the need for additional human resource other than the pupils themselves. Thus the outcomes came from teachers using their own skills and those they fostered in their pupils. This does not mean that all the teachers in the studies are typical however. Palincsar *et al.* (2001) acknowledge that the teachers in their study were already part of a Community of Practice network and were familiar with reflective practice and thinking about teaching and learning in subject-specific ways. Generally less is known about the teachers in the studies than about the pupils, but one can infer from the findings that they were, or became, skilled in using peer group interactive approaches (see discussion of question (b)).

5.1.4.7 Substantive theoretical and empirical themes

Question (b) is about gaining insights into how teachers facilitate effective inclusion of pupils with special educational needs through peer group interactions. Some of these insights have already been discussed: that is, the type of approaches teachers use and the skills they apply. The findings for question (b) also take the form of substantive theoretical and empirical themes that emerged through synthesising the data: the model of pupil-as-learner; integration of academic and social considerations; organisational and organised support; holistic views of 'basic skills'; and shared philosophy.

The model of pupil as learner and having active agency in the construction of personal knowledge underpinned the studies and the interventions. Moreover, all pupils were conceptualised as capable of learning. Teachers fostered the co-construction of knowledge through scaffolding by, and dialogue with, peers. This took the form of peer-led discussion groups (Cushing, 1997; Stevens and Slavin, 1995a; 1995b), careful questioning of pupils (Palincsar *et al.,* 2001) and focusing on social cognition and behaviours (Frederickson, 2002).

The second theme to emerge was the recognition in these studies that a sense of belonging to, and participation in, the learning community has an important effect of young people's learning in schools. This is discussed above in relation to the findings for question (a): social and academic inclusion are linked and the fostering of them can be conceptualised as an integrated endeavour.

The third theme is that of teachers making use of organisational and organised support. As well as utilising pupils as resources for learning, teachers who use peer group interactive approaches use the other adults within the school community. This both models cooperative learning and provides additional supports. Teachers are also aware of the need for careful planning of group work, including delineation of the roles of group members.

The fourth theme linking some of the teaching approaches studied is an holistic approach to skill development. Teachers effectively using peer group interactive approaches work on (basic) skills in a holistic way, embedded in classroom activity and subject knowledge. This is in contrast to the isolated skill development associated with traditional remedial programmes for special needs. Making use of peers may bring with it a necessity to make skill development socially meaningful.

Finally, the studies indicate a role for shared philosophy around respecting everyone in the class and all their learning. Teachers effectively including pupils with special educational needs through peer group interactions enjoy a common concern with participation in the learning community, cooperation and

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educational needs in mainstream classrooms with a particular focus on peer group interactive
approaches

collaboration.

5.2 Strengths and limitations of this systematic review

This systematic literature review has both strengths and limitations and we address these in turn.

5.2.1 Strengths

An important strength of this systematic literature review is that it asked relevant questions. The usefulness of seeking to answer the overall question and the refined two questions for the in-depth review was frequently reiterated by the advisory group. The way the questions are formulated reflects discussion with practitioners and their concern with real-world parameters. Using specific inclusion and exclusion criteria, we have systematically assembled those studies pertaining to teaching approaches that can be conducted by the mainstream teacher without additional specialist teacher presence. Thus studies are likely to prove useful to teachers and teacher-trainers where limited resource is an issue.

The review also encompasses studies of pupils representing a wide range of special educational needs, including challenging behaviour (Frederickson, 2002), difficulties in conceptual understanding (Beaumont, 1999; Palincsar *et al.*, 2001) which may be experienced to a significant degree (Cushing, 1997; Goatley, 1996), hearing impairment (Beaumont, 1999), literacy difficulties (Blum, 2002; Goatley, 1996; Stevens and Slavin, 1995a; 1995b) and numeracy difficulties (Stevens and Slavin, 1995a; 1995b).

There was high quality-assurance for the review: screening, data-extraction and quality assessment were conducted by two independent review team members (or a review team member and EPPI-Centre link-person) at each stage.

In addition to good quality-assurance, confidence in the review findings is strengthened by the quality of the studies. All the studies that we subjected to scrutiny for the synthesis were deemed at least 'medium' for weight of evidence.

Another partial strength is capacity-building. Review team members experienced and trained in systematic review skills supported colleagues in developing new skills. While colleagues in the advisory group who are teachers or involved directly in teacher education did not always participate in systematic reviewing, their empirical research skills developed over the course of the project. By being involved in all phases from identifying the focus through to the synthesis of evidence and the reporting of results, team members enhanced their capacity to evaluate what constitutes evidence and what counts as effectively including pupils with special educational needs. Everyone adopted a more interrogating approach to the evidence underpinning the teaching practices of themselves and others. Capacity building in systematic review skills could have been greater with more time and resource, but appreciation of evidence-informed practices and research capacity was enhanced.

5.2.2 Limitations

The scope of this systematic literature review inevitably has limitations. No material before 1994 was included. Similarly, it does not include teaching

approaches used to include pupils in the early years or post-14. These were deliberate choices but have a limiting effect nonetheless. The literature also ended up as limited to published literature, although this was not deliberate. A proportion of the studies that appeared from their titles and abstracts to meet the inclusion criteria did not arrive in time to be scrutinised in full. These tended to be unpublished theses (see Appendix 3.1) and therefore may be systematically different from the studies included in the map and in-depth review. There is therefore the possibility of some distortion from publication bias; negative or null outcomes are less likely to be published and so the picture emerging from the systematic review may be over-optimistic.

A more serious limitation concerns the strength of the evidence base arising from this systematic review. Only one study (for question (b)) has a high overall weight of evidence assessment and the lack of randomised control trials means that evidence of effectiveness is not as strong as it could be and generalisability across large populations may be problematic. Effect sizes were reported in only three of the studies. Additionally, the number of studies in the synthesis is small and the numbers in the samples for these are also small. While we know enough about the pupils with special needs who participated in the studies to begin to judge generalisability, we know less about the teachers themselves and how representative they may be. We also know that the contexts for the studies are likely to differ from the contexts in which UK teachers may be working. The evidence grounded in the UK is limited to one study, with the other five studies in the synthesis being USA-based.

A further limitation arises in terms of the age range to which the studies apply. All the studies except for one (Cushing, 1997) was confined to the primary school years, meaning that, as we move from up through the school system to age 14, our degree of confidence about the evidence for peer group interactive approaches drops considerably.

While real-world complexity is a strength in this literature review, questions about effective pedagogical approaches for inclusion cannot be easily reduced. Thus, while studies in this area use methodology appropriate to the complexities, the methods for synthesising across such studies are limited. This in turn limits the production of a synthesis of information in this field.

On balance, it must be recognised that conclusions are drawn from a limited research base. It may be that other review questions based on other selection criteria, incorporating different inclusion and exclusion criteria, would also offer insights into how to effectively teach children with special educational needs in mainstream classrooms in ways that benefit the academic and social inclusion of all children. It must also be recognised that some of the studies from which evidence has not been synthesised, because of matters of their quality, have insights to offer. The study by Wolford (2001), for example, was excluded from the synthesis but could be used by teacher trainers to explore in an informed way the concept of helping interactions and practices that foster positive helping experiences.

5.3 Implications

Although we offer recommendations for policy and practice, we need to add the caveat that, as the major thrust of the findings and recommendations are from the USA-based studies, their application to the UK needs to be considered with

appropriate caution. Similarly, the findings relate much more to the primary school sector where the implications can be seen as more direct.

5.3.1 Policy

Policy-makers should be aware that there is a shortage of evidence about the nature of teaching approaches that effectively include children with special educational needs in mainstream classrooms. There is, however, some evidence that peer group interactive approaches can be effective and policy should not deter teachers from adopting such approaches. The existing research base offers an account of (a) whether peer group interactive approaches are effective and (b) how teachers use such approaches. It indicates that effective approaches often address both social and curriculum-based support for pupils, who are regarded as active learners. It is important that this knowledge is disseminated to teacher educators and to student teachers and teachers, particularly in primary education. It is also important that it is shared with special needs advisors, inclusion advisors and Ofsted inspectors.

5.3.2 Practice

Teachers should be aware that the evidence base for teaching approaches that effectively include children with special educational needs in mainstream classrooms is small. They still have a considerable role to play in investigating what works. There is some evidence that peer group interactive approaches are effective and these approaches (amongst others) should be adopted and explored. It is very important that effective teaching for inclusion is seen as the complex practice that it is, often combining attention to (subject-specific) adaptation of teaching/curriculum with attention to community participation, social grouping and roles within the group. According to the research evidence, teaching approaches that effectively include children with special educational needs cannot be reduced to simplistic formulae but rather bring together teacher skills with a willingness and ability to also utilise pupil skills. Given the complex nature of inclusive and peer group interactive pedagogy, teachers in training would need opportunities to reflect on their practices in the light of the existing research base.

There is a further issue here that cannot be ignored. Encouraging peer group interactive approaches in the classroom in an authentic way implies an acknowledgement of a constructivist, rather than transmission, view of learning. The implication here is to see all learners, including teachers and school administrators, as having active agency in learning and, therefore, to acknowledge the importance of the teacher as a reflective practitioner (Schön, 1983; 1987) and the school itself as a site of reflective practice to take account of this view.

5.3.3 Research

Rigorously designed research to evaluate teaching approaches to include children with special educational needs in mainstream classrooms is needed. The low populations involved mean that a series of controlled N=1 randomised interventions and/or controlled studies that incorporate the need for randomisation at the level of the school would be appropriate alongside research and development projects in order to ensure a high level of confidence in the generalisability of findings. Future research would benefit from a close focus on teaching approaches that effectively include and therefore contain data on pupil outcomes. Consideration should be given to indicators of pupil progress that are

rich and varied, and not just to indicators that are readily measurable. The strongest studies included in the review examined academic, social and other outcomes and their interrelationship, thus directing us to multi-faceted approaches that seem to work on a number of levels in real world contexts. It is somewhat artificial to study classroom pedagogy separate from school ethos and research addressing how the two relate would be valuable.

There is a small evidence base about how teachers use peer group interactive approaches, but this comes primarily from the USA and the primary school sector. Studies in the UK and secondary school contexts are needed. Similarly, the evidence base relates primarily to literacy, with some evidence related to mathematics, science and non-curriculum areas focused approaches. There is a gap in terms of the study of peer interactive approaches in other curriculum areas. Other teaching approaches contained within the descriptive map of this review, such as peer tutoring and adaptation of instruction, warrant further systemic study and in-depth review. Immediate attention might usefully be given to the studies that could not be retrieved in time for inclusion in this review.

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Appendix 1.1: Advisory Group Membership

International Advisers
Dr Rosie Le Cornu, University of South Australia
Dr Paid McGee, St Patrick's College, Dublin University
Mere Berryman, Pounamu Research Centre, Tauranga, New Zealand

User Group Advisers
Sally Bain, Teacher, Cressex School
Dr Katy Simmons, Chair of Governors, Cressex School
Students on Open University CPD courses (E831, E842)
Leeds SEN Advisory Group
Francis Mallon, Educational Psychologist
Pamela Banks, ITE, DeMonfort University
Dr Hilary Burgess, Centre for Research in Teacher Education, Open University
Dr Graham Fisher, Retired Head of Centre for Teachers' Continuing Professional Development at University of Greenwich
Dr Robin Richmond, Retired HMI and local education authority inspector in the area of special educational needs and inclusion

Review Team Members
Lini Ashdown, Open University
Dr Janet Collins, Open University
Dr Jacqui Dean, Leeds Metropolitan University
Professor Kathy Hall, Leeds Metropolitan University
Dr Melanie Nind, Open University
Jonathan Rix, Open University
Dr Kieron Sheehy, Open University
Dr Jon Tan, Leeds Metropolitan University
Dr Janice Wearmouth, Open University

Appendix 2.1: Inclusion and exclusion criteria

The mapping exercise *included* those studies that met *all* the following criteria:

Scope
- Include a focus on pupils who experience special educational needs of some kind (as defined above)
- Are conducted in mainstream classrooms
- Include pedagogical approaches
- Include an indication of pupil outcomes (as defined above)
- Are concerned with the 7–14 age range or some part of it

Study type
- Are empirical – exploration of relationships, evaluations or systematic reviews

Time and place
- Are written in English
- Are produced or published after 1994

Studies were *excluded* if they met *one* of the following Stage 1 exclusion criteria:

Scope
- (Exclude 1) Not focused on pupils who experience special educational needs of some kind (as defined above)
- (Exclude 2) Not conducted in mainstream classrooms
- (Exclude 3) Not concerned with pedagogical approaches
- (Exclude 4) Not indicating pupil outcomes (as defined above)
- (Exclude 5) Not concerned with all or part of the 7–14 age range

Study type
- (Exclude 6) Descriptions, development of methodology or reviews other than systematic reviews

Time and place
- (Exclude 7) Not written in English
- (Exclude 8) Not produced or published after 1994

Appendix 2.2: Search strategy for electronic databases

Keywords based on ERIC subject headings

Terms for pedagogical approach

pedagogy or instruction

teaching methods or classroom methods

educational practices or educational strategies

curriculum or elementary school curriculum or secondary school curriculum

classroom environment or learning environment

1–6

Terms for children 7–14 years old

students or pupils

disabled students or special needs students

elementary school students or primary school pupils

secondary school students or high school students or secondary school pupils

preadolescents or adolescents

primary schools or elementary schools

secondary schools or high schools

7–13

Terms for special educational needs

special educational needs or special education or special educational program

disabilities

15–16

Terms for mainstream schools

mainstreaming

inclusive education or inclusive education program or inclusive educational programs

Exclusion/limiting terms

infants or babies or toddlers or kindergarten children or preschool children

nursery schools or early childhood education or preschool education

adults or post secondary education

college students or university students

child abuse or child neglect

Record of electronic searching

ArticleFirst: Search strategy

Article First was searched on 7 January 2004 and 110 records were retrieved. The records were imported into an EndNote library using ArticleFirst (OCLC) filter.

(kw: mainstreaming

or (kw: inclusive and kw: education))

and (kw: disabilit*

or kw: special w education* w need*

or kw: special w need*

or kw: learning w difficult*)

not (kw: nursery

or kw: preschool*

or kw: kindergarten

or kw: early w year*

or kw: early w childhood

or kw: further w education

or kw: higher w education

or kw: universit*

or kw: adult*

or kw: adolescent*

or kw: policy

or kw: law

or kw: regulation*

or kw: legislation)

Australian Education Index (AEI): Search strategy

AEI was searched on 12 January 2004 and 200 records were retrieved. The records were manually imported into an EndNote library.

Search: (14 term(s):

Year of Publication=("1994" OR "1995" OR "1996" OR "1997" OR "1998" OR "...

AND 2 term(s): AEI Subject Headings=("SPECIAL NEEDS CHILDREN"

OR "SPECIAL NEEDS STUDENTS...

OR 2 term(s): AEI Subject Headings=("LEARNING DIFFICULTIES"

OR "LEARNING DISABILITIES")

OR 1 term(s): AEI Subject Headings=("DISABILITIES")

AND 2 term(s): AEI Subject Headings=("INCLUSIVE EDUCATION"

OR "INCLUSIVE SCHOOLS")

OR 1 term(s): AEI Subject Headings=("MAINSTREAMING"))

NOT NURSERY

NOT (EARLY CHILDHOOD)

NOT KINDERGARTEN

NOT ADULT?

NOT PRESCHOOL

NOT UNIVERSIT?

NOT (FURTHER EDUCATION)

NOT (HIGHER EDUCATION)

NOT LAW

NOT REGULATION?

NOT LEGISLATION

British Educational Index: Search strategy

BEI was searched on 14 January 2004 and 226 records were retrieved. The records were imported into an EndNote library using BEI (DIALOG@SITE) filter.

 (Year of Publication=1994

OR 1995

OR 1996

OR 1997

OR 1998

OR 1999

OR 2000

OR 2001

OR 2002

OR 2003)

AND (((BEI Subject Headings=SPECIAL EDUCATIONAL NEEDS

OR SPECIAL EDUCATIONAL NEEDS'

OR CHILDREN WITH SPECIAL EDUCATIONAL NEEDS

OR PUPILS WITH SPECIAL EDUCATIONAL NEEDS)

AND ((BEI Subject Headings=INCLUSIVE EDUCATION)

OR ((BEI Subject Headings=MAINSTREAMING)))))

NOT POLICY

NOT UNIVERSITY

NOT (EARLY YEARS)

NOT (EARLY CHILDHOOD)

NOT (HIGHER EDUCATION)

NOT (FURTHER EDUCATION)

NOT PRESCHOOL

NOT LAW

NOT LEGISLATION

ERIC: Search strategy

BEI was searched on 20 January 2004 and 506 records were retrieved. The records were imported into an EndNote library using using ERIC (DIALOG@SITE) filter.

 (Publication Year=1994

OR 1995

OR 1996

OR 1997

OR 1998

OR 1999

OR 2000

OR 2001

OR 2002

OR 2003)

AND (((ERIC Subject Headings=SPECIAL NEEDS CHILDREN

OR SPECIAL NEEDS STUDENTS)

OR ((ERIC Subject Headings=LEARNING DISABILITIES)

OR ((ERIC Subject Headings=DISABILITIES))) AND ((ERIC Subject Headings=INCLUSION (EDUCATION)

OR CLASS INCLUSION

OR INCLUSIVE EDUCATION

OR INCLUSIVE EDUCATION PROGRAMS)

OR ((ERIC Subject Headings=MAINSTREAMING))

AND ((Document Type=INFORMATION ANALYSIS (070))

OR ((Document Type=ERIC DIGESTS IN FULL TEXT (073))

OR ((Document Type=REPORTS--DESCRIPTIVE (141)

OR REPORTS--EVALUATIVE (142)

OR REPORTS--GENERAL (140)

OR REPORTS--RESEARCH (143))

OR ((Document Type=DISSERTATIONS/THESES (040)

OR DISSERTATIONS/THESES--DOCTORAL DISSERTATIONS

OR DISSERTATIONS/THESES--MASTERS DISSERTATIONS (0)

OR DISSERTATIONS/THESES--PRACTICUM PAPERS (043)

OR ((Document Type=JOURNAL ARTICLES (080))

OR ((Document Type=BOOK (010))))))

NOT (EARLY CHILDHOOD)

NOT (HIGHER EDUCATION)

NOT POLICY)

NOT PRESCHOOL

NOT ADULT?

NOT ADOLESCENT?

NOT LEGISLATION?

NOT POLICY NOT Q-W-0)))))

NOT LEGISLATION

Dissertation Abstracts: Search strategy

Dissertation Abstracts was searched on 22 January 2004 and 35 records were retrieved. The records were imported into an EndNote library using uq dissertation abstracts pq filter.

KEY(mainstreaming

or inclusive education

or inclusive school*)

and KEY(curriculum

or teaching practice*

or teaching method*)

and DATE(>=1994)

and DATE(<=2003)

NOT KEY(policy

or law

or regulation* legislation)

ECO: Search strategy

ECO was searched on 27 January 2004 and 97 records were retrieved. The records were imported into an EndNote library using connection filter.

(kw: mainstreaming

or (kw: inclusive

and kw: education))

and (kw: disabilit*

or kw: special w education* w need*

or kw: special w need*

or kw: learning w difficult*)

not (kw: nursery

or kw: preschool*

or kw: kindergarten

or kw: early w year*

or kw: early w childhood

or kw: further w education

or kw: higher w education

or kw: universit*

or kw: adult*

or kw: adolescent*

or kw: policy

or kw: law

or kw: regulation*

or kw: legislation)

PaperFirst: Search strategy

PaperFirst was searched on 28 January 2004 and 97 records were retrieved. The records were imported into an EndNote library using connection filter.

(kw: mainstreaming

or (kw: inclusive

and kw: education))

and (kw: disabilit*

or kw: special w education* w need*

or kw: special w need*

or kw: learning w difficult*)

not (kw: nursery

or kw: preschool*

or kw: kindergarten

or kw: early w year*

or kw: early w childhood

or kw: further w education

or kw: higher w education

or kw: universit*

or kw: adult*

or kw: adolescent*

or kw: policy

or kw: law

or kw: regulation*

or kw: legislation)

PsycInfo: Search strategy

PsycInfo was searched on 29 January 2004 and 276 records were retrieved. The records were imported into an EndNote library using PsycINFO (SP) filter

((((mainstream*

or inclusive education

or inclusive school*)

in DE)and((disabilit*

or learning difficult*

or special education* need

or special need*)

in DE))not((kindergarten

or preschool

or early year*

or early childhood

or further education

or higher education

or universit*

or adult*

or adolescent*

or policy

or law

or legislation

or regulation*)

in DE))

and (LA:PY = ENGLISH)

and ((PT:PY = ANNUAL-REPORT)

or (PT:PY = BOOK-TEXTBOOK)

or (PT:PY = CASE-STUDY)

or (PT:PY = CONFERENCE-PROCEEDINGS-SYMPOSIA)

or (PT:PY = EMPIRICAL-STUDY)

or (PT:PY = JOURNAL-ARTICLE))

and (PY:PY = 1994-2004) in the database(s) PsycINFO Weekly 2004/01 Week 1,

PsycINFO Weekly 2003/12 Week 5,
PsycINFO Weekly 2003/12 Week 4,
PsycINFO Weekly 2003/12 Week 3,
PsycINFO Weekly 2003/12 Week 2,
PsycINFO Weekly 2003/12 Week 1,
PsycINFO 2003/07–2003/11,
PsycINFO 2003/01–2003/06,
PsycINFO 2002/08–2002/12,
PsycINFO 2002/01–2002/07,
PsycINFO 2001 Part A,
PsycINFO 2001 Part B,
PsycINFO 2000,
PsycINFO 1999,
PsycINFO 1998,
PsycINFO 1996–1997,
PsycINFO 1993–1995,
PsycINFO 1990–1992,
PsycINFO 1988–1989,
PsycINFO 1985–1987,
PsycINFO 1978–1984,
PsycINFO 1967–1977,
PsycINFO 1872–1966

ISI Web of Science: Search strategy

ISI Web of Science was searched on 3 February 2004 and 161 records were retrieved. The records were imported into an EndNote library using connection filter

TS=(mainstream*

OR inclusive education

OR inclusive school*)

AND TS=(disabilit*

OR learning difficult*

OR Special education* need

OR special need*)

AND TS=(curriculum

OR teaching practice

OR teaching method)

NOT TS=(preschool

OR kindergarten

OR early year*

OR early childhood

OR further education

OR higher education

OR universit*

OR adult*

A systematic review of pedagogical approaches that can effectively include children with special   93
educational needs in mainstream classrooms with a particular focus on peer group interactive
approaches

OR adolescent*

OR law

OR policy

OR legislation

OR regulation*

OR health*

OR bab*)

Education-online: Search strategy

Education-online was searched on 4 February 2004 with 18 hits and five relevant records were retrieved. The records were manually imported into an EndNote library.

 (mainstreaming

OR "inclusive education"

OR "inclusive school*")

and (teaching methods

OR teaching practice

OR curriculum)

NOT (adult

OR higher education)

Educational Research Abstracts: Search strategy

Educational Research Abstracts was searched on 4 February 2004 and four records were retrieved. The records were manually imported into an EndNote library.

(mainstreaming

or "inclusive education")

and (disabilit*

or special education* need)

and ("primary school*"

or "secondary school*"

or "elementary school*"

or curriculum

or "teaching method*")

not (nursery

or preschool

or universit*

or adult*

or "early childhood"

or "special school*")

and 1995 – 2003

ChildData: Search strategy

ChildData was searched on 30 January 2004 with 534 hits, after screening 49 relevant records were manually imported into an EndNote library.

Keyword: inclusive education
AND General subject heading: disability

Index to Theses: Search strategy

Index to Theses was searched on 2 February 2004 with four hits. After screening, two relevant records were manually imported into an EndNote library.
 (mainstreaming
or "inclusive school*"
or "inclusive education")
and ("primary school*"
or "secondary school*")
and (curriculum
or "teaching method*")
and (1994 or 1995 or 1996 or 1997 or 1998 or 1999 or 2000 or 2001 or 2002 or 2003)

Internet: Search strategy

A search of the internet was conducted; 79 records were retrieved and entered manually into an EndNote Library.
(research OR study*)
+ (curriculum
OR teaching practice*
OR teaching method*)
+ (mainstream*
OR "inclusive education")
+ (disability*
OR learning difficulty*)
+ (primary school
OR secondary school
OR elementary school
OR high school)

Appendix 2.3: Websites handsearched

Centre for Studies in Inclusive Education:

http://inclusion.uwe.ac.uk/csie/csiehome.htm

National Association of Special Educational Needs: www.nasen.org.uk

International Special Education Congress: www.isec.org.uk

Down's Syndrome Association: www.downs-syndrome.org.uk

Mencap: www.mencap.org.uk

Appendix 2.4: EPPI-Centre Keyword sheet, including review-specific keywords

1. Identification of report
Citation
Contact
Handsearch
Unknown
Electronic database (Please specify.)

2. Status
Published
In press
Unpublished

3. Linked reports
Not linked
Linked

4. Language (Please specify.)

5. In which country/countries was the study carried out? (Please specify.)

6. What is/are the topic focus/foci of the study?
Assessment
Classroom management
Curriculum
Equal opportunities
Methodology
Organisation and management
Policy
Teacher careers
Teaching and learning
Other topic focus (Please specify.)

7. Curriculum
Art
Business Studies
Citizenship
Cross-curricular
Design and Technology
Environment
General
Geography
Hidden
History
ICT
Literacy – first language
Literacy further languages
Literature
Maths
Music
PSE
Phys. Ed.
Religious Ed.
Science
Vocational
Other curriculum (Please specify.)
The material does not focus on curriculum issues

8. Programme name (Please specify.)

9. What is/are the population focus/foci of the study?
Learners
Senior management
Teaching staff
Non-teaching staff
Other education practitioners
Government
Local education authority officers
Parents
Governors
Other (Please specify.)

10. Age of learners (years)
0–4
5–10
11–16
17–20
21 and over

11. Sex of learners
Female only
Male only
Mixed sex

12. What is/are the educational setting(s) of the study?
Community centre
Correctional institution
Government department
Higher education institution
Home
Independent school
Local education authority
Nursery school
Post-compulsory education institution
Primary school
Pupil referral unit
Residential school
Secondary school
Special needs school
Workplace
Other educational setting (Please specify.)

13. Which type(s) of study does this report describe?
Description
Exploration of relationships
Evaluation: naturally occurring
Evaluation: researcher-manipulated
Methodology
Review: systematic review
Review: other review

14. To assist with the development of a trials register please state if a researcher-manipulated evaluation is one of the following:
Controlled trial (non randomised)
Randomised control trial (RCT)

15. Have keywords been applied in all categories?

REVIEW-SPECIFIC KEYWORDING

RS4. What is the aim of the teaching approach?
(Tick *all* that apply.)

To raise academic attainment
To enhance social interaction/involvement
To improve behaviour

RS5. Who are the target group for the teaching approach?
(Tick *all* that apply.)

Pupils with physical disability
Pupils with autistic spectrum disorder
Pupils with learning difficulties
Pupils with specific learning difficulties
Visually impaired pupils
Hearing impaired pupils
All pupils
Others (Please specify.)

RS6. Who does the teaching?
(Tick *all* that apply.)

Regular, mainstream teacher
Special teacher and regular teacher in collaboration
Teachers with equal roles/responsibilities in collaboration
Learning support assistant
Peers
Other

RS7. What is the nature of the teaching approach researched?

Adaptation of instruction
Adaptation of materials
Adaptation of assessment
Adaptation of classroom environment
Behavioural/programmatic intervention
Computer based
Peer tutoring
Peer group interactive
Team-teaching
Other

RS8. What are the outcomes?
(Tick *all* that apply.)

Raised academic attainment
Enhanced social interaction/involvement
Improve behaviour
Mixed positive and negative outcomes
Other

RS9. Who judges the outcomes?
(Tick *all* that apply.)

Researcher
Teacher
Pupil
Parent
Support staff
Other

Appendix 3.1: Studies not obtained

Adams ZE (1995) Recent developments in the mainstreaming of blind students into lower secondary school class music. University of Western Australia. PhD thesis.

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Appendix 4.1: Summaries of studies included in in-depth review

Author, date, title and publication details

Beaumont CJ (1999) Dilemmas of peer assistance in a bilingual full inclusion classroom. *Elementary School Journal* **99:** 233–254.

Study context

Primary school in the USA (West San Francisco Bay)

Aims

- To study 'spontaneous, unstructured peer assistance interactions between 22 general education and 11 special education students during small-group and independent work periods' (p 233) in a blended, inclusive classroom, in particular the relationship 'between students' social concerns and their participation in and success with academic tasks' (p 237).

- To produce findings that are representative of a given population: 'the students reflected the demographic characteristics of the school and neighbourhood in which the classroom was located … I chose [the three focal] students with a variety of characteristics in order to identify features of inclusive environments that might be applicable to many different students' (p 238).

Design

- Part of a year-long ethnographic study

- In-class observation of spontaneous, unstructured peer assistance interactions; helping episodes; participation in and success with academic tasks

- Comparisons drawn between 11 students with a special school background and 22 students with a regular school background

- Three students from the group with a special school background used as the focus of observation (one seven-year-old and two nine-year-olds)

- Data were 'collected and analysed both simultaneously and sequentially using a constant-comparative method to generate categories, themes and hypotheses (Glaser and Strauss, 1967). I made both descriptive and reflective field notes throughout the study... weekly memos and interim summaries alerted me to emerging themes as data were collected.' (p 241)

- Interactions identified for future in-depth analysis framed by the questions: 'How did students and teachers view help in the classroom? What social and academic factors were involved in helping? Who helped who? Under what circumstances was help sought, given and received? Were consistent patterns evident in which students adopted teacher and learner roles? Was help effective?' (p 241)

Main findings

- The giving and receiving of help were complex, multi-layered phenomena.

- Students often used helping interactions to achieve social goals, but even so peer assistance was not always available.

- Access to peer assistance was unequal and depended on possessing necessary cognitive and linguistic skills, and on negotiating complex social relationships.

- Social and academic worlds were entwined and affected access to the curriculum for students with special needs.

- The teachers, via their classroom culture, encouraged helping and self-reliance; they viewed these as complementary, but students were confused by this.

- Special education students received help more often than regular students and offered help more often.

- Patterns of negotiation of social place were identified.

- Only 40% of helping episodes were successful.
- Special education students are in hierarchical competition with each other, while regular education students support each other equally.
- Regular education students support special education students, while special education students try to support regular education students but are often rejected.

Conclusions

- Social (inter)actions affect participation in curricular activities.
- Teachers rely on peer assistance to supplement their instruction.
- Students needed skills to negotiate complex social relationships.
- Students with special needs want to establish themselves as equals.
- Curricular and social interactions are complex and so are solutions to effective ways to deal with them.
- Special education students have less support in interactions.
- Teachers need to consider context and role when planning and need to understand, monitor and structure helping interactions.
- Students need to learn how to make bids for attention, how to ask precise questions (for clarification, etc.) and how to offer help without criticism.

Generalisability

- Case study design makes issue of generalisability problematic.
- Ethnographic approach means researcher's interpretations are inherent to the findings.
- There was no checking with other coders, observers or the participants themselves.

Trustworthiness

- Rich, detailed data are presented to support conclusions.
- Reviewers agreed that findings in relation to student interactions seem trustworthy, but the consequent recommendations for teacher behaviour to counterbalance the negative impact revealed in the findings must be treated as an unproven, although likely, hypothesis.
- Trustworthiness would have been enhanced with some co-coding and checking back with participants.
- Overall weight of evidence against question (a) was 'low'; case study design does not allow for evaluation of effectiveness in any rigorous way.
- Design is stronger for understanding how teachers enhance attainment and inclusion through interactions than whether such approaches are effective.

Study is sound (medium) with low weight of evidence for question (a) and medium weight of evidence for question (b).

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with special educational needs in mainstream classrooms with a particular focus on
peer group interactive approaches

Author, date, title and publication details

Blum HT, Lipsett LR, Yocom DJ (2002) Literature circles: a tool for self-determination in one middle school inclusive classroom. *Remedial & Special Education*. **23:** 99–108.

Study context

Middle school founded by local university and able to offer a curriculum tailored to the needs of all its pupils

Aims

- To determine the role of literature circles in helping all students assess their own abilities

- To measure students' perceptions of their reading abilities (comprehension, abilities to remember and explain what they read) and, additionally, the nature of students' involvement, depth of understanding and attitudes toward the discussion process

['Literature circles' have 'many forms, but essentially they are small, temporary discussion groups composed of students who are reading the same story, poem, article or book' (p 101).]

Design

- Researcher-manipulated evaluation

- Design of study: pre- and post-test, so lack of control (randomised or otherwise)

- Intervention lasted one semester and comprised literature circles within the language arts classroom.

- 'Initially each literature circle was composed of a teacher-selected group of five to seven students. Literature circles eventually evolved into groups determined by student-selected young adult novels supplied by the classroom teacher that were organized by themes' (pp 102–103).

- The target group comprised four students identified as having disabilities and three other struggling readers. Aaron, one student, formed a case study within the research and had been diagnosed as having attention-deficit/hyperactivity disorder.

- 'Students completed five-item survey...answering questions on a five-point continuum' about their self-assessment of their abilities as readers, at start and end of semester. Questions were: 1. How would you rate your reading ability? (high-low) 2. How would you rate your reading ability as compared to others in the classroom? (high-low) 3. I have trouble understanding what I read (strongly disagree-strongly agree) 4. I have trouble remembering what I read (strongly disagree-strongly agree) 5. I have trouble explaining to others what I read (strongly disagree-strongly agree).

- 'Observers scored rubrics on a four-point scale (1=non-proficient, 4=advanced)' (p 103) covering areas of: discussion contributions; used book quotes to support ideas; showed exceptional insight; interest, active listener; disagreed in appropriate manner; reinforced others' ideas; prepared for own task; made connections. Also space for anecdotal notations regarding students' interaction with peers and texts.

- Students' task organisers were scrutinised.

- Students were interviewed.

- Analysis of variance (ANOVA) was conducted on the students' self-assessments, comparing means for the target and wider groups before and after the semester of literature circles.

- Emergent themes from the interviews were identified.

- Comparisons of scores applied to discussion rubrics were made to determine the students' involvements in literature circles.

Main findings

- The students with SEN did have an understanding of their difficulties as readers.

- Prior to the literature circles, there were significant differences between the two groups' self-assessments of reading skills ($p<0.024$); difficulty in understanding text ($p<0.001$), remembering ($p<0001$) and explaining ($p<0.017$).
- After the literature circles this significant difference disappeared in all areas except for perception of reading comprehension.
- The case study student Aaron gained in confidence as a discussant and reader of literature.

Conclusions

- 'Students identified as having disabilities and struggling readers accurately assessed their reading difficulties and perceived an improvement in their reading skills due to literature circles' (p 106).
- Students were better able to understand and read literature.
- Students were willing to take risks and communicate within groups.
- Based on student and other interviews, literature circles were viewed as providing self-management skills for students.
- 'Literature circles provided an opportunity for students to engage in activities that promote self-determination' (p 106).
- Students had a sense of accomplishment necessary for self-esteem building.
- Social behaviours improved.
- Task organisers were used by students to focus their thoughts.
- Overall, 'literature circles are an appropriate accommodation for inclusive classrooms, and this approach promotes self-determination' (p 106).

Generalisability

Generalisability questionable:
- There is no indication of the representativeness of these qualitative data.
- Research is not randomised or controlled.

Trustworthiness

The reviewers identified obvious shortcomings leading to a low score for soundness of study:
- Qualitative data are given for one student only, with no rationale given for his selection.
- Interview and observational data collected alongside the surveys were not reported
- There is no discussion of possible confounding variables (e.g. selection bias, RTM, chance bias).
- Insufficient detailed findings are reported to support all the conclusions claimed.
- Insufficient information is given about research methods.

Study has low weight of evidence for question (a) and low-medium weight of evidence for question (b).

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with special educational needs in mainstream classrooms with a particular focus on
peer group interactive approaches

Author, date, title and publication details

Cushing LS, Kennedy CH, Shukla S, Davis J, Meyer KA (1997) Disentangling the effects of curricular revision and social grouping within cooperative learning arrangements. *Focus on Autism and Other Developmental Disabilities* **12:** 231–240.

Study context

Eighth-grade English class in a suburban intermediate school in Hawaii

Aim

To compare two conditions in order to understand how the social grouping element and curricular revision components of cooperative learning each affect classroom performance and investigate 'whether the social grouping component differentially affected participants' behaviour or whether the observed effects were due primarily to curricular revision' (p 232).

Design

ABABAB withdrawal design in which the condition with additional social grouping element (SGRC) [students organised into cooperative learning groups to carry out the given task] was alternated with the condition without it (RCO) [students with disabilities assigned to a specific peer for peer support] on a weekly basis with pre-/post-tests each week.

'Dependent variables included the percentage of time participants were actively engaged in classroom activities, weekly re-/post-test scores on the classroom curriculum, and the frequency and duration of social interactions between students with severe disabilities and their peers' (p 231).

Methods of data-collection included the following:
- Curriculum-based assessment (CBA): Class tests (short answer or multiple choice) were administered pre- and post-test each week of the alternating conditions (all peers).
- One to one interview (face to face or by phone): General and special education teachers were interviewed after the series on interventions/measures on the students.
- Observation: One-minute momentary time sampling procedure (for two 10–12 minute periods per day) was followed for observing students' active engagement (six target peers plus two disabled students, plus event recording procedure using Social Interaction Checklist to document social interactions between students with and without disabilities).
- Times and order of observation were randomly determined, with counterbalancing across all participants and class times. Occurrence of social support behaviours was recorded (greeting, information, access to others, material aid, emotional support and companionship).
- Post-hoc interviews were conducted with general and special educators as a social validity assessment.

For CBA, mean changes in performance plus range were calculated. For observation, mean (plus range) number and length of interactions per day were calculated, also mean (plus range) of different social support behaviours observed. For interviews, content analysis was conducted by 'two independent readers highlighting exemplary statements from each educator for each question posed. If disagreement occurred between readers, a third reader was involved and a resolution was obtained via group consensus' (p 235).

Main findings
- Weekly pre-/post-test scores: SGCO condition - mean improvement each 44%; RCO condition - mean percentage improvement of 72% (range 65%–77%) (p 235). Comparison of pre-test performances indicated a slight bias for the RCO condition.
- Active engagement: 'Overall, little systematic difference was obtained for any of the participants across the SGRC and RCO conditions. Our results suggest relatively high levels of active engagement for all participants across the two conditions' (p 235).
- Social interaction: '…no systematic differences between the SGRC and RCO conditions regarding the frequency and duration of social interactions. One disabled

> student received and provided slightly higher levels of social support in the SGRC condition... 'little difference across conditions was observed for the other (p 236).

- On social validity assessment: 'the educators preferred the SGRC condition, although they differed regarding which procedure was most effective... educators consistently reported that peers without disabilities preferred the SGRC condition' (p 236).

Conclusions

- There are some similarities and some differentials across the two conditions: 'both conditions occasioned high levels of active engagement by peers without disabilities and students with disabilities … hence, an individual's level of participation cannot account for the differentiation that occurred across conditions for other dependent measures i.e. (a) during the RCO condition, peers showed greater improvement on post-tests than during the SGRC condition; (b) one disabled student was more socially active during the SGRC condition; and (c) educators perceived peers as preferring the SGRC condition' (p 236).

- 'Our findings indicate that the benefit from curricular revision that accompanies cooperative learning is not being maximised within the social interaction format associated with cooperative learning groups' (p 236).

- 'When curricular revision is held constant across cooperative (SGRC) and individualized instruction (RCO), individualized instruction is more effective than cooperative learning arrangements for peers without disabilities' (p 236).

- The higher quality social interactions found for one of the students with disabilities may have occurred because in the SGRC condition '(a) more individuals were involved in the social interactions and (b) a greater variety of social support behaviours were situationally appropriate' (p 237).

- If peers dislike the RCO condition, it may not be viable as an effective procedure in the long term.

Generalisability

Reliability was addressed through randomly determining times and order of observation and counterbalancing across participants and class times. An additional observer independently recorded and inter-observer agreement scores were calculated.

Reviewers concluded results are possibly generalisable but only two students with disabilities were involved and their special needs and characteristics may not by typical. These students had a history of cooperative working and that may be an influential factor.

Research is not randomised or controlled.

Trustworthiness

The ABABAB design was intended to isolate the variables, which was very appropriate for the research aim. The greatest threat comes from the small sample size and possibility that the participants with disabilities cannot be said to be typical of all students with disabilities.
The study was highly trustworthy with medium weight of evidence for questions (a) and (b).

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with special educational needs in mainstream classrooms with a particular focus on
peer group interactive approaches

Author, date, title and publication details

Frederickson N, Turner J (2002) Utilizing the classroom peer group to address children's social needs: an evaluation of the Circle of Friends intervention approach. *Journal of Special Education* **36:** 234–245.

Study context

Primary classroom in England

Aim

To test the hypothesis that the classroom peer group acting as a social support network in the Circle of Friends approach can have a positive effect on the social competence of students whose behaviour is identified as challenging or worrying. The Circle of Friends intervention was adapted to support the process of including students 'with emotional and behavioural difficulties', in mainstream classrooms by involving the classroom peer group. The researcher aimed to measure changes in:

• Social acceptance/social inclusion in play of targeted children

• Children's self perceptions of scholastic competence, social acceptance, athletic competence, physical appearance, conduct and global self-worth

• Teachers' ratings of children's scholastic competence, social acceptance, athletic competence, physical appearance, conduct and global self-worth

• Children's and teachers' perceptions of the classroom learning environment

The study builds on previous qualitative case studies of the implementation of Circle of Friends (Newton *et al.*, 1996; Pearpoint and Forest, 1992; Taylor, 1996) and illuminative analyses of participant perspectives (Taylor and Burden, 2000). Previous evaluation studies of this intervention using qualitative case study methodologies indicate that the classroom social network can facilitate the acquisition and generalisation of appropriate classroom behaviours and social competence. The reliability of such studies in attributing change in student behaviour to the Circle of Friends intervention was thought questionable.

Design

A researcher-manipulated evaluation of an intervention, the Circle of Friends approach, designed to enhance social acceptance of classmates with special educational needs (emotional and behavioural difficulties).

Research design in two phases:

• In Phase 1, 20 students (19 boys, one girl) were randomly divided into two groups, a 'treatment' and a 'control', in a between-group design.

• In Phase 2, the control group became the treatment group and the scores of this group were analysed across both phases.

Data collected through:

• Socio-metric rating scale (Asher and Dodge, 1986)

• Self-perception profile for children (Harter, 1985)

• Teacher's rating scale of child's actual behavior (Harter, 1985)

• My class inventory (Fraser, 1982; Fraser and Fisher, 1986) of students' and teachers' perceptions of classroom learning environment

Main findings

Circle of Friends intervention had a positive impact on the social acceptance of the focus children in the classroom peer groups, but not on teacher perceptions of the same students' behaviour, nor on the focus children's perceptions of their social acceptance, nor on the general ethos of the classroom learning environment.

Phase 1	Effect size	Significance
Socio-metric rating by whole class	0.35	p<0.01

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		(statistically-significant)
Teachers' rating of child's conduct	0.01	p<0.70
		(non-statistically-significant)
Child's global self-worth	0.24	p<0.05
		(non-statistically-significant)
Phase 2		
Socio-metric rating by whole class	0.49	p<0.01
		(statistically-significant)
Teachers' rating of child's conduct	0.09	p<0.51
		(non-statistically-significant)
Child's global self-worth	0.42	p<0.05
		(statistically-significant)

Conclusions

Findings should be treated tentatively.

Generalisability

Issues of reliability and validity addressed through test instruments:

- Socio-metric rating scale (Asher and Dodge, 1986) has a reported test-retest reliability of 0.82 over two months with primary school students, and a test-retest reliability of 0.69 over five months.

- Harter's (1985) Self-perception profile for children has alpha reliability coefficients of 0.71 to 0.82.

- 'My class inventory' has internal consistency and discriminant validity of each MCI-SF scale with alpha reliabilities as follows: cohesiveness = 0.81; friction = 0.78; difficulty = 0.58; satisfaction = 0.68; competitiveness = 0.70 (Fraser and O'Brien, 1985).

- Statistical analysis of differences between groups with post-intervention scores as the dependent variable and pre-intervention scores as the covariate in each analysis were used to analyse the data, specifically: ANCOVAs of differences between groups, ANOVAs for within-group (Phase 2).

Additionally, in Phase 1 groups were matched in numbers of participants and participants were randomly allocated.

However, potential for generalising findings is limited owing to:

- Research not randomised or controlled

- The small size of the sample which constrained the power of the statistical procedures: 'Replication with a larger sample would be useful' (p 9).

- Variability in age of participants

- Gender imbalance

- The short period (six weeks) over which the intervention operated also limits the generalisability of findings.

- Limitations and differences in implementation of the intervention: Circles were run by graduate psychologists in Phase 1 and by teachers in Phase 2.

Trustworthiness

The reviewers note that the small sample size and differences between those who implemented the intervention in Phases 1 and 2 limited the potential for ruling out error and bias. The study is sound (medium) with medium-high weight of evidence for question (a) and medium weight of evidence for question (b).

Author, date, title and publication details

Goatley VJ (1996) The participation of a student identified as learning disabled in a regular education book club: the case of Stark. *Reading and Writing Quarterly 12:* 195–214.

Study context

Grade Five classroom in a neighbourhood elementary school in the USA

Aims

- To focus on a literature-based reading programme with four components: reading, writing, instruction and large group discussion in order to examine the progress in literacy acquisition and comprehension of text and in acquisition of social skills of one 'learning-disabled' male student in a mainstream classroom

- To examine what support is needed to support a 'learning-disabled' student's participation in mainstream literacy activities

Design

- Naturally-occurring evaluation

- Single case study of the participation of one student in the literacy activities of a mainstream class, most particularly in a book club group and of the level and type of individual support from a special education teacher that was required to support him.

The main types of data collected are as follows:

- Fieldnotes in classroom, two days per week for two terms

- Videotapes of physical movements, facial expressions and non-verbal behaviours

- Audiotapes and transcripts of book club meetings for one year

- Interviews with the student and his teacher

- The teacher's lesson plan book

- Written questionnaires (details unspecified)

- The student's written work: reading logs, 'think sheets', self-evaluation sheets, personal journal

Validity was addressed through triangulation of data:

- Discussion among researchers of patterns emerging from the data

- Comparisons made of data collected by different methods

- Data discussed with the student

Main findings

- The student had improved levels of reading comprehension and of writing, and improved social skills in the classroom.

- The importance of teacher intervention to guide interactions and organise groupings is recognised.

- The 'reflective role of the teacher is crucial for success of special education students in regular education classrooms' (p 212).

Conclusions

- Students who experience difficulties in learning 'must be allowed to participate in literacy activities that encourage multiple responses to literature and opportunities for social interaction with peers' (p 212) in the mainstream classroom.

- There is a crucial reflective and supportive role required of support teachers if students who experience serious difficulties in learning are to thrive in mainstream classrooms.

Generalisability

Generalisability questionable:

- Research is not randomised or controlled.

- There is too much generalisation about 'special education students' in mainstream classrooms that cannot be justified by a single case study.

Trustworthiness

Reviewers rated the soundness of the study as medium, with medium weight of evidence for question (b) but low weight of evidence for answering question (a). This was a single case study in which not enough detail was given of the student's background, the degree to which he experienced difficulties in learning or their nature, or the ways in which permissions for the study were negotiated.

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peer group interactive approaches

Author, date, title and publication details

Palincsar AS, Magnusson SJ, Collins KM, Cutter J (2001) Making science accessible to all: results of a design experiment in inclusive classrooms. *Learning Disability Quarterly* **24:** 15–31.

Study context

Four upper-elementary heterogeneous inclusive classroom settings in guided inquiry science instruction

Aims

Aims stated for two phases:

Phase 1: To 'investigate the engagement and learning of students identified as having learning disabilities and/or emotional impairments, as they participated in GIsML [guided inquiry supporting multiple literacies] instruction in inclusion classrooms' (p 18)

Phase 2: To examine the outcomes of GIsML instruction combined with teaching strategies developed out of Phase 1

(Guided Inquiry is an approach to science teaching where inquiry is guided by broad questions and proceeds through cycles of investigation stemming from more specific questions. Students repeat cycles of (first hand and second hand) investigation to refine thinking.)

The research questions seek to explore GIsML with students with special needs:

1. What are the opportunities and challenges that guided inquiry science instruction presents to students with special needs?

2. How do students with special needs respond to these opportunities and challenges? (In Phase 2)

3. How can teachers mediate students' participation in guided inquiry science instruction for the purpose of enhancing their engagement and learning?

4. What are the learning outcomes of advanced design and mediation of learning? (p 16)

Design

Naturally-occurring evaluation: 'design experiment, which refers in education to the engineering of innovative educational environments in which one simultaneously conducts experimental studies of teaching and learning over several iterations of the design of the environment' (p 16).

Experiment is multi-phased, but this article report on two phases:

Phase 1, observational: Multiple data were gathered and used to generate narrative case studies of identified SEN students' learning and inclusion in guided inquiry science classrooms. Phase 2: Strategies were implemented and observational, interview and artifactual data gathered. Additional quantitative data were obtained through formal written student assessments of achievement and the students' learning was evaluated. This phase addressed the third and fourth research questions.

Sampling frame is a previously established network of primary teachers and university researchers with an interest in enhancing inquiry-based learning of science. All the fourth- and fifth-grade teachers' classes in the GIsML network were chosen as sites for the study (p18). All students in each class participated (each class N=25–28), but within each class the students identified as having SEN formed the primary subjects for the study (in each class N=3–5).

Special needs of participants included 'learning disabilities', 'emotional impairment' and pervasive developmental disorder.

A number of data-collection methods were used:
- Curriculum-based assessment: Three formal written assessments; a standardised reading assessment (Gates-MacGinitie); a science assessment of understandings of key concepts; an assessment of students' attitudes towards and beliefs about the

nature of science and scientific reasoning (p 19)

- Focus group discussion with participating teachers

- One-to-one interview: Short individual interviews with identified children to ascertain their perspectives on lessons and to provide elaboration upon researchers' field notes

- Observation: Audio system used to record students' participation during whole-class activities; video camera recorded teacher interactions during both whole-class and small-group activities; field notes: one researcher per class observed teacher while other researchers noted the activities of identified SEN children, rotating attention from one child to the next in 15 to 20 minute intervals (p 18)

- Self-completion report or diary: in Phase 2, the four teachers completed journals in which they identified their practices and reflected on the process and outcomes of implementing these practices (p 25).

- Other documentation: Student artefacts including posters, science notebooks

Qualitative data collected in Phase 1 were analysed and triangulated to produce cases and claims, which informed the intervention in Phase 2. Statistical analysis was carried out on the quantitative data gathered pre- and post-study:

- Descriptive statistics (frequencies and means) were used as well as some inferential statistical analysis (e.g. parametric and non-parametric testing).

- Gates MacGinitie reading assessment was taken by all the students in the four classes. Non-parametric statistical tests (Mann-Whitney U, two-tailed) were used to discover whether there were any statistically significant differences in general student achievement across phases 1 and 2.

- The assessments of the students' science understandings were also analysed statistically, using non-parametric Kruskal-Wallis and Mann-Whitney U (two-tailed) tests.

- The non-parametric Wilcoxon Matched-Pairs Signed-Ranks Test (two-tailed) was used to determine statistical significance of the learning gains achieved by each group of students (i.e. in both Phases 1 and 2).

Student learning outcomes (quantitative) are also analysed in relation to their teachers' instructional practices and beliefs. To control for bias from confounding variables, pre- and post-testing, blind marking of assessments are undertaken. Mann-Whitney U (two-tailed) test applied to the Gates MacGinitie scores across both phases of the study to determine whether there were statistically significant differences between the two samples of students were undertaken. In both phases the teachers taught identical programmes of study but they were more experienced in guided inquiry in Phase 2 and the findings about the impact of the advanced teaching intervention 'are confounded' by this fact (p 25).

Main findings

Findings from Phase 1 qualitative data were presented as a table of claims:

- Participation of SEN students was influenced by the nature and amount of appropriate assistance/intervention received.

- Poor writers participated more fully when helped to document their thoughts; this was also the case when they were given the opportunity to document graphically.

- Environmental print and graphic documentation supported students who initiated using it; participating - access to materials, approval, support - was difficult for SEN students (in group and whole class settings).

- SEN students found it difficult to learn from large-group discussions without concrete support; one-to-one discussion with the teacher helped SEN students to engage with learning, develop thought and rehearse for sharing.

- Given appropriate social and cognitive supports SEN students were able to participate and express understanding.

Findings from the quantitative data: SEN students achieved significant learning gains in science by the end of Phase 2 of the study, as did the low-achieving and normally-achieving students.

Class teacher	Phase 1	Phase 2
Dunbar	Significant learning gains by identified students only p<0.0431	Significant learning gains by all groups of students
Jentzen	Significant learning gains only by 'normally-achieving' students p<0.0129	Significant learning gains by 'normally-achieving' and identified students
Lacey	Significant learning gains only by 'normally-achieving' students p<0.0277	Significant learning gains by low and 'normally-achieving' students
Lenowsky	Significant learning gains only by 'normally-achieving' students p<0.0045	Significant learning gains by low and 'normally-achieving' students

Conclusions

- The need for teachers to have deep knowledge of subject matter and to collaboratively consider the subject-specific nature of instruction.

- The practices responsible for success of the students in Phase 2 of the study were deemed exemplary practices but their implementation is demanding of time, energy and cognitive space.

- Social support that teachers provide students with SEN is considerable, and is especially important in inclusive settings.

- We need to understand 'the ways in which the teacher mediates student learning, particularly for students identified as having special needs' (p 29).

- Guided inquiry science teaching does, as hypothesised, present unique opportunities for SEN students, but their conceptual understanding in science only increased significantly when their teachers introduced advanced teaching strategies.

- The challenge for teachers was daunting, given the complexity of inquiry teaching; therefore support for teachers in planning and implementing such teaching is necessary.

- Neither general nor special teachers have a 'tradition of thinking about teaching, learning, or intervention in discipline-specific ways' and this is necessary if they are to plan programmes that support the learning of SEN children (p 30).

- SEN students in inclusive classrooms need social support, particularly in small-group activities.

Generalisability

Wide range of triangulated data sources suggests that reliability and validity of data-collection were considered. 'Each case generated was examined for confirming and disconfirming evidence regarding the claims that were generated, and the evidence for each claim was noted' (p 20). At the end of Phase 2 extensive data were analysed and used to complement each other in generating conclusions. Emphasis was on authenticity of the setting and the fact that it was a RandD project where teachers and researchers collaborated.

Generalisability questionable, however:
- Research is not randomised or controlled.

- Statistically, the small number of SEN students (17–19) make generalisability low.

- A very specific context applies here, although practitioners in inclusive settings would be able to relate to it well and in this sense (of case study methodology) generalisability is quite high.

Trustworthiness

No obvious shortcomings in the study (medium soundness). Descriptions tend to be 'light' and analysis 'heavy'. Claims appear to rest on very few relevant cases (only five of 17 SEN students). Methods are well described, but the complexity of the design intervention poses challenges with regard to replicability. Medium weight of evidence for both questions (a) and (b).

Author, date, title and publication details

Salisbury CL, Gallucci C, Polombaro MM, Peck CA (1995) Strategies that promote social relations among elementary students with and without severe disabilities in inclusive schools. *Exceptional Children* **62:** 125–137.

Study context

USA elementary school

Aim

To identify and examine 'effective practices/strategies present within these educational settings that general education teachers use to promote social relations among elementary students with and without severe disabilities' (p 126)

Design

Exploration of relationships: case study conducted in two phases:

- First phase involved interviewing and observing 10 teachers in two schools.

- Second involved focus group interviews with those 10 teachers plus other teachers in their school.

Analysis of data based on inductive methods.

Data-collection:

- One-to-one interviews: 10, semi-structured interviews of 60–90 minutes duration. Audio-taped and full transcriptions

- Observations: minimum of three hours of classroom observation with each of the 10 purposefully selected teachers. Data collected in form of field notes

- Focus groups: involved both purposefully-selected core individual teachers and other teachers within the schools. Number of interviews and participants not stated. Sixty minutes duration. Audio-taped and fully transcribed.

Main findings

Authors report on:

- Active Facilitation of Social Interactions, including examples of cooperative grouping, collaborative problem-solving, peer tutoring, the structuring of time and opportunity (pp 132–133)

- Development and utilisation of knowledge and awareness among students that promoted inclusion and the provisioning of need at a peer level (pp 133–134)

- Building a sense of community in the classroom

- The role of practitioners in 'modelling acceptance' as a way of communicating positive and inclusive attitudes/practices to children

- Organisational issues that impact upon inclusion

Conclusions

Authors conclusions contain discussion of the five main characteristics of effective inclusive practice as encountered in the research:

- Active facilitation of social interactions

- 'Turning it over to the kids' - empowering decision-making and peer awareness and provisioning for need

- Building community in the classroom

- Modelling acceptance

- Creating organisational supports

Generalisability

Generalisability questionable:

- Research is not randomised or controlled.

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- Small sample size and lack of experimental design suggest that conclusions beyond the sample itself 'must be interpreted with caution' (p 135). All of this is rather vague and somewhat unclear.

Trustworthiness

A study rated as 'low' in weight of evidence against both questions (a) and (b) as a result of a number of shortcomings:

- An inadequate account of the analysis means that readers are not able to judge the status of the evidence. The report seems high selective.
- Very little account is given of the collection and analysis of the observational data presented.
- Almost all evidence presented is interview data.
- The report is rather simplistic.
- The study reports at a rather general level, while identifying a number of children with specific needs. There is no analysis within this paper that considers any possible variations in practice based upon student need. Such detail would have provided a greater insight for other practitioners providing for particular children's needs and supporting inclusion.

While identifying details of practitioner expertise, career, etc., there is no comment/analysis on how such issues might impact upon their own confidence with which they approach the creation of positive, inclusive environments. Some of these points, and the implications for practice, are present in the concluding discussions but are not specific areas of analysis.

Author, date, title and publication details

Stevens RJ, Slavin RE (1995a) Effects of a cooperative learning approach in reading and writing on academically handicapped and non-handicapped students. *Elementary School Journal* **95:** 241–262.

Study context

Grades Two to Six in three suburban, working class schools in the USA

Aims

To 'extend previous research on the effectiveness of the CIRC program' (p 247):

- To investigate the effects of long-term implementation over two years
- To extend coverage of grades from third and fourth only to second through sixth grades
- To investigate more fully the 'academic and social outcomes of using CIRC as an approach to mainstreaming academically handicapped students' (p 248)
- To study 'the effects of strategic instruction provided in reading comprehension on students' metacognitive awareness and control over these processes' (p 248).

(CIRC is a cooperative learning approach to teaching elementary reading and language arts. It consists of three main elements: story-related activities, direct instruction in comprehension strategies, and integrated writing and language arts. 'The cycle of instruction in reading and language arts uses a cooperative learning type of cognitive apprenticeship' (p 243).)

Design

Case-controlled trial. Progress in reading and writing of 1,299 students in 31 experimental classes, using the CIRC program compared with progress in 32 control classes in four schools using traditional approaches to teaching reading and writing. The schools were matched on socio-economic and ethnic makeup and on measures of prior achievement in literacy levels, with an overall mean of 9% 'disadvantaged' as determined by number receiving free or reduced price lunch. The classes all included students with difficulties in learning whose progress was measured and compared separately. Overall special education population, including 'learning disabled' was 12%. In the experimental group 11% of total school population was identified as 'learning disabled' and 10% of control population was identified as 'learning disabled' (p 248).

The variables measured were as follows:

- Reading vocabulary
- Reading comprehension
- Language mechanics
- Language expression
- Metacognitive knowledge of reading processes
- Attitudes towards reading and writing

The main types of data collected were through: the California Test Form C to define the sample and California Test Form E to measure aspects of the sample as findings of the study. Data were collected on reading vocabulary, reading comprehension, language mechanic and language expression, metacognitive awareness and students' attitudes towards reading and writing.

Data analysed using the hierarchical linear model (HLM; Bryk *et al.,* 1988) to control for the clustering effects of the data and the fact that this was not a RCT, i.e. to 'resolve problems related to multilevel data' (p 251). Grade x treatment interactions were conducted to test for differential effects of the treatment at different grades. Pre-test measures were used to control for baseline differences between groups.

Main findings

'The first year results showed that CIRC students had significantly higher achievement in reading vocabulary and reading comprehension. Second year results indicated that CIRC students had significantly higher achievement in vocabulary, comprehension, and language expression. The CIRC students also exhibited greater metacognitive awareness then did their peers. Academically handicapped students who were mainstreamed in CIRC classes had significantly higher achievement in reading vocabulary, reading comprehension, and language expression than did comparable special education students taught in traditional settings. There were no significant effects on students' attitudes toward reading or writing' (p 241).

Academically handicapped students' achievement after the first and second years (p 253)

Year 1	Outcome measures	Effect size
	Reading vocabulary	+ 0.40*
	Reading comprehension	+ 0.31*
	Language mechanics	+ 0.23
	Language expression	+ 0.02
	* statistically significant p< 0.05	
Year 2	Outcome measures	Effect size
	Reading vocabulary	+ 0.37*
	Reading comprehension	+ 0.32*
	Language mechanics	+ 0.28
	Language expression	+ 0.36*
	* statistically significant p< 0.05	

All these effect sizes are small to moderate and positive, and five out of eight are statistically significant at p. 0.05 level. The statistically significant effects may be educationally significant even though they are small. This is a cluster trial and (unusually for an educational trial) they have adjusted for the nested nature of their data in their analyses.

Conclusions

Students (with and without difficulties in learning) in classrooms where teachers provide students with explicit instruction on reading comprehension strategies and use a writing process approach to teach writing and language arts, and where students are organised in cooperative learning teams on reading and writing activities make greater progress in reading vocabulary, comprehension, language mechanics and expression than students in traditional classrooms. The CIRC program can provide a vehicle for effectively mainstreaming academically handicapped students into regular education classes. 'The results of this study support the effectiveness of the CIRC program as a multifaceted, cooperative learning approach to elementary reading and language arts instruction. These results show that significant and positive effects on standardized measures of reading vocabulary, reading comprehension, and language expression can be obtained from an elementary literacy program' (p 254).

Generalisability

Reliability is addressed through use of standardised tests of reading. The test-retest reliability and internal consistency of the Index of Reading Awareness was also evaluated. In terms of validity, the test of metacognition was said to be an indirect and inferential, rather than a direct, measure of metacognitive processes. Issues associated with collecting data about the achievement of students who experience difficulties in learning were not discussed, however. This would have been useful, given that the measures were literacy-based and some students experienced difficulties in literacy acquisition and may have had difficulty with the test procedures and content.

Generalisability is explicitly addressed: '…the schools in this study served primarily suburban working-class neighbourhoods, with a small percentage of disadvantaged students. The question that remains is how applicable cooperative learning processes in general and CIRC specifically are to the problems of literacy instruction in urban school districts with much

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higher proportions of disadvantaged students and many more students reading below grade level. ... Now it seems clear that such a (multifaceted model of elementary literacy instruction) can be effective ... Finally, with respect to mainstreaming, this study is only beginning in the search to determine how much support is necessary to make mainstreaming effective'.

Generalisability is questionable, however, because research is not randomised or controlled.

Trustworthiness

The reviewers had very few concerns about the overall trustworthiness of this study rated as medium-high for soundness. The issue of attrition was not addressed and number of participants in post-tests was not discussed. The effect sizes for the whole population were small and this is not mentioned by the authors. Weight of evidence is medium-high for questions (a) and (b).

Author, date, title and publication details

Stevens RJ, Slavin RE (1995b) The cooperative elementary school: effects on students' achievement, attitudes, and social relations. *American Educational Research Journal* **32:** 321–351.

Study context

USA elementary schools in predominantly 'working-class' neighbourhoods, although indicators used (free or reduced price school meals) suggest significant variation across the schools (two to 20% of students identified as disadvantaged through these means).

Aims

To address a number of questions:

- Could cooperative learning be used on a broad scale in many subjects and over extended periods of time to fundamentally change the organisation of schools and classrooms?

- Would cooperative learning methods still be effective if they became the primary mode of instruction in schools, and would they maintain their effectiveness over time?

- Would schoolwide use of cooperative principles enhance the school's potential to successfully mainstream learning disabled students? (p 322)

Whilst the study emphasises a cross-curricula, whole-school focus, however, in the measures it utilises it has significant focus on aspects of literacy and mathematics:

1. Cooperative integrated reading and composition (CIRC)

2. Team-assisted individualisation (TAI) - Mathematics

Design

Researcher-manipulated evaluation involving sample of '1,012 students in second through sixth grades in five elementary schools', two treatment schools and three comparison (p 329).

Dependent variables are as follows:

1. Educational achievement (specifically reading, language and mathematics) (pre-test: California Achievement Test, Form C, post-test: California Achievement Test, Form E)

2. Attitudes towards, and perceived ability in, reading, language arts, and mathematics (measured (pre- and post-test on a three-point scale)

3. Social relations (specifically the frequency and incidence of friendships) measured (pre- and post-test, asking students to list the names of their friends in class and also measuring social acceptance)

A range of statistical methods and tests used to analyse the data:
1. Multi-level modelling using the hierarchical linear model

2. Conversion of standardised test score to z-scores

3. Regression analysis

4. Analysis of covariance (ANCOVA)

5. Analysis of variance (ANOVA) Effect sizes were calculated for each measurement domain and appropriate t, F, and p values are given throughout.

Main findings

1. Achievement in standardised tests
(a) Significant differences between treatment (Tr) and comparison (Cp) groups after first year with reference to reading vocabulary (p 334–335)

(b) Significant differences between Tr and Cp groups after second year with reference to reading vocabulary, reading comprehension, language expression and math computation

(c) Significant differences between learning disabled students of Tr and Cp groups after second year with reference to reading vocabulary, reading comprehension, language expression, math computation, and math application (p 336)

(d) Significant differences between gifted students of Tr and Cp groups after second year with

reference to reading vocabulary, reading comprehension, language expression and mathematics computation (p 339)

2. Attitude Measures

(a) After two years, students in Tr group had higher perceived abilities in reading and language arts (p 335).

(b) Learning disabled students had higher post-test measures in perceived abilities in reading and language arts (p 337).

(c) Highly significant difference for gifted students were recorded in terms of their perceived abilities in and attitudes towards language arts (p 340).

3. Social relations

(a) Overall, students in Tr group listed significantly more friends than those in Cp group after the two years of the study (p 335).

(b) For learning disabled students, those in Tr also listed more friends than their contemporaries in the Cp group after two years (pp 336–337).

(c) For gifted students, those in Tr also listed more friends than their contemporaries in the Cp group after two years (p 339).

Conclusions

- The programme's outcomes are difficult to ascribe to any one single element of cooperative learning.

- Cooperative learning approaches can be used to successfully enhance a school's ability to mainstream learning disabled students into the regular classroom. However, there are some conditions to this: '(a) the learning disabled students' being integrated into heterogeneous learning teams within classrooms, (b) the cooperative learning programs' using group goals based on individual accountability, and (c) the special education teachers' being scheduled to provide additional instruction and support to the learning disabled students in the regular classroom' (p 343).

- The positive effects of cooperative learning programs, such as CIRC and TAI, can be sustained over time.

- Cooperative learning approaches can promote social acceptance, particularly 'an environment of positive interdependence within the teams, where students depend on one another and where all must succeed in order for the group and any one member to succeed' (p 344).

Generalisability

The reviewers noted that significant percentage differences in control factor composition suggests highly variable contexts. Across the five schools (treatment and comparison), socio-economic background indicator ranged from 2% to 20%, percentage of ethnic minority students ranged from 4% to 15%, and percentage of learning disabled students ranged from 7% to 12%. The representiveness of this variation is not considered. However, it is implied that such variation is typical of elementary schools in working class neighbourhoods.

The authors provide adequate statistical detail to assess the reliability and validity of the measures they implement.

The authors point out the difficulty of disentangling the various elements of the programme. There are aspects of school culture that are affected by the programme and these might not be replicable in different contexts. Results could be considered significantly context-specific, particularly in the light of the range of potentially variable factors present (e.g. teacher effects, nature of special educational needs) and the limited contextual detail (e.g. ethnicity, gender, school/class size) that is sometimes available. Assessments of generalisability are problematic under these conditions. However, the length of the research study and the effects seen increase the likelihood that the effects seen here are generalisable.

Trustworthiness

There are some concerns with this study. The issue of attrition is unclear. As stated: '13.7% of the original students moved or otherwise did not stay in the participating schools for two years. In treatment schools, 11% of the students remained in the school for the entire two

years.' (p 333) The study further suggests that incomplete data were available in some cases, with only 873 students of the total 1,012 having 'pre-test data available in the district's records and were in the study for the entire two years' (p 333). Also, some measures adopted are very specific to areas of the curriculum (such as reading and mathematics), while the tenor of discussion suggests a more cross-curricula analysis and methodological receptiveness.

The authors highlight a number of limitations of the study as a whole, mainly as pointers for further research and refinement.

A sound (medium) study, taking adequate care in the reporting of positive associations, and the accounting for minimal or non-effects of the intervention. Further contextual information may have helped further in locating the findings within the specificity of the environments and individual contexts. Weight of evidence is medium for questions (a) and (b).

Author, date, title and publication details

Summey HK, Strahan DB (1997) An exploratory study of mainstreamed seventh graders perceptions of an inclusive approach to instruction. *Remedial and Special Education* **18:** 36–45.

Study context

Seventh-grade language arts classroom in suburban middle school in USA

Aims

To address two questions:

(i) How do seventh grade students with disabilities in an inclusive classroom perceive themselves as learners, as indicated by observations and interviews?

(ii) How do they respond to the Mindful Learning approach to language arts instruction, as indicated by observations, task interviews and general interviews?

Design

Case study of researcher-manipulated evaluation

Researchers worked with teachers to develop a programme called 'Mindful Learning' intended to incorporate a variety of learning styles, 'seven distinct ways of knowing' (p 38), based on Gardner's (1983) theory of multiple intelligences into a unit of classwork.

Students with disabilities, in mainstream class, were interviewed and observed to assess:

- How they saw themselves as learners
- How they responded to the Mindful Learning approach

At the start and end of the programme, assessments were carried out of students' skills in reading and use of strategies in answering questions.

Students were interviewed to ascertain perceptions of the new programme.

At the start and end of the study, the Flynt-Cooter Reading inventory was used.

At the end of the school year the reading portion of GOALS: a performance-based measure of achievement was given.

Data from these tests are implied to have been used to give a 'grade level' of Reading Level for each student (presented in a student profile table).

Students' perceptions of their own reading abilities were collected through interviews.

Main findings

- Mainstreamed students benefit from Mindful Learning activities.
- Eight out of 11 students demonstrated and articulated more functional reading strategies.
- Eight out of 11 completed classroom assignments in a proficient manner.
- All students reported some degree of involvement with Mindful Learning activities.
- Students enjoyed the Mindful Learning Unit.
- Students with poor functional reading skills could not engage with certain aspects of the assessments and programme. The programme itself was not designed to teach these skills.

Conclusions

- Curriculum enrichment is important.
- The amount of support seen in this study is atypical.
- Certain students, such as those in the study who did not make progress, would require additional specialised instruction in a separate setting to address learning needs**.**

Generalisability

Generalisability questionable:

- Research is not randomised or controlled – case study approach.

Trustworthiness

There is no attempt to establish validity or reliability of data-collection or analysis.

Several potentially confounding variables could have shaped the results obtained.

The programme was not designed to develop the basic skills that they needed, yet it was concluded that such students 'may require specialised instruction in a separate setting'. The recommendation that students who are critically behind their peers will need to be withdrawn to a separate setting is not based on the evidence presented.

Study is sound (medium) but with low weight of evidence for question (a) and (b).

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