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A systematic review of whole class, subject-based pedagogies with reported outcomes for the academic and social inclusion of pupils with special educational needs

Review conducted with the support of the SEN Review Team, International Advisers, User Group Advisers and SEN advisory group

Technical report written by Kieron Sheehy and Jonathan Rix, with Janet Collins, Kathy Hall, Melanie Nind and Janice Wearmouth

EPPI-Centre
Social Science Research Unit
Institute of Education
University of London

EPPI-Centre report no. 1701 · February 2009

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Explains the purpose of the review and the main messages from the research evidence

TECHNICAL REPORT

Includes the background, main findings, and full technical details of the review

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These can be downloaded or accessed at
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List of abbreviations

CPD	Continuing professional development
EPPI-Centre	Evidence for Policy and Practice Information and Co-ordinating Centre
DfEE	Department for Education and Employment
DfES	Department for Education and Skills
ITE	Initial teacher education
LD	Learning disabilities
LEA	Local education authority
PGCE	Postgraduate certificate in education
SEN	Special educational needs
SSPBL	Strategy-supported project-based learning
TDA	Training and Development Agency
UNESCO	United Nations Educational, Scientific and Cultural Organization
WoE	Weight of evidence

Abstract

Schools across the world have responded to international and national initiatives designed to further the development of inclusive education. In England, there is a statutory requirement for all schools to provide effective learning opportunities for all pupils (QCA, 2000) and children with special educational needs (SEN) are positioned as having a right to be within mainstream classrooms accessing an appropriate curriculum (SENDA, 2001). Previous reviews which have sought to identify classroom practices that support the inclusion of children with SEN have been technically non-systematic and hence a need for a systematic review within this area has been identified (Nind et al., 2004; Rix et al., 2006). This systematic literature review is the last in a series of three.

The overall review question for this three-year programme of systematic reviews is as follows:

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

The overall review question was identified by the Review Team and agreed with advisory groups, who represented the intended audience for the review: those involved in initial teacher training and classroom teachers. This question guided the interrogation of research databases in each year. The in-depth review question for the third year of the programme asks the following:

What is the nature of whole class, subject-based pedagogies with reported outcomes for the academic and social inclusion of pupils with special education needs?

Initial screening

The initial search was carried out using a variety of keyword terms, drawn from the educational terminology of different countries, and from the

British Education Thesaurus. Various electronic databases, citation indexes and internet sites were searched. All identified studies were imported into EndNote bibliographic software, and then into the EPPI-Centre systems. The same keywords and databases were used across the three years of the review programme: 2004 (review published in 2004), 2005 (review published in 2006) and 2006 (review published in 2009). The studies were screened by two independent screeners, with a sample being assessed by the EPPI-Centre link person for quality-assurance. This screening examined titles and abstracts against eight agreed inclusion/exclusion criteria, which defined the subsequent scope of the review. The studies had to focus on pupils aged 7-14, with special educational needs, in mainstream classrooms. They had to include pedagogical approaches, offer indications of pupil outcomes, and be empirical (in that they involved the collection of data). They also had to be written in English and published after 1994. The cut-off date for the third review was 31 March 2006.

Following the initial screening, copies of the selected papers were sought and given a more detailed reading, with the exclusion/inclusion criteria being re-applied. This second reading also involved two independent screeners, with quality assurance provided by the EPPI-Centre link person. The papers that passed through this process were then keyworded using two sets of keywords. The first set used the EPPI-Centre (2003) Keywording Strategy (version 9.7), while the second set used a review-specific strategy. This second set of keywords was expanded during each year of the review by the research team to reflect the focus of that year's question. The keywording was carried out by pairs of reviewers working independently and then moderating their findings. This process was again sampled for quality-assurance purposes by the EPPI-Centre link person. The keywording process created a 'descriptive map' of the studies, which gave an overview of the studies and details of their aims, methodologies, interventions, theoretical orientations and outcomes.

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The in-depth review

Drawing on the identified needs of the users and discussions across the three reviews, it was decided that the focus of the third year's in-depth question should be the nature of whole class, subject-based pedagogies. This has relevance to mainstream classroom teachers who are compelled to deliver identified curriculum subjects and to accommodate a diverse range of learners. The in-depth review question for the third year of the programme asks: 'What is the nature of whole class, subject-based pedagogies with reported outcomes for the academic and social inclusion of pupils with special education needs?'.

As in 2004 (published in 2004) and 2005 (published in 2006), this review (2009) did not focus on programmatic interactions, nor on studies that merely described classroom practices, without some form of evaluation or exploration of the variables within the setting. These priorities were transposed into new exclusion / inclusion criteria and applied to studies within the descriptive map. Given the interlinked nature of the three years of the review, these new criteria were added to those from previous years.

Data extraction

The studies identified for the in-depth review were now closely assessed by two independent reviewers. Data- extraction was carried out using generic EPPI-Centre guidelines and the review-specific guidelines created by the course team. Any differences between the two reviewers were discussed and moderated. A central component of the two sets of data was the assessment of the quality of studies and weight of evidence supplied by their findings. The reviewers assessed the relative weight of evidence in relation to the soundness of the studies; the appropriateness of research design and analysis relative to the review questions; and the relevance of the study's focus the review's questions. A judgment of the overall weight of evidence was arrived at through the combination of weightings identified in relation to quality of execution, appropriateness of design, and relevance of focus. The assessments of the reviewers were used by the main authors to frame the synthesis of the studies, and the subsequent conclusions and recommendations. A structured narrative was created, based on the emerging central themes and used to address the question of the nature of whole class, subject-specific pedagogies which are effective for children with special educational needs in mainstream classes.

Across the three years of the review programme, 3,462 papers were identified for potential inclusion, of which 2,982 were screened on the basis of their titles or abstracts (following the removal of duplicates). The most common exclusion criteria which studies met at this stage were as follows: not concerned with pedagogical approaches (32%)

and not being an empirical study (24.6%). In the 2006 review, 170 abstracts and titles were initially screened and 86 failed to meet the inclusion criteria. The full articles were requested for those that met the inclusion criteria, or where more information was needed. These articles were combined with an additional 44 papers which were not obtained in the 2004 and 2005 review years (Nind et al., 2004; Rix et al., 2006). The 120 papers which formed this combined group (eight were not obtained) were assessed. Consequently, 25 studies were added to the systematic map, giving a total of 134 studies (68 studies from 2004, 41 studies from 2005, and 25 studies from 2006).

The 134 studies within the systematic map were distributed among pairs of reviewers within the team for keywording. They were keyworded using two keywording databases, both supplied and run by the EPPI-Centre. Of the 134 studies, 68 had been keyworded previously in 2004 and 41 keyworded previously in 2005. The majority (88.46 %) of the studies were identified through electronic databases, originated in the United States of America, and were researcher-manipulated evaluations (78%). The focus of 85% of the studies in the systematic map involved teaching and learning, while the most common teaching approach within the studies was the adaption of instruction (78%) and peer group interactive (44%). The forms of interactions identified in the studies showed an emphasis on verbal (83%) and written interactions (59%).

Of the 134 studies, 11 met the criteria to pass into the in-depth review. Each of these 11 studies was carried out in the schools within the United States of America, and nine were within primary schools or their equivalent. In terms of curriculum area, five concerned literacy-first language, two focused on history, two on social studies and one each on mathematics and science.

Synthesis and findings

Synthesis of these studies led to the identification of the following five emerging themes:

- pedagogic community
- social engagement being intrinsic to the pedagogy
- flexible modes of representing activities
- progressive scaffolding of classroom activities
- the authenticity of classroom activities

The results of the synthesis in relation to this question can be summarised as follows.

This pedagogy is mediated by a teacher who is part of a 'teacher community', either within the school or, more often, from outside the school. The teacher's pedagogical practice is supported by this

community with a shared model of how children learn. Therefore the teacher has an understanding not only of how to teach a curriculum subject but also of why they are doing so. The pedagogy gives importance to the social engagement of learners and includes activities in which social interaction is seen as the means through which student knowledge is developed. The learning activities within this pedagogy use different modalities, making the subject knowledge accessible to a diverse range of learners. Further, the development of learners' understanding occurs through the planned scaffolding of the subject's cognitive and social content. In doing this, the teacher uses activities which the learner finds meaningful.

The scope of this systematic literature review inevitably has limitations. No material before 1994 was included and teaching approaches used to include pupils in the early years or post-14 were not considered. A further limitation is the national context of the studies assembled for the in-depth review - reflecting the systematic map.

All the in-depth studies were US-based with none originating in the UK, thus having obvious difficulties for generalising to the situation in this or other countries. A more serious limitation concerns the strength of the evidence base overall. Only four studies were judged to have a high weight of evidence overall in relation to the in-depth review question and the limited number of participants within the various studies renders generalisability across large populations problematic. Within these limitations, the review findings, in terms of the themes identified, have strong surface validity and this suggests relevance for the intended audience in guiding and supporting the development of inclusive classroom practice. The review highlights the importance that teachers, early in their career, connect with a pedagogic community within which they can reflect upon and develop inclusive whole class teaching.

CHAPTER ONE

Background

This chapter sets out the aims of the review and its underpinning rationale. It describes the policy and practice context, and considers previous reviews within the field. A background to the authors and funding bodies is also given, together with an outline of the different users for whom it is intended.

1.1 Aims and rationale for current review

This review represents the third year of a progressive and developing review programme that has been designed to span a three-year period and utilise the expertise of the research team in relation to the Statement for Inclusion. The project focuses upon effective pedagogical approaches in use in mainstream classrooms with children with special educational needs (SEN), aged 7-14 years. The first and second reviews have focused on significant interactions that are found in research on inclusive classrooms (Rix et al., 2006; Nind et al., 2004). This third review takes a wider view than the previous years in order to investigate the nature of whole class, subject-based pedagogies that have reported outcomes for the academic and or social inclusion of children with special educational needs.

In the first review, the authors carried out a systematic literature review (Nind et al., 2004) which identified and described studies that had investigated pedagogical approaches that can effectively include children with special educational needs in mainstream classrooms. The nature of the systematic review process meant that suitably close attention could only be paid to one aspect of the papers drawn together through the first year's search. Therefore, at the in-depth review stage, the review-specifically focused on a subset of the studies identified to examine the use of peer group interactive approaches. It was considered that this would be the first of three reviews intended to clarify the evidence from empirical research regarding effective practice in relation to these pedagogical approaches in which there are numerous environmental and interacting variables.

The second review expanded the focus of the previous year to investigate the nature of the interactions between teachers, support staff and pupils (Rix et al., 2006). It was felt that there was a particular need to explore more fully the individual interactions, between teachers and students, through which learning occurs as there is a tendency to neglect this aspect of pedagogy in relation to effective inclusion (Skidmore, 2004). It highlighted the powerful role the teacher plays in shaping interactions and influencing learning opportunities through interactions. It also discussed the nature of these interactions and the affordances they offered for inclusion. According to the second review:

Those teachers who see themselves responsible for fostering the learning of all promoted higher order interaction and engaged in prolonged interactions with pupils with special educational needs, while teachers who see others (e.g. specialist teachers or special education teachers) as primarily responsible for these pupils engaged in interactions that were of a non-academic and low level nature (Rix et al., 2006).

The third review, undertaken in 2006, develops the aspect of 'fostering the learning of all', as a means of identifying effective pedagogy for children with special educational needs in mainstream classes. The belief in a need for special (i.e. different) pedagogical approaches for children 'with' special educational needs has been widely critiqued (e.g. Norwich and Lewis, 2001; Hart, 1996). However, many mainstream teachers feel ill-prepared and feel that they lack specialist skills and training sufficient to work with students with learning difficulties (Carrington, 1999). Teachers often see a 'specialist and different' pedagogy as the preferred way of teaching children with special education

needs (Ring and Travers, 2005). These beliefs are reflected in reports (for example, in OFSTED, 2004) that many schools still do not see themselves as having the necessary skills, experience or resources to effectively provide for children with special educational needs.

This is despite evidence that many children with special educational needs are making good progress in mainstream classes (Nind et al., 2004). Ainscow (2000) argues that the expertise to teach all pupils effectively is already present in schools, but unrecognised. The latter argument suggests that effective 'inclusive approaches' do exist with mainstream classes and there has consequently been a growing focus upon the teaching practices that can be, and are, more broadly used by mainstream practitioners. This is an increasingly important issue. The proportion of statemented pupils in mainstream nursery, primary and secondary schools increased from 57.2% in 1997 to 61.4% in January 2001 (DfEE, 2001). Since over 50% of children with special educational needs are in mainstream schools in England, it is vital that:

Any discussion of pedagogy and SEN needs to consider pedagogic practices in ordinary primary and secondary schools (Corbett and Norwich, 2005, p 21).

Examining the issue of why schools are different in their approach and confidence regarding inclusive education, David Skidmore (Skidmore, 2004) identified one discriminating factor as being of particular importance. His analysis suggested that schools whose pedagogy is inclusive (i.e. successfully accommodates a diversity of learners and including pupils with special education needs) achieve this by beginning from a consideration of the curriculum and subject lessons, and subsequently develop practices therein which suit a diversity of learners. This was in contrast to an approach which began from considering a child's individual needs and impairments. Such a starting point consequently developed pedagogy built on a deficit view of the child.

In considering the approach being developed for this review, it is useful to reflect on Dyson's (1999) suggestion that there are primarily two groups of discourse in operation in the field of inclusive education. The first group is that of rationale, that is, a way of identifying the basis for inclusion. The second group is realisation, which is concerned with turning inclusion into a reality. The direction taken in the third review is one of pragmatic realisation.

The review seeks to identify from the research literature aspects of what inclusive educational practice looks like and to identify the nature(s) of inclusive pedagogies. Therefore this review seeks to identify pedagogies through which the subject of the lesson is taught to the whole mainstream class and that have produced positive outcomes for children with special educational needs.

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. Therefore, at the start of the third review, there remained a need for considering the nature of whole class approaches to teaching which could engage all learners with the curriculum and thereby 'include' children with special educational needs within the mainstream classroom. This reflects the needs and experience of this audience

The third review develops and extends the focus of the preceding two years and investigates whole class, subject-based pedagogies. Directing the third year towards this end has relevance to mainstream classroom teachers who are compelled both to deliver identified curriculum subjects and also to accommodate a diverse range of learners (Harrison, 2001). It contributes to a sound evidence base of effective practice to support teachers seeking to develop inclusive pedagogies within their classroom. Figure 1 indicates how the third review fits within the three-year programme of reviews.

Figure 1 The relationship between the first, second and third systematic reviews

Overall review question: What pedagogical approaches can effectively include children with special educational needs in mainstream classrooms?

First review 2004	Second review 2006	Third review 2007
In-depth review question	In-depth review question	In-depth review question
Question (a): Does a pedagogy involving a peer group interactive approach effectively include children with SEN in mainstream classrooms?	What is the nature of the interactions in pedagogical approaches with reported outcomes for the academic and social inclusion of pupils with SEN?	What is the nature of whole class, subject-based pedagogies with reported outcomes for the academic and/or social inclusion of pupils with special education needs?
Question (b): How do mainstream classroom teachers enhance the academic attainment and social inclusion of children with special educational needs through peer group interactions?		

As can be seen in Figure 1, the three reviews develop the overall descriptive map during each year and answer a particular in-depth question. The map reported in this review thereby supersedes those of previous years.

The aims of the third review are as follows:

- To update the descriptive map of research (completed in the first and second reviews) of studies undertaken in the area of effective pedagogical approaches that enable children with special educational needs to be included in mainstream classrooms
- To 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
- To synthesise the data from studies that focus in detail on the whole class, subject-based pedagogies that include pupils in mainstream classrooms

1.2 Definitional and conceptual issues

Special educational needs became part of the UK educational and legislative landscape through its inclusion within the Warnock Report (DES, 1978). However, the term has come to be used in ways not originally intended. It is typically associated with an in-child deficit as opposed to contextualised difficulties with learning, while being used as a bureaucratic means of identifying and distributing funding, professional support and other resources. It has come to be linked with dependency (Corbett, 1996) and not the wants or rights of individuals (Roaf and Bines, 1989).

The continued use of the notion of pupils with special needs encourages a belief in specialised teaching approaches and strategies (e.g. Howley and Kime, 2003), despite the lack of a substantive research base (Norwich and Lewis, 2001) and even though such approaches typically result in segregation of pupils (Skrtic, 1991). Many, both within the inclusion movement and beyond, would also argue that good practice is inclusive practice, providing teaching for all (Hart, 1996; Thomas and Loxley, 2001).

The tension that exists between mainstream and specialised or segregated provision has added to the tensions surrounding an understanding of how to include pupils effectively. Recent government documents have allowed the term inclusion to embrace segregated provision as part of a drive for wider social inclusion (DfES, 2003) adding to the confusion and contradictions that already existed (Jordan and Goodey, 2002). Inclusion has been more typically linked to sociological

and organisational paradigms in which schools restructure their ways of working to overcome inequitable practices and organisational deficiencies (Skidmore, 2004). To include pupils effectively, it is necessary to focus upon the quality of learning and participation within mainstream schools.

Mittler (2000) has argued that a pedagogy which is inclusive is not something additional that is attached to existing pedagogy, but that it must develop from sound pedagogy which can become good pedagogy for a more diverse group of learners.

1.2.1 Definitions

The first and second reviews (Nind et al., 2004; Rix et al., 2006) scrutinised and appraised research studies in the light of the questions indicated in 1.6, and were based upon the following understanding of the key terms embedded within the key question.

The term 'effectively include' indicates a concern with the extent to which particular pedagogical approaches can be shown to impact positively upon aspects of the learning and participation of children with special educational needs: for example, their attainment levels, progress, attitude, confidence and/or skills. Effectiveness was identified through keywording, deeming an approach to be effective if an outcome was a positive impact upon learning, behaviour or social interaction. In the first review (Nind et al., 2004), as anticipated, each of the studies scrutinised employed its own criteria upon which pedagogical approaches were deemed 'effective'.

This review focused closely upon the criteria used in the studies and the extent to which they had been made explicit. For some, effectiveness was seen in terms of tangible pupil achievements. Others relied on the ratings of teachers, teaching assistants, parents and the pupils themselves. It was anticipated that a common thread connecting the studies in the review would be a judgement that the pedagogies employed were 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. Central to this evaluation of efficacy is the systematic way in which that effectiveness has been measured and reported. The nature of the systematic process depends on the research form, but, within this context, it needs to be explicitly explained and justified.

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. This usage is maintained in the third review.

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. This is seen 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 to be a need for special means of access to the curriculum, a special or modified curriculum, or a need to attend particularly to the social structure and emotional climate for learning (Weddell, 2003). In the included studies, the pupils' needs were 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, this was not included in the initial literature review reported here.

The second review (Rix et al., 2006) scrutinised and appraised research upon the following understanding of these additional key terms embedded in its key question.

The term 'interactions' is used in the broadest sense to mean all forms of intentional communication which engage two or more individuals. This includes any verbal or non-verbal communication mediated through all possible channels, including such forms as the written word, signs (e.g. a visual timetable), signing (e.g. Makaton) and technological devices (e.g. switches, whiteboards).

The third review included additional keywords relevant to the focus of 2006 review and which were added to the database under 'Review 3 keywords'.

1.2.2 Pedagogy and learning

'Are learning aims set for the whole class?' The studies could be classified as in four ways: an explicit statement of whole class learning aims; an implicit statement of whole class learning aims; learning aims stated some but not all children; and no learning aims being stated.

An identical classification of explicit/implicit/for some/not stated was used to assess 'Are the learning tasks subject specific?'

The final addition considered 'Is there pedagogy in practice?'. Here, the researchers looked for the following:

1. explicit evidence of pedagogy in practice, in which teaching practice is stated and described
2. implicit evidence of pedagogy in practice, where reference is made to pedagogy which is not clearly stated or described-but may be described elsewhere; for example in another publication being referenced from the current research being considered;

3. no reference to pedagogy in practice

In discussion of pedagogies, the term 'social constructivism' is used. This is a theory of knowledge and knowledge production (Oates et al., 2005) and is a perspective through which the review tries to understand the nature of learning as a social phenomenon.

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

1.4 Research background

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

- issues concerned with appropriate responses to behavioural concerns and behaviour management in schools (Harden et al., 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 students in the cultures, curricula and communities of schools (Dyson et al., 2002).

These reviews have focused on either a more specific sub-category of children with SEN or with all children including those with SEN. There was 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. Norwich and 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) asked '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 had sought to establish the effectiveness of particular pedagogies or the impact of school actions on pupil participation, there had been no previous systematic review prior to the first review (Nind et al., 2004) that could answer the question of what pedagogical approaches could effectively include children with SEN in mainstream classrooms. Nind et al. (2004) identified a small evidence base to suggest that peer group interactive approaches were effective for the inclusion of children with special educational needs in mainstream classrooms, both in terms of social and academic participation.

The study also identified the importance of the co-construction of knowledge through participation in the classroom learning community. The first and second reviews (Nind et al., 2004; Rix et al., 2006) carried out by this Review Group developed a database of research in the area of pedagogical approaches. Within the sphere of studies with reported outcomes for children within special educational needs in mainstream classes, the first review (Nind et al., 2004) examined peer group interactive approaches in depth and second review (Rix et al., 2006) went on to consider the nature of interactions within inclusive classrooms.

The third review draws upon evidence which suggests that inclusive pedagogy begins from consideration of the nature of what is being taught and how it is delivered. In taking this stance, a tension is highlighted. This perspective is in contrast to approaches which begin from a perspective of individual deficit. Indeed, the term 'children with special educational needs' can itself be seen as originating from, and supportive of, a deficit model of learners (Nind et al., 2004; Skidmore, 2004).

1.5 Authors, funders and other users of the review

As the major agency in the state with oversight of teacher education, the Training and Development Agency (TDA, formerly 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 research team, training core team members and assuring the quality of the systematic research process. Funding of the review by the TTA was also supported by the Open University, Leeds Metropolitan University and Southampton University.

The Review Group comprised established academics with expertise in special and inclusive education, initial teacher education (ITE) and continuing professional development (CPD), as well as 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. Members of the Review Group had previously co-researched and co-authored on several research projects, including systematic reviews. The Group's involvement with initial and continuing teacher education means that they are 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 (Appendix 1.1).

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, better understand how to adopt teaching approaches that are effective for diverse groups, fostering positive social and academic outcomes

1.6 Review questions

The overall review question for this three-year programme of systematic reviews is as follows:

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

In deciding upon this question, answers are sought to important subsidiary questions, such as the following:

- What kinds 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?

Prior to the third review's in-depth review, a descriptive mapping of the studies was constructed, extending the map created in the previous two years of the project.

For the third review, in the in-depth review, the focus is on a subset of studies identified in the systematic map of the preceding reviews to answer the question:

What is the nature of whole class, subject-based pedagogies with reported outcomes for the academic achievement and/or social inclusion of pupils with special educational needs?

The conceptual framework has been introduced previously and frames inclusive pedagogy as something that arises from sound pedagogy for 'mainstream' learners, which can become good pedagogy for a more diverse group of learners (Mittler, 2000). The relationship to curriculum access is central to this process, as difficulties in learning are identified in schools where a student potentially fails to meet the requirements of a given curriculum area. To include pupils with special needs, it is therefore useful to consider pedagogies that can successfully deliver curriculum areas within mainstream classes.

CHAPTER TWO

Methods used in the Review

This chapter begins by briefly outlining how users were involved in the review. It sets out the methods of the review, detailing how terms were defined and how the focus was narrowed. It explains the criteria that were used to include and exclude studies, and describes the methods used for finding studies. It also describes the screening and the quality-assurance process. There follows a description of the progression from a mapping of the studies to an in-depth review. An account is offered of how the Review Group assessed the quality of studies, how they conducted a synthesis of the evidence, and how they applied the quality-assurance mechanisms. As this is the third year of the review and a number of papers in years 1 and 2 that also pertain to this third year have already been gathered and evaluated, the following description of methods must be seen as an explanation of a process that has occurred three times. Consequently, this account of method is itself largely a replication of that in previous reports

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. The Review Group 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 includes 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 follow dialogue with potential users of the research. International consultants Dr Rosie Le Cornu (Australia), Dr Paid McGee (Republic of Ireland) and Ms Mere Berryman (New Zealand) advise 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 the 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. In this third year of the review, the in-depth question was developed from notes kept during years 1 and 2. The question was drafted and circulated electronically for comment to all reviewers.

2.2 Identifying and describing studies

2.2.1 Defining relevant studies: inclusion and exclusion criteria

This first part of the research process was carried out in 2004 as part of the first review and a systematic map of the research literature was produced. Subsequently, the same approach was carried out in the reviews of the second and third years, updating the systematic map of the previous review, so as to identify those studies that had been

published in the intervening months, or which had subsequently become available.

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

Scope

1. Include a focus on students who experience special educational needs of some kind (as defined in section 1.2)
2. Are conducted in mainstream classrooms
3. Include pedagogical approaches
4. Include an indication of student outcomes (as defined above)
5. Are concerned with the 7-14 age range or some part of it

Study type exploration of relationships

6. Are empirical evaluations or systematic reviews.

Time and place

7. Are written in English
8. Are published after 1994

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

Scope

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

Study type

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

Time and place

7. (Exclude 7) Not published in English
8. (Exclude 8) Not published after 1994

The particular contexts examined in the review were those whose impact could be demonstrated in classrooms in mainstream schools serving the

7-14 age range. The particular age-range chosen, in the UK context, encompassed primary and middle schools and the first years of secondary schooling (key Stages 2 and 3 in England and Wales). In the USA, this encompassed 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.

In each review, the Review Group focused on those studies that had been published after 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 (Code of Practice, DfE, 1994). This enabled a systematic review 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. In the third year, the Review Group updated the systematic literature search and endeavoured to access those papers that had been unavailable for inclusion in the first or second year review.

The question for the in-depth review was as follows:

What is the nature of whole class, subject-specific pedagogies, with reported outcomes for the academic and/or social inclusion of children with special educational needs?

Inclusion and exclusion criteria for the in-depth review were drawn up and applied as follows:

The in-depth review would include those studies that met all the following criteria:

- learning aims were set for the whole class
- learning tasks were subject-specific
- pedagogy in practice (i.e. teaching practice is stated and described)

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

- learning aims were not set for the whole class but may be set for individual children
- learning tasks were not subject specific
- no pedagogy in practice (i.e. teaching practice was not stated or described)

The Review Group focused on as wide and as comprehensive a range of research studies as possible 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 commonly studies would involve case studies of a single classroom or school, sometimes as part of bigger projects.

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2.2.2 Identification of potential studies: search strategy

The updated searches were carried out between November 2005 and March 2006. The following electronic databases and citation indexes were interrogated:

- The Educational Research Information Clearinghouse (ERIC)
- The British Educational Index (BEI)
- PsychINFO
- Australian Education Index (AEI)
- British Library Public Catalogue (BLPC)
- COPAC
- Dissertation Abstracts
- Education Collection Online (ECO)
- Education Research Abstracts
- Papers First
- Child Data
- Education On-line
- Google Scholar

A selection of key internet sites was searched (see Appendix 2.3), including research organisations, government and voluntary organisations. 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' might 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 inclusion
- terms to indicate that a study was about pedagogical approaches
- terms to indicate that the study involved pupils aged between 7 and 14

The key terms were developed in collaboration with the specialist librarian, who advised on the use of indexing languages for specific databases. These are tabulated in Appendix 2.

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

Inclusion and exclusion criteria were applied successively to (i) titles and abstracts and (ii) full reports. Full reports were obtained for those studies that appeared to meet the criteria or where there was insufficient information to be sure. These reports were entered into a second database. The inclusion and exclusion criteria were re-applied to the full reports and those that do/did not meet these initial criteria will be/were excluded.

This review used the systematic review procedures as described in the EPPI-Centre documentation to ensure that our review was systematic within the resources available.

Screening of the citations identified in the searches proceeded through a series of graduated filters. Initially a database (EndNote 1) was made of all the studies retrieved from the electronic databases, electronically processed online journals and searches of websites. The inclusion and exclusion criteria were then applied to the titles and abstracts of reports in this database. The screeners met to moderate their findings, and re-examined those abstracts about which they did not agree. Of the citations, 10% were assessed by the EPPI-Centre link person for quality-assurance purposes.

Full reports were obtained for those citations that appeared to meet the inclusion criteria. These reports were entered into a second database (Endnote 2). Full copies of all reports in this second database which appeared to meet the criteria were obtained and the criteria was re-applied so as to exclude any which, upon fuller scrutiny, did not meet the inclusion criteria. A list of those reports which met the inclusion/exclusion criteria was then drawn up and all reports meeting the inclusion criteria were placed in a third database (Endnote 3).

2.2.4 Characterising included studies

All the studies which remained after the application of the inclusion criteria 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. Keyworded studies were added to the existing map created for the third review (which was itself an updated version of the map of the first and second reviews). This helped to build the 'descriptive map' of the studies in the review and provided a full and

clear picture of the kinds of research that had been conducted together with details of their aims, methodologies, interventions, theoretical orientation, outcomes and so on. This process does not assess the quality of the studies. All the keyworded studies have been added to the larger EPPI-Centre database, REEL, for others to access via the website.

2.2.5 Identifying and describing studies: quality-assurance process

Screening

Screening of titles, abstracts and full-text documents was conducted by two independent screeners. A random sample from the 2006 sample was screened by the EPPI-Centre link person. This consisted of 13 titles and abstracts in addition to 8 papers. Uncertainties concerning the inclusion of individual reports were shared and resolved.

Keywording

As quality assurance, two studies were keyworded in 2004 by all members of the Review Group (N=5), allowing for deliberation over the process and clarification of the guidance and protocol. In 2005, all members of the Review Group met to evaluate the keywording process of the previous year and to clarify the process for the subsequent review. In 2006, the Group followed the same process of evaluating the previous years keywording process as a preparation for that year's subsequent keywording activity

Each study was then keyworded by two members of the Review Group, working first independently and then comparing their decisions before coming to a consensus. Seven members of the Group conducted this process, using a staggered pair method. In the first year, less experienced members of the Review Group were paired with experienced or trained keyworders/reviewers. In year 3, all members had acquired experience of keywording. A random sample of eight studies was keyworded independently by the EPPI-Centre link person; this sample was also keyworded independently by two members of the Review Group. Decisions were shared and discussed between the three keyworders.

2.3 In-depth review

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

During the course of the mapping in the current review, the same initial question (What pedagogical approaches can effectively include children with special educational needs in mainstream classrooms?) was used as in the preceding two years. This enabled the Review Group to access

those studies that were unavailable in 2004 (review published in 2004) and 2005 (review published in 2006), and any others which had subsequently been published or otherwise become available. The inclusion and exclusion criteria from previous years were appropriate for the initial screening of titles and abstracts.

The Review Group identified the question for this year's in-depth review (What is the nature of whole class, subject-based pedagogies with reported outcomes for the academic achievement and/or social inclusion of pupils with special educational needs?), since collaboration and co-operation had been the focus of the previous two years and the need to look more specifically at whole class pedagogies was suggested. Whole class pedagogies have been suggested and debated as being a crucial part of the inclusion of pupils with special educational needs within the mainstream. The nature of this practice in delivering curricula within the classroom was seen as being highly pertinent to the needs of this audience. Therefore, the in-depth review sought to gain an understanding of the nature of such approaches, where these had included children with special educational needs. On the above basis, inclusion and exclusion criteria on the scope of the studies for the in-depth review was drawn up and applied as described in 2.2.1.

2.3.2 Detailed description of studies in the in-depth review

The in-depth review describes in much more detail the characteristics of the included studies. It describes and also assesses the findings of each study as well as its methodological quality. The concern at this stage was to clarify the study findings, assess their reliability and discover the contribution that the study makes to the answering of the review question. As is clear from this collaborative approach, the data-extraction and quality-assessment process was based on relevant EPPI-Centre documentation. EPPI-Centre guidelines helped to focus on the aims and rationale of each individual study, its research question(s) and its methods and design. In addition, a set of review-specific questions designed by the research team was used.

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 five studies data-extracted by the EPPI-Centre link person for quality-assurance purposes. The quality of studies and weight of evidence was assessed using the EPPI-Centre data extraction framework, as well as the review-specific framework.

The EPPI-Centre guidelines and software assisted the investigation of the reliability and quality of each study meeting the inclusion criteria by

focusing 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 in answering the study question(s)

B: Appropriateness of research design and analysis for addressing the question of the specific systematic review

C: Relevance of the particular focus of the study for addressing the question of the specific systematic review

D: 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

Weight of evidence judgements were made with regard to each of the above criteria. The outcome of each judgement was a rating of high, medium or low with regard to each criterion. 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 in the table below.

2.3.4 Synthesis of evidence

This synthesis attempted to bring together the findings of the individual in-depth studies so as to enable the drawing of tentative conclusions and recommendations. As in the first review (Nind et al., 2004) and second review (Rix et al., 2006), since the studies used mixed and qualitative methods, a meta-analysis of a statistical nature was ruled out. It has been agreed that for this audience and purpose the most appropriate

synthesis would take the form of a structured narrative describing any overall, cross-study patterns/themes that were detected in the characteristics of our individual studies and in their findings. Themes derived from those studies were subjected to rigorous interrogation via EPPI-Centre data extraction.

The initial themes/patterns were framed by seeking to understand the nature of the pedagogies being revealed in the review. The individual in-depth analyses were examined and tentative synthesis of the studies made. As in the second review:

Themes derived from those studies were subjected to rigorous interrogation, using the EPPI-Centre data-extraction tool. The process of synthesising was a recursive one in that the identification of themes and the development of the narrative within each theme involved the two lead researchers, individually and collaboratively, in revisiting and interrogating the data-extraction details. In addition, themes were shared, discussed and justified with members of the broader Review Group. (Rix et al., 2006, p14)

In the synthesis process, the weight of evidence which was allocated to each study was considered. Studies in which the Review Group had greater confidence, in relation to other studies, exerted a greater influence in the synthesis and recommendations for practice, policy and further research.

2.3.5 In-depth review: quality assurance process

Screening

Pairs of independent reviewers applied the inclusion/exclusion criteria to all the studies in the descriptive map to elicit studies that satisfied the requirements for inclusion in the in-depth review.

To gain a HIGH overall WoE D rating	<ul style="list-style-type: none"> The ratings for WoE A-C all have to be HIGH.
To gain a MEDIUM-HIGH overall WoE D rating	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> The ratings for WoE A-C all have to be LOW; or WoE B is a low rating.

Data extraction

Studies in the in-depth review were data-extracted and quality appraised using the standardised EPPI-Centre tools, and the review-specific questions.

As quality assurance, each study was independently reviewed and data-extracted by two different members of the Review Group or a member of the Review Group and the EPPI-Centre link person. Only when the independent in-depth analysis of the studies was completed would each internal pair of reviewers meet to isolate and resolve any differences of opinion and interpretation. Any disagreements between the reviewers were further discussed and resolved.

Additionally, 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, was recorded and described in brief accounts of the papers and detailed summaries of the studies.

CHAPTER THREE

Identifying and describing studies: results

In this chapter, the Review Group describes the ways in which they searched for studies, identified those studies which they would keyword, and narrowed these down for the systematic map. They also describe the outcomes of the searching and keywording processes, presenting data from both the EPPI-Centre keywords and the review-specific keywords. Being the third year of the review process, they were building upon the methods that had been established in previous years, as well as the data that had been collated. The data presented here represents the outcomes of this three-year process.

3.1 Studies included from searching and screening

Figure 3.1, summarises the filtering of papers from searching through systematic map to final synthesis. In this year's review, the same methods, definitions and criteria were followed as in the previous two years, in order to draw upon papers from all years within the synthesis. Figure 3.1 shows the searching and screening process for 2006 (this review, 2009) and indicates the number of studies contributed to the systematic map by each of review's three years.

Figure 3.1 represents the screening and selection process. 170 abstracts and titles were initially screened for the 2006 review and 86 failed to meet the inclusion criteria. The full articles were requested for those that met the inclusion criteria, or where more information was needed. These articles were combined with an additional 44 papers which were not obtained in the 2004 and 2006 review years. The 120 papers which formed this combined group (8 were not obtained) were assessed. Consequently, 25 studies were added to the systematic map giving a total of 134 studies (68 studies from 2004, 41 studies from 2006 and 25 studies from the current searches). These 134 studies were assessed and consequently 11 studies met the criteria to pass into the in-depth review.

The databases were searched using the keywords identified in Appendix 2. The same keywords were used in all three reviews. The same databases were

Key to Figure 3.1

Stage 1 criteria

- Criterion 1 = Not focused on special educational needs
- Criterion 2 = Not conducted in mainstream classroom
- Criterion 3 = Not concerned with pedagogical approaches
- Criterion 4 = Not indicating pupils outcomes
- Criterion 5 = Not all or part of 7-14 year age range
- Criterion 6 = Not empirical study or systematic review
- Criterion 7 = Not written in English
- Criterion 8 = Not produced or published after 1994

In-depth criteria

- IDC 2.1 Not focused on teaching and learning
- IDC 2.2 Not focused on outcomes for the academic achievement and social inclusion of pupils with special educational needs
- IDC 2.3 Not focused on mainstream teacher working independently
- IDC 2.4 Not an evaluation or exploration of relationships
- IDC 2.5 Not avoiding programmatic interactions
- IDC 2.6 Learning aims were not set for the whole class but may be set for individual children.
- IDC 2.7 Learning tasks were not subject-specific.
- IDC 2.8 No pedagogy in practice (i.e. teaching practice was not stated or described)

searched too, but the creation of Google Scholar within the 2005 search period meant that this database was included, despite its absence in the first year.

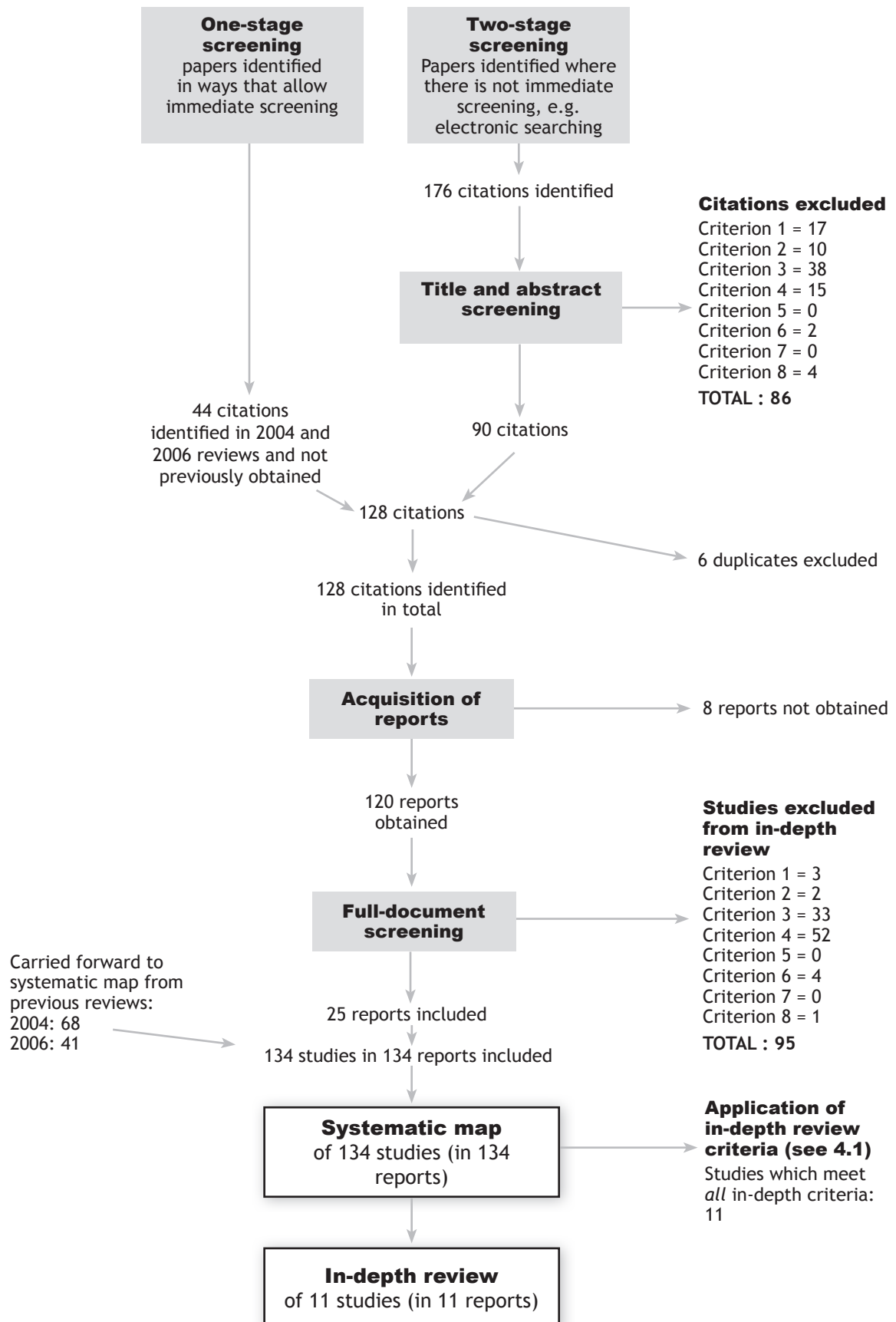
Figure 3.1 Filtering of papers from searching to map to synthesis

Table 3.1: Database sources of titles (represented as percentages)

	% in 2004 (N = 2,095)	% in 2006 (N = 1,197)	% in 2006 (N = 170)	Total % (N = 3,462)
Article First	4.71	2.76	0.00	3.80
Australian Education Index	8.56	6.43	6.47	7.72
British Education Index	9.67	18.63	1.76	8.18
Child Data	22.85	0.00	0.00	13.83
Dissertation Abstracts	1.50	0.58	9.41	1.57
ECO	4.15	0.00	0.00	2.51
Educational Research Abstracts	0.17	0.00	0.00	0.001
ERIC	21.65	70.09	3.53	37.51
Education Online	0.21	0.00	0.00	0.13
Index to Theses	0.09	0.00	0.00	0.05
Psychinfo	11.81	0.00	0.00	7.15
ISI web of science	6.89	0.00	2.94	4.31
Socsitation	0.21	0.00	0.00	0.13
Paper First	4.15	0.00	0.00	2.51
Internet	3.38	0.00	0.00	2.06
Google Scholar	0.00	1.50	0.00	0.52
Handsearch	0.00	0.00	75.88	3.73

The database origins of papers identified for screening (including duplicates) are shown in Table 3.1. and Figure 3.2. There was a comparatively even spread of papers across the different databases in 2004, but, in 2005, the majority of papers came from one database, ERIC. In the time between the two review periods, ERIC had obtained funding to upload a great many papers from right across the period, relevant to the second review, 1994-2005. The far smaller contribution made by the other databases in that year's search demonstrated that there had been few papers added to the databases between the first review (2004) and the second review (2006). This trend continued in the third review. From 2006, therefore, an additional focus was given to handsearches, which yielded the majority of new papers for this year of the review.

In total, 170 titles and abstracts were screened in the year three review. (In previous years, some abstracts were screened and included but not available. Some of these full articles arrived in time for the third year. These abstracts are not included here in the third year figures but the full articles are included within the third year and indicated later.)

As indicated in section 2.2.3, this review used the systematic review procedures as described in the EPPI-Centre documentation to ensure that the review was systematic within the resources available. Screening of the citations identified in the searches proceeded through a series of graduated filters. Initially a database (EndNote 1) was made of all the studies retrieved from the electronic databases, electronically processed online journals and searches of websites. The bibliographic data from the searches was imported into this first

database (EndNote 1); duplicate papers were then identified and excluded. In 2004, 250 duplicates were identified; in 2006, 262 duplicates were identified. The figures for 2006 do not include the papers used in the review for 2004; these were all excluded automatically. 26 duplicates were identified by hand in 2004, none were identified in 2006 and 2009.

The inclusion and exclusion criteria were then applied to the titles and abstracts of reports in this database (see 2.2.1). In 2004, this was a two-stage process, as the Review Group felt there was a degree of leniency in the first stage. In 2006 and 2009, drawing upon the Group's greater experience, the exclusion criteria were applied in a single stage. In 2004, 1,845 papers were screened; in 2006, 967 papers were screened. In 2009, 170 papers were screened. This increasing lower figure reflects the efficient screening of articles carried out in each preceding year.

Screening of the abstracts was carried out by a pair of reviewers, with 10% of the abstracts being moderated by another member of the Group. The screeners moderated their findings, and re-examined those abstracts for which they disagreed. For each item, exclusion was based on the highest criterion initially identified by the reviewer. Items were excluded automatically if identified by both the screeners. If there was a lack of information upon which to base decision, then the paper was included for more detailed analysis.

As indicated in section 2.2.3, full reports were obtained for those citations that appeared to meet the inclusion criteria. These reports were entered

Table 3.2: Exclusion at abstract screening

	Exclusion criteria	Only 2004	Only 2005	Only 2006	Total 2006	% only 2004	% only 2005	% only 2006	% Total 2006
Criterion 1	Not focused on special educational needs	176	90	17	283	12.63	10.84	19.77	12.25
Criterion 2	Not conducted in mainstream classroom	221	140	10	371	15.85	16.87	11.63	16.06
Criterion 3	Not concerned with pedagogical approaches	489	215	38	742	35.08	25.9	44.19	32.12
Criterion 4	Not indicating pupils outcomes	172	61	15	248	12.34	7.35	17.44	10.74
Criterion 5	Not all or part of 7-14 year age range	66	23	0	89	4.73	2.77	0.00	3.85
Criterion 6	Not empirical study or systematic review	266	300	2	568	19.08	36.14	2.33	24.59
Criterion 7	Not written in English	1	1	0	2	0.07	0.12	0.00	0.09
Criterion 8	Not produced or published after 1994	3	0	4	4	0.22	0	4.65	0.17
Total		1,394	830	86	2,310				

into a second database (Endnote 2). Full copies of all reports in this second database which appeared to meet the criteria were obtained and the criteria was re-applied so as to exclude any which, upon fuller scrutiny, did not meet the inclusion criteria. A list of those reports which met the inclusion/exclusion criteria was then drawn up and all reports meeting the inclusion criteria were placed in a third database (Endnote 3).

In 2004, 75% of papers were excluded at this screening stage. In 2006, 85% were excluded. This increase seems to be a result in the increased number of descriptive studies being identified. This could be due to the increased reliance upon the ERIC database which presents a broad range of sources, including many for professional development.

In 2004, 1,394 papers were excluded (along with 26 more duplicate references); in 2006, 830 papers were excluded; and, in 2009, 86 papers were excluded. This makes a total of 2,310 papers excluded across the three years. This resulted in 450 potential includes in 2004, 137 potential includes in 2006 and 84 potential includes in 2009. Across the whole period, there were 671 potential includes. In 2004, however, 64 papers had not been obtained by the cut-off date. These papers had not been given their second screening and so were included in the 2005 potential includes. This brought potential includes for 2005 up to 201.

In 2009, 50.56% of papers were excluded at this screening stage. For criteria 1, 3, 4, 5, 7 and 8, the relative amount of exclusions are similar to

preceding years. The overall decrease in the relative number excluded, in comparison to preceding years, can be seen as reflecting the influence of criterion 2 'not conducted in mainstream class' and criterion 6 'not empirical study or systematic review'.

Once again, in the third review, a cut-off date for retrieval of the full documents for screening was set as 31 March 2006. Of the 170 titles to be screened, only two were not obtained by this cut-off date. In 2009, some 'late arrivals' from the previous two years were added: that is, abstracts which were classed as included but for which the full papers had not arrived in time. These potential includes were added for their second full article screening.

From the 2004 review, 31 articles were added to the 2009 articles for screening.

From the 2006 review, 13 articles were added to the 2009 articles for screening.

In 2009, there remained some outstanding requests which break down as shown below.

Outstanding requests from the 2009 review

	2009	2006	2004
Papers	1	2	4
Theses	5	0	10
Reports	1	0	7

Table 3.3: Exclusion at full document screening

	Exclusion criteria	Only 2004	% Only 2004	Only 2006	% Only 2006	Only 2009	Total 2009	% Total 2009
Criterion 1	Not focused on special educational needs	6	1.90	4	4.44	3	13	2.47
Criterion 2	Not conducted in mainstream classroom	33	10.48	10	11.11	2	45	10.62
Criterion 3	Not concerned with pedagogical approaches	96	30.48	21	23.33	33	150	28.89
Criterion 4	Not indicating pupils outcomes	63	20.00	25	27.78	52	140	21.73
Criterion 5	Not all or part of 7-14 year age range	17	5.40	7	7.78	0	24	5.93
Criterion 6	Not empirical study or systematic review	100	31.75	23	25.56	4	127	30.37
Criterion 7	Not written in English	0	0.00	0	0.00	0	0	0.00
Criterion 8	Not produced or published after 1994	0	0.00	0	0.00	1	1	0.00
Total		315		90		95	500	

These items were therefore excluded from full document screening.

The list of material documents that were not obtained for screening can be found in Appendix 3.1.

At this third stage of screening the same exclusion criteria were applied after a detailed examination of the studies.

90 papers were excluded in 2006. 315 had been excluded in 2004, meaning that, across these two years of the study, 405 papers (involving 412 studies) were excluded. In 2009, 96 studies were excluded at this stage. There was one study which did not arrive in time.

As can be seen in Table 3.3, there were only relatively small differences in the percentages of papers excluded under each criterion across the years.

The full document screening from 2009 resulted in 25 papers being included in the systematic map. These papers were combined with the papers that had been included in the systematic map for 2004 and 2006, resulting in a final systematic map of 134 studies. These 134 studies were now distributed among pairs of reviewers within the team for keywording.

The 134 studies were keyworded using two keywording databases, both supplied and run by the EPPI-Centre. The first database used the EPPI-Centre core keywording strategy, while the second used a review-specific strategy designed by the Review Group. This second keywording strategy was initially designed in 2004, but was updated and expanded in 2006. This was continued in 2009.

3.2 Characteristics of the included studies (systematic map)

Of the 134 studies within the 2009 systematic map, 68 had been keyworded previously in 2004 and 41 keyworded previously in 2006.

3.2.1 Identification of studies

Table 3.4 shows the method of identifying potential studies within the systematic map. As is evident, there is a strong bias towards the use of electronic databases. This approach is the most cost-effective means of accessing large quantities of data but, as was clear from the delayed uploading onto ERIC of hundreds of relevant papers, which affected the 2005 study, there is a risk attached to relying heavily upon electronic searching. The 2006 study gave more emphasis to handsearching (see Table 3.1).

Table 3.4: Sources of papers identified in the map (N = 134 studies)

Source	Percentage (%)
Citation	6.15%
Handsearch	5.33%
Electronic databases	88.46%

3.2.2 National contexts (EPPI-Centre keywords)

Often the setting for studies has to be inferred from the names of towns, or parts of a country, or by the University in which the author/researcher works, but despite this, in each year it has been evident that the vast majority of studies have come from the United States. The requirement that studies be

in English will have some bearing on this, as will the use of English language database search strategies, but clearly most research is being done within the USA.

Table 3.5: National contexts (N = 134 studies)

Country	Number of studies
Australia	4
Canada	5
Republic of Ireland	1
New Zealand	1
Norway	1
UK	14
USA	107
Spain	1

In the previous two years (first and second reviews), it was noted that researcher-manipulated evaluations in the US were much more common than any other single study type, and that the vast majority of controlled trials were from the USA. As might be predicted from the proportionately smaller number of studies contributed by the third Review, this profile was continued into the 2006 study.

Table 3.6 Studies of controlled trials by country (N = 134 studies)

Country	Number of studies	Randomised control trial	Controlled trial (non-randomised)
Australia	4	0	0
New Zealand	1	1	0
Norway	1	0	0
UK	14	0	2
Republic of Ireland	1	0	0
Canada	5	1	1
Spain	1	0	1
USA	107	11	28

3.2.3 Study type (EPPI-Centre keywords)

Study type describes the levels of analysis in the studies and the researcher's involvement in the research project. The terms used to define the study types are EPPI-Centre keywords framed by detailed EPPI-Centre definitions.

A 'description' is a study that describes practices, without any attempt to evaluate them or explore variables within them. An 'exploration of relationships' will in some way explore the associations between variables to develop theories and hypotheses. An 'evaluation' assesses whether practices are effective: for example, in relation to educational outcomes. Evaluations can be 'naturally

occurring', in which the researcher does not decide who experiences the practice, or they can be 'researcher-manipulated', in which the researcher in some way changes people's experience and has some control over who experiences what.

When applying these definitions, it is likely that more than one keyword can be applied. For example, many papers will contain a section of description. The dominance, in the review, of evaluation - researcher-manipulated study types is shown in Table 3.7.

Table 3.7 Study type (N = 134 studies)

Study type	Frequency
Description	19
Exploration of relationships	17
Evaluation: naturally occurring	24
Evaluation: researcher-manipulated	78
Review: other review	0

3.2.4 Population focus (EPPI-Centre keywords)

Population focus describes the people the research examines in relation to the study aims. Study participants can therefore be different from the population focus. For example, the 2006 review noted studies which included descriptions of the teachers, but the qualitative and quantitative evaluations were about the pupils. In 2006, over 95% (104 studies out of 109) of studies had a focus upon learners. This is to be expected as criterion 4 excluded studies that did not indicate pupil outcomes and hence in 2006 a similar level was again reached, with 128 out of 134 studies having a focus upon learners. The codes for population focus, shown in Table 3.8 are not mutually exclusive.

Table 3.8 Population focus of studies (N = 134 studies)

Population focus	Frequency
Learners	128
Senior Managers	1
Teaching staff	51
Other education professors	3
LEA officers	2
Parents	4
Non-teaching staff	2

3.2.5 Study focus (EPPI-Centre keywords)

Study focus describes aspects of the educational process that are explored within a study. More than one aspect can serve as a focus, and so over 58% of papers were given more than one keyword.

The most common keyword both on its own and in combination with others was ‘teaching and learning’. Of the studies, 83% had this as their main focus or as an important factor within the research.

Teaching and learning was seen as concerning how people learn and can be encouraged to learn through use of personnel, teaching methods, communication approaches, classroom organisation and so forth. It is distinct from classroom management which focuses upon the management of student behaviour by teachers. Classroom management was the second most common form of study, followed by those with a curriculum focus. In many studies, the curricular area is noted, but this would not necessarily make the subject area a central focus of the research. As in the 2006 review, the most common curriculum focus was literacy, followed by a general curricular focus, then mathematics and science. The 2006 review noted that this trend reflected the current priorities for US and UK policymakers, as well as the nature of the curriculum for primary age pupils.

Table 3.9 Study focus (N = 134 studies; codes are not mutually exclusive.)

Study focus	Number of studies with focus
Teaching and learning	114
Classroom management	43
Curriculum	38
Assessment	4
Other topic focus	20
Organisation and management	14
Equal opportunities	12
Teachers’ careers	4
Policy	3

3.2.6 Context of the studies (EPPI-Centre keywords)

As stated in the previous section, there was a predominance of primary school studies in the review. This situation has remained across the three years of the review. By 2009, 70% of the studies within the map were based in primary schools. This is in contrast to the 29% arising from research in secondary schools.

Previous reviews (Rix et al., 2006) have noted how this large difference is not mirrored, as might be expected, in the age ranges found in the studies. In 2009, 67% of studies include members of the age range 5-10 years and 60% include members of the age range 11-16. However, the ages found in secondary school based studies are curtailed by criterion 5, which excludes studies from the map which were not all or part of the 7-14 age range; commonly identifying the 11-16 year group as present indicates pupils in the upper ranges of the primary school bracket.

As noted by Rix et al. (2006), another factor is the tendency, particularly in US papers, to identify pupils by their grade but not by their age. This was particularly problematic for the Review Group since each grade can span two or three years. Possibly the pupils most likely to be older within a grade will also tend to be those with special educational needs, who are, of course, the focus for this review.

Table 3.10 Frequency of age ranges of studies (N = 134 studies; codes are not mutually exclusive.)

Age range in years	Frequency
0-4	3
5-10	90
11-16	81
17-20	7

The second review raised the point that the vast majority of studies involved pupils of mixed sex and this trend continued into the 2009 map, wherein 77.6% of the studies were mixed. Of single sex studies, boys were more than four times as likely to be the focus as girls, although the numbers of such studies remain small; with 4 and 18 studies working with girls or boys respectively.

3.2.7 Aim of teaching approach (review-specific keywords)

The same pattern was noted in the 2009 map, regarding the aims of the teaching approach, as in the two previous reviews. Over 70% of studies (N=98) aimed to raise the academic attainment of pupils, with 47% (N=63) aiming to enhance social interaction and involvement. Of the studies, 23% (N=32) were intended to improve behaviour. Clearly, a number of studies identified more than one aim for the approach being researched.

3.2.8 Outcome of teaching approach (review-specific keywords)

At the start of this review, single and combined categories for raising academic attainment, enhancing social interaction and improving behaviour were included. As a result, reviewers keyworded studies in both the single and the combined categories. To clarify this, it was necessary to go back to each study and unpack the overlapping keywords. This demonstrated the preponderance of studies that had raised academic attainment, followed by those which had enhanced social interaction. As in the previous two years, papers were noted which aimed to raise academic attainment but did not report doing so, or which aimed to raise attainment but did not report outcomes.

Table 3.11 Outcomes of teaching approaches

Attribute	Raised academic achievement	Enhanced social interaction/ involvement	Improved behaviour
Raised academic achievement	38	28	13
Enhanced social interaction/ involvement	28	27	18
Improved behaviour	13	18	13

Table 3.11 indicates the number of studies reporting particular outcomes: for example, raised academic achievement and improved behaviour were identified in 13 studies. Not shown in the table are mixed positive and negative outcomes which were noted in 21 studies.

3.2.9 Who judges outcomes? (review-specific keywords)

As in the first and second reviews, over 90% (N=122) of research outcomes are primarily judged by the researcher, with the teacher being involved in 38% of papers. Pupils remain a minority category here and are involved in judging outcomes in 19% of studies.

Rix et al. (2006) had hoped that this figure would be higher, particularly when 44% of the 2005 studies claim enhanced social interaction and involvement. However, in 2009, the number of such instances where this was the case remained relatively low.

Table 3.12 Who judges the outcomes? (N=134 studies)

Judge of outcomes	Frequency
Researcher	122
Teacher	50
Pupil	26
Parent	7
Support staff	7
Other	4

3.2.10 Target group (review-specific keywords)

As would be expected the principle target groups for teaching were Pupils with learning disabilities (66.5%, N=89) and all pupils (48%, N=65). This focus, on all pupils, reflects the mainstream settings required for inclusion in the review. Figure 3.13 shows the target groups as percentages of the review sample. These target groups are not mutually inclusive.

Table 3.13 Target group for the teaching approach (N = 134 studies)

Target group	Frequency
Pupils with learning disability	89
All pupils	65
Other	38
Pupils with physical disabilities	15
Pupils with autistic spectrum disorders	13
Pupils with severe learning difficulties	11
Pupils with visual impairments	9
Pupils with hearing impairments	9

3.2.11 Staff involved (review-specific keywords)

Rix et al. (2006) noted the comments of users to members of the Review Group which suggested that many teachers still find themselves working independent of support for a large part of any working day. This aspect was of particular importance to the 2006 review and hence that review identified the staff involvement within the studies. Updating this aspect of the review in 2009 continues to highlight the frequency of the mainstream classroom teacher in working with children with special educational needs. For the third year of the review, this aspect remains significant.

Table 3.14 Who does the teaching? (N=134 studies, codes are not mutually exclusive)

Teacher group	Frequency
Regular mainstream teacher	78
Teachers with equal roles in collaboration	4
Special teacher and regular teacher in collaboration	37
Learning support assistants	11
Peers	32
Others	32
Teachers in collaboration (other)	20

3.2.12 Nature of the teaching approach (review-specific keywords)

The studies were keyworded according to the nature of the teaching approach studied. The most common approach taken within the studies was Adaptation of instruction (58%), Peer Group Interactive (44%), which formed the focus for the 2004 in-depth review, and then Adaptation of materials (42%).

Table 3.15 Nature of the teaching approach (N = 134 studies)

Teaching approach	Frequency
Adaptation of instruction	78
Adaptation of material	42
Adaptation of assessment	17
Adaptation of classroom environment	23
Behavioural/programmatic intervention	23
Teaching approach	
Computer- based	7
Peer tutoring	22
Peer group interactive	44
Team teaching	26
Other	21

3.2.13 Staff involved in delivering particular teaching approaches

A range of teaching approaches are identified within the map (3.2.12) and teachers are seen to be working both independently and in collaboration within these studies (3.2.11). This raises the question as to whether particular teaching approaches are delivered by teachers alone or in collaboration. No significant patterns of interaction emerge between teaching approach and method of delivery (collaborative or not), which might suggest that factors outside of available classroom personnel are influencing the choice of method.

3.2.13 Form of interaction (review-specific keywords)

There was evidence of a variety of interaction forms, occurring within single studies. Indeed, the 134 studies were keyworded 340 times.

As might be predicted from experience of mainstream class practice verbal and written interactions were the most common, and clearly so (see Figure 3.16). This suggests that the primacy of traditional talking and writing interactions remain relatively unaffected in settings where a diversity of learners are being taught.

The comparative failure to include, for example, more pictorial, hands on activities or signing within these studies highlights a major challenge for researchers and teachers, as both of these methods are cited in the 2004 review as integral to the support of pupils who experience difficulties in learning, in non-mainstream settings. (This issue is discussed further in Chapter 4).

Table 3.16 Forms of interaction evidenced (N = 134 studies; codes are not mutually exclusive)

Interaction	Frequency
Verbal	111
Auditory	31
Visual	21
Pictorial	23
Signed	2
Written	70
Tactile	16
Technological	22
Other	35

3.2.14 Participants in the interaction (review-specific keywords)

Predictably, the majority of the studies gave evidence of pupil-teacher interactions (77%) and pupil-pupil interactions (59%), but far less attention was paid to the interactions involving pupils, teachers and support staff (21%), pupils and support staff (19%), and between staff (18%). This relative lack of focus on support staff occurs despite over 60% of studies involving additional practitioners in the classroom. Previous reviews have noted this lack of engagement with the interactions involving those practitioners and concluded that this makes it far harder to assess the impact of those practitioners on the success of the studies and the teaching approaches they examine. It could also be that these practitioners, while in the majority of the classrooms are less involved in explicit pedagogical interactions.

Table 3.17 Participants in interactions (N = 134 studies; codes are not mutually exclusive.)

Participants	Frequency
Pupil-teacher	103
Pupil-pupil	79
Pupil-support staff	28
Pupil-teacher-support staff	26
Teacher-support staff	13
Teacher-teacher	10
Other	26

3.2.15 Type of interaction (review-specific keywords)

The most commonly identified interactions were considered (69%) and informal (62%), both of which were about three times more common than the programmed interactions (21%). These categories were not mutually exclusive, of course, and so the 134 studies were keyworded 204 times.

Table 3.18 Types of interactions (N = 134 studies; codes are not mutually exclusive.)

Interaction type	Frequency
Programmed	21
Informal	62
Considered	69

3.3 Identifying and describing studies: quality-assurance results

3.3.1 Monitoring the validity of the review's focus

As indicated in section 2.1, the Advisory Group provided a sounding board for key matters of discussion. Their comments suggested that the in-depth review question was of interest and potential benefit to the intended audience.

As stated in section 2.2.3, this review used the systematic review procedures as described in the EPPI-Centre documentation to ensure that the review was systematic within the resources available.

3.3.2 Screening

Screening of both titles and abstracts and full text documents was conducted by two independent screeners. A random sample from the 2009 sample was screened by the EPPI-Centre link person. This consisted of 13 titles and abstracts in addition to eight full articles. Uncertainties concerning the inclusion of individual reports were shared and resolved.

120 papers were examined by two reviewers for the 2009 review. Initially, a sample of nine papers was assessed by a third reviewer, from the EPPI-Centre team. Independently reached decisions were in agreement on eight of the papers and the outstanding paper was agreed following discussion.

The two reviewers subsequently met to moderate their decisions, coming to agreement over papers which they had rated differently.

3.3.3 Keywording

As quality assurance, two studies were keyworded in 2004 by all members of the Review Group (N=5), allowing for deliberation over the process and clarification of the guidance and protocol. In 2006, all members of the Review Group met to evaluate the keywording process of the previous year and to clarify the process for the subsequent review. For 2009, the Group followed the same process of evaluating the previous year's keywording process as a preparation for that year's subsequent keywording activity.

Each study was then keyworded by two members of the Review Group working first independently and then comparing their decisions before coming to a consensus. Seven members of the team conducted this process, using a staggered pair method. In the first year, less experienced members of the Review Group were paired with experienced or trained keyworders/reviewers. In year 3, all members of the Group had acquired experience of keywording. A random sample of eight studies was keyworded independently by the EPPI-Centre link person. This sample was also keyworded independently by two members of the Group. Decisions were shared and discussed between the three keyworders.

3.4 Summary of results of map

170 abstracts and titles were initially screened for the 2009 review and 86 failed to meet the inclusion criteria. The full articles were requested for those that met the inclusion criteria, or where more information was needed. These articles were combined with an additional 44 papers which were not obtained in the 2004 and 2006 review years. The 120 papers which formed this combined group (eight were not obtained) were assessed. Consequently, 25 studies were added to the systematic map, giving a total of 134 studies: 68 studies from 2004, 41 studies from 2006 and 25 studies from 2009.

These 134 studies were assessed and consequently 11 studies met the criteria to pass into the in-depth review.

CHAPTER FOUR

In-depth review: results

This chapter provides further information of the studies included in the in-depth review. The studies are categorised and narrative descriptions of each of the studies are presented. The chapter synthesises the evidence and both the first and this section constitute the bulk of the chapter. The process of assuring the quality of results is also described, as well as the actual involvement of users in the review.

4.1 Selecting studies for the in-depth review

It was important to select from the map of 134 studies those studies for in-depth review that were of the most direct relevance to teachers in training and newly qualified teachers as well as training providers. Discussion took place between members of the Review Group and members of the external groups about which cluster of studies could provide evidence of strategies that all teachers could use in mainstream classrooms to include pupils with special educational needs. In teasing apart the knowledge that was desired, this discussion culminated in a consensus that the Review Group should seek instances in which the teacher began from a consideration of making the subject being taught accessible to a diverse range of learners within their classroom.

A central part within this search, as indicated in section 3.3, should be seeking research that evaluated and held descriptions of ‘pedagogy in practice’. This was seen as a vital factor in feedback from both the review’s expert advisors and the review’s intended audience.

Thus, the question for the in-depth review became the following:

What is the nature of whole class, subject-specific pedagogies, which has reported outcomes for the academic and/or social inclusion of children with special educational needs?

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 would include those studies that meet all the following criteria:

- Learning aims were set for the whole class.
- Learning tasks were subject-specific.
- Pedagogy in practice (i.e. teaching practice) is stated and described.

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

- Learning aims were not set for the whole class but may be set for individual children.
- Learning tasks were not subject-specific.
- No pedagogy in practice (i.e. teaching practice) was stated or described.

The review-specific keywording has already asked ‘Who does the teaching’ and so the selection of research in which the classroom teacher carried out the teaching was already identified.

The following 11 articles satisfied the criteria for inclusion in the in-depth review.

- Ferretti RP, MacArthur CD, Okolo CM (2001). Teaching for historical understanding in inclusive classrooms. *Learning Disability Quarterly* 24: 59-71.

- 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.
- Lederer JM (2000) Reciprocal teaching of social studies in inclusive elementary classrooms. *Journal of Learning Disabilities* 33: 91-106.
- Mastropieri MA (2000) Putting mnemonic strategies to work in an inclusive classroom. *Learning Disabilities Research and Practice* 15: 69-74.
- Miller SP, Harris CA, Strawser S, Jones WP, Mercer CD (1998) Teaching multiplication to second graders in inclusive settings. *Focus on Learning Problems in Mathematics* 20: 50-70.
- Morocco CC, Hindin A, Mata-Aguilar C, Clark-Chiarelli N (2001) Building a deep understanding of literature with middle-grade students with learning disabilities. *Learning Disability Quarterly* 24: 47-58.
- Okolo CM, Ferretti RP (1996) The impact of multimedia design projects on the knowledge, attitudes, and collaboration of students in inclusive classrooms. *Journal of Computing in Childhood Education* 7: 223-251.
- Palincsar AS, Magnusson KMC, Collins, KM, Cutter J (2001) Making science accessible to all: results of a design experiment in inclusive classrooms. *Learning Disability Quarterly* 24: 15-32.
- Rieth HJ, Bryant DP, Kinzer CH, Colburn LK, Hur S, Hartman P, Choi HS (2003) An analysis of the impact of anchored instruction on teaching and learning activities in two ninth-grade language arts classes. *Remedial and Special Education* 24: 173-184.
- Sideridis GD, Utley CA, Greenwood CR, Dawson H, Delquari J, Palmer P (1998) An intervention strategy to enhance spelling performance and social interaction and to decrease inappropriate behaviours of students with mild disabilities and typical peers in an inclusive instructional setting. *Research in Education* 59: 109.
- Stevens RJ, Slavin RE (1995a) Effects of a cooperative learning approach in reading and writing on academically handicapped and nonhandicapped students. *Elementary School Journal* 95: 241-262.

4.2 Comparing the studies selected for in-depth review with the total studies in systematic map

4.2.1 Topic of research

Given the question being addressed in the in-depth question, it is not surprising that the topic of research which unites all the studies in the in-depth review is 'teaching and learning.' Table 4.1 shows the other foci of the identified studies.

Table 4.1 Research topic of the studies in the in-depth review (N = 11)

Research topic What is/are the topic focus/foci of the study?	Number	Studies (identified by author)
Teaching and learning	11	Ferretti et al. (2001) Goatley (1996) Lederer (2000) Mastropieri (2000) Miller et al. (1998) Morocco et al. (2001) Okolo and Ferretti (1996) Palincsar et al. (2001) Rieth et al. (2003) Sideridis (1998) Stevens (1995)
Curriculum	7	Ferretti et al. (2001) Goatley (1996) Lederer (2000) Morocco et al. (2001) Okolo and Ferretti (1996) Palincsaret al. (2001) Sideridis (1998)
Organisation and management	2	Morocco et al. (2001) Sideridis (1998)

These studies, which are identified, reflect different interacting context levels. These are discussed throughout this section.

4.2.2 National context

In the descriptive map, the majority of the studies described research which had been carried out in the United States of America and in the in-depth review all the selected studies were conducted there.

Table 4.2 National context of studies in the in-depth review (N = 11)

National context	Number	Studies (identified by author)
United States of America	11	Ferretti et al. (2001) Goatley (1996) Lederer (2000) Mastropieri (2000) Miller et al. (1998) Morocco et al. (2001) Okolo and Ferretti (1996) Palincsaret al. (2001) Rieth et al. (2003) Sideridis (1998) Stevens (1995)

4.2.3 Educational context

Of the studies in the in-depth review, nine were classified as occurring in primary schools, with the remaining two studies being situated in secondary schools. These classifications are ‘Anglo-centric’ and reflect the ages grouping of pupils within the United Kingdom’s school system where a division between the two schools typically occurs at 11 years of age. Thus the categories reflect the age ranges of the learners and do not use descriptors such as ‘elementary school’ or ‘middle school’. This classification matches those of the previous two reviews contributing to the descriptive map. In the overall descriptive map, the majority of the studies are also categorised as being in a ‘primary school’ context.

Table 4.3 Educational context of studies in the in-depth review (N = 11)

Educational context	Number	Studies (identified by author)
Primary school	9	Ferretti et al. (2001) Goatley (1996) Lederer (2000) Mastropieri (2000) Miller et al. (1998) Okolo and Ferretti (1996) Palincsaret al. (2001) Sideridis (1998) Stevens (1995)
Secondary School	2	Morocco et al. (2001) Rieth et al. (2003)

4.2.4 Curriculum area

Five of the identified studies focused on an aspect of the English (as a first language) curriculum as shown in Table 4.4. This is in keeping with the curricular profile in the descriptive map which had a preponderance of studies on literacy (or language arts or literature or English).

Table 4.4 Curriculum area of studies in the in-depth review (N = 11)

Curriculum area	Number	Studies (identified by author)
History	2	Ferretti et al. (2001) Okolo and Ferretti (1996)
Literacy - first language	5	Goatley (1996) Morocco et al. (2001) Rieth et al. (2003) Sideridis (1998) Stevens (1995)
Other curriculum: social studies	2	Lederer (2000) Mastropieri (2000)
Mathematics	1	Miller et al. (1998)
Science	1	Palincsaret al. (2001)

4.2.5 Research design

The research designs employed in the studies in the in-depth review are, in the majority, researcher-manipulated. This is shown in Table 4.5. This group includes three articles describing controlled, but non-randomised trials: Stevens (1995a), Lederer (2000) and Ferretti et al. (2001). There are no randomised trials in the in-depth studies. This reflects the lack of randomised trails in the descriptive map. The remaining studies are evaluations, with Lederer (2000) also including an exploration of relationships.

Table 4.5 Research design of the in-depth review studies

Research design	Number	Studies (identified by author)
Evaluation: researcher-manipulated	8	Ferretti et al. (2001) Miller et al. (1998) Morocco et al. (1996) Palincsaret al. (2001) Rieth et al. (2003) Sideridis (1998) Stevens (1995)
Evaluation: naturally occurring	3	Goatley (1996) Lederer (2000) Mastropieri (2000)
Exploration of relationships	1	Lederer (2000)

4.2.6 Student outcome measures

Across the 11 studies, a range of outcome measures was used. The nature of these measures is indicated in Table 4.6. This summarises the main types of student outcome data in each study. There is variation in the degree to which these outcomes is operationalised. This is discussed in section 4.3.

Table 4.6 Student outcomes foci for studies in in-depth review (N = 11)

Ferretti et al. (2001)	Changes in academic attainment Changes in behaviour Changes in attitude Changes in self-efficacy
Goatley (1996)	Changes in academic attainment Changes in behaviour Changes in social interaction
Lederer (2000)	Changes in academic attainment
Mastropieri (2000)	Changes in academic attainment Changes in behaviour
Miller et al. (1998)	Changes in academic attainment
Morocco et al. (2001)	Changes in academic attainment
Okolo and Ferretti (1996)	Changes in academic attainment Changes in behaviour Changes in attitudes Changes in self-efficacy
Palincsar et al. (2001)	Raised academic attainment
Rieth et al. (2003)	Raised academic attainment and enhanced social interaction/involvement
Sideridis (1998)	Changes in academic attainment Changes in behaviour Changes in social interaction
Stevens (1995)	Changes in academic attainment Changes in social interaction

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

This section offers further details of the studies included in the in-depth review. As established in the preceding two ‘special Educational needs’ reviews (Nind et al., 2004; Rix et al., 2006), it does this by presenting a narrative outline of each study with reference to conceptual focus and context, research design, and key findings and/or conclusions. Following this narrative account of individual studies, key elements of the studies are presented in tables 4.7 to 4.9 to give a thematic overview. This is followed by a discussion of the reviewers’ final ratings of the trustworthiness of the researchers’ approach and conclusions. Consideration is then given to the weight of evidence which has been allocated to the study. The subsequent section draws upon these evaluations to develop a synthesis of the evidence from the studies.

4.3.1 Ferretti et al. (2001) Teaching for historical understanding in inclusive classrooms

The context for this study is four fifth-grade classrooms located in two different urban intermediate (Grade 4 through to Grade 6) schools in Delaware. However, one of the classrooms was dropped from the sample due to continual difficulties with classroom management. These difficulties were thought to be related to an increase in the student population and prolonged absence of a special educator due to family bereavement.

The study employs a model called the ‘Team Approach to Mastery’ (TAM; Bear and Procter, 1990) in which students with mild learning disabilities (LD) and without disabilities are taught together by both general and special educators with part-time assistance from a paraprofessional. The typical ration of students with and without disabilities is three to one. Fifty-nine students without disabilities and twenty-eight with disabilities participated in this study. Delaware’s definition of LD is based on a discrepancy between ability and academic achievement. However, not all the students met the accepted criteria for identification as LD. Of the 28 students, eight had IQ scores below 80 and only twelve met the dual criteria of IQ over 85 and a discrepancy of one standard deviation between IQ and achievement.

The work focused on the implementation and evaluation of a unit based on a curriculum model, ‘strategy-supported project-based learning’ (SSPBL), which was designed to help learners with and without mild disabilities to learn historical context and to understand the processes of historical thinking. The unit, which focused on the westward expansion that took place in the United States in the 19th century, was designed to be consistent with the researchers’ conception

of authentic tasks. The unit was designed to help students understand selected concepts about the westward expansion and to understand rudimentary ideas about the processes used by historians to analyse and interpret historical evidence.

The data consisted of the following:

- A group knowledge test administered to all participating students pre- and post the unit.
- An attitudinal scale was administered to all participating students - The scale contained three factors: self-efficacy for learning social studies in general and westward expansion in particular; intrinsic motivation for social studies; and students' attitudes to cooperative learning and toward collaborating with peers.
- Individual interviews on historical content and historical inquiry were administered before and after instruction to 18 students with disabilities and to a sample of 27 students without disabilities who were selected to match the students with disabilities on race and gender.
- Observation and field notes: Each classroom was observed approximately once a week and field notes were used to get a better sense of how the unit was implemented in each classroom and its impact on students.

The curriculum-based nature of the studies' 'academic' tests suggests strong validity for those items. The tools used in collecting group knowledge and attitude have been considered in terms of reliability.

The use of repeated-measures ANOVA in the quantitative data analysis appears sensible, but the rationale (that the data is suitable for parametric analysis) is not explicitly discussed. The statistical analysis provides a probability estimate for significant differences in changes in pre and post test scores on five measures.

The study presents evidence that the use of the SSPBL unit is associated with gains across several specified measures of subject knowledge. Students with and without learning disabilities showed gains in subject knowledge, but a larger gain was made by the former group. Both groups showed gains in self-efficacy as learners. In considering these conclusions, the reviewers noted some potentially confounding variables which could have been considered further. The same tests are used as pre and post measures. It would therefore be useful to have a 'control' group for comparison. This would also help consider the influences of changes outside the classroom. The study compares the performance of two groups across three classroom settings and their teacher/classroom influence could be considered. However, in its own terms of comparing the responses of children within a class to a pedagogic approach, the study is robust. The

reviewers agreed that the study was ethical in its approach.

The reviewers judged that the weight of evidence against the question was high in that the study shows an approach that can be used in an inclusive classroom and produce gains for all pupils in a specific curriculum area.

The study was considered to have high relevance to the in-depth research question. The conceptual focus of the study - the degree to which implementation of the strategy supported project based learning (SSPBL) promotes improvement in students knowledge of part of US history curriculum, understanding of content and inquiry - is highly pertinent to the in-depth question. Similarly, the effects of such a programme on learners self efficacy and the identification of teachers' barriers in implementing the programme are highly relevant to the research question. The reviewers agreed that the study shows how a specific teaching approach works for both pupils with and without disabilities, but with the proviso that it does not explicitly consider the extent to which these changes are the results of the programme itself or influenced by other factors, such as curriculum testing preceding a period of instruction, or no instruction.

4.3.2 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 is a Grade 5 classroom in a neighbourhood elementary school in the USA. The work focused on a literature-based reading programme with four components: reading, writing, instruction and large group discussion. This is a single case study of the progress in literacy acquisition and comprehension of text, and, in acquisition of social skills of one 'learning-disabled' male student, Stark, in a mainstream classroom. It aimed to examine Stark's progress, most particularly through participation in a book club group in the mainstream classroom. The main types of data collected were as follows:

- fieldnotes in classroom, two days per week for two terms
- videotapes of physical movements, facial expressions and non-verbal behaviour
- 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, and data discussed with the student. The reviewers noted that no details were given regarding how the ethical issues of consent and assent were dealt with or obtained within the paper.

The author notes gains in literacy and oracy for the single student, increased on-task behaviour and enhanced social interactions. The author concludes that students who experience difficulties in learning benefit from literacy activities which encourage multiple responses (drawing on the text, their own experiences and the viewpoints of peers) through social interactions in the class. She also highlights the role of support teachers in facilitating the learning of students with learning difficulties in a mainstream classroom.

The reviewers judged that the weight of evidence against the question was 'medium-high' because the case study design enables a rich description of the whole class pedagogy in the literacy curriculum-specific book club. It is a study of the implementation of a whole classroom approach in with the outcomes discussed for one student. There is discussion of how the groupings were organised in order to include all pupils. The reading, writing and oral interaction elements of the pedagogy are described along with analysis of the fieldwork, observation, interview and documentary data. The design allows the reader insights into the actions of the case study student, his teacher and his peers. The year-long nature of the study provides longitudinal insights into processes and outcomes.

The study was considered to have medium to high relevance to the in-depth research question. The conceptual focus of the study - participation in mainstream classroom pedagogy in a literacy programme and the teacher's instructional supports - are highly pertinent to the in-depth question. Curriculum-based measures, such as the reading log, self-evaluation and classwork, are very relevant to understanding inclusive pedagogy in practice. However, there are some limitations associated with single case studies in terms of generalising their findings to other classrooms and educational settings.

4.3.3 Lederer (2000) Reciprocal teaching of social studies in inclusive elementary classrooms

This research was carried out in a district of New Mexico that had adopted the practice of inclusion as a means to educate students with mild to moderate disabilities. At each grade level in the rural public elementary school in which it was conducted, there were two inclusive classrooms and two non-inclusive classrooms, and the two inclusive classrooms became the focus of the study.

The work took place over a three-month period during which the researcher provided an intervention to selected classes of pupils (experimental groups) in three grade levels, taking over the classrooms of the regular teachers for social science classes. Adopting a particular approach to teaching, 'reciprocal teaching' (RT), the researcher taught the class the same material that they would have had anyway had they stayed with their regular teacher and tested them on specific skills (such as generating summaries and questions - that is, their ability to interrogate, interact and comprehend fairly unfamiliar text) and also tested them using the same tests (end of section in textbook tests) they would use with their regular teacher. Control groups were set up as comparator groups to enable effectiveness of the method to be assessed; the comparable children in these groups remained with their regular teachers for their social studies work and their attainment was compared against the experimental pupils.

On the grounds that RT had been found in previous research to be an effective means of developing comprehension with students with learning disabilities, the researcher sought to investigate its effectiveness in a specific curricular area. In particular, he sought to establish how interaction in terms of questions and answers, and summarising statements, from pupils would improve in a RT environment. Moreover, he sought to compare the effectiveness of RT as an approach to enhancing pupils' ability to generate questions and short summaries about text, with more traditional, teacher-controlled methods.

There are two research hypotheses:

1. Students in the experimental classrooms would significantly improve their ability to answer short questions based on unfamiliar passages of social studies text, generate questions about the text, and compose a short summary of the text when taught with the method of RT, compared with control children taught by traditional means.
2. Students with learning disabilities in the fourth, fifth and sixth grades would significantly improve their ability to answer questions, generate questions, and compose summaries as a result of RT compared with students taught by traditional teacher-directed methods.

The concept or variables examined include student skills (especially students with learning difficulties) in interacting meaningfully with social studies text: specifically, their skills in generating questions on unfamiliar passages of social studies text, their skills in answering questions, and their skills in composing short summaries of text.

Consequently, the data gathered comprised the following:

- Pre- and post-test yielding

- reading comprehension measures
- question generation measures
- answering questions measures

In addition, summary composition measures were used and 20% of these were independently rated by two independent raters with an ultimate agreement of 94.55%.

It is inferred that the perceptions of teachers were collected, although the detail of how this was achieved is unclear.

There were some attempts to address issues of validity; however, the teacher factor and the issue of his particular enthusiasm for the approach was not acknowledged or discussed. The reliability of the research measures was addressed in the sense that independent raters were involved in the scoring of the assessment data once it had been collected. The reviewers raised some issues with regard to generalisability. No claims are made in the paper about statistical representation and the author is careful to point out that, as a consequence of the lack of random allocation of the intervention to groups, the results observed 'may not necessarily be generalisable to other populations' (p 101).

Nevertheless, the discussion and the conclusion indicate that the findings are assumed to be applicable to all pupils and particularly to pupils with learning disabilities in mainstream settings.

The reviewers judged that the weight of evidence against the question was 'medium-high'. The study was also considered to have medium to high relevance to the in-depth research question. The conceptual focus of the study - the effectiveness of reciprocal teaching during social studies instruction with several students with learning disabilities in inclusive classrooms - would appear to be highly relevant.

4.3.4 Mastropieri (2000) Putting mnemonic strategies to work in an inclusive classroom

This article describes one teacher's application of mnemonic strategy instruction in her inclusive, fourth grade social studies class. The paper implies that the teacher-researcher, learned about mnemonics during a course run by the two other authors. The teacher-researcher then applied the techniques she had learned and presumably consulted with them in running and publishing this research.

The class consisted of 26 students, of whom five were reported to have special education needs. Four of the students with SEN had specific learning disabilities and speech and language impairments, while one student also had emotional disturbances. The fifth student was being assessed for 'special

education'. In addition, a high student turnover in the class is noted. Whether this affected the study, or not, is not mentioned.

The objective of the study was to assess the effectiveness of a mnemonics strategy for social studies curriculum material, in an inclusive classroom. In this strategy, new vocabulary is learned by associating it with a keyword which is linked to the new vocabulary words meaning. This association is visualised or displayed as a picture. The example given is Posset-possum (image of possum drinking a milky drink). The teacher/ researcher introduced this approach and compared the performance of different groups of children. She also compared the recall of material taught using mnemonics and taught without using mnemonics. However, no baseline measures appear to have been made, nor is it clear when the non-mnemonic data was collected.

The data collected included the following:

- test results on the recall of curriculum materials (academic achievement)
- self-completion questionnaire data (attitudes to using mnemonics)

Thus the class group was assessed on their recall for specific curriculum content items. Recall scores were compared for students with and without special needs, made for material taught with/ without mnemonics. The authors note much greater improvements in recall for 'students enrolled in special education' in comparison with the more modest improvements for the other students. However, it is not clear if the latter comparison controlled for confounding variables: for example, the relative difficulty of material (in terms of recall) or order effects. The author, in commenting on the classroom research, concludes that mnemonic strategy instruction can be an important element in of inclusive classroom settings (p 72). The second and third authors follow this account of classroom research with a 'research perspective' on mnemonic instruction, which review previous research in the area.

The research perspective part of the paper argues that mnemonic strategies can be used effectively for pupils with special needs in inclusive classrooms. The reviewers agreed that this suggest that an established technique appears to have produced comparable, and predictable, results in a single classroom. In this sense, the results are generalisable. There is an existing body of empirical evidence showing that children's recall is improved via the use of a mnemonic strategy. The reviewers commented that validity of the classroom research part of the paper seems reasonable within an Action Research model.

The reviewers judged that the weight of evidence against the question was 'medium to low'. The

study was considered to have high relevance to the in-depth research question. The study looks at a pedagogical approach in a specific curriculum area. It is used with all class members, including pupils with special educational needs. The theoretical and research background for the pedagogy is strong. The 'research perspective' gives evidence that mnemonics are potentially an effective pedagogical approach, for the recall of curriculum specific materials. However, the results for the original research undertaken, by the teacher-researcher within a single classroom, could be given alternative explanations. Further, some of the research conclusions are not supported with evidence arising directly from the classroom research. These factors reduce the weight awarded to the paper.

4.3.5 Miller et al. (1998) Teaching multiplication to second graders in inclusive settings

It is implied that this research took place in the USA. Moreover, the regional context in which this research took place is not described beyond that of the sample group characteristics and phase of education. The study involved six general classroom teachers and their Grade 2 pupils. All 123 pupils in 6 classes are in the sample, but the focus is the 13 SEN and 11 low achieving pupils.

The researchers claim that this 'research is needed to determine whether students with learning difficulties need differentiated, small-group instruction' or whether research-based mathematics methods can be used successfully in inclusive classrooms containing 25-27 pupils (p 53). Moreover, 'with the exception of classwide peer tutoring, researchers have neglected to study math interventions for inclusive general education classes' (p 52).

This study reports on the findings obtained from teaching initial multiplication concepts, skills and principles to students with disabilities, low-achieving students, and students who were achieving normally in inclusive, general-education settings. The study attempts to ascertain whether the teaching of a series of tightly structured mathematics lessons will result in successful learning for SEN and low achieving pupils.

An additional implied aim was to determine whether a specific multiplication programme would enable SEN and low achieving students to learn multiplication successfully in inclusive classrooms.

At the beginning of the study, the six general classroom teachers were given a one-day training to teach basic multiplication skills, concepts and principles. They were also provided with the manual, full teaching and assessment materials and 'access to experts' - the researchers. The teachers taught a series of 21 multiplication lessons to their second grade classes, following the tightly

structured sequence and teaching procedures laid out in the manual. Pre- and post-tests of all pupils' knowledge of multiplication facts were administered. Pupils' correct responses at each stage of the unit (concrete, representational, abstract, word problems) were also analysed. Data was analysed by repeated measures (MANOVA) for both research questions. All the teachers and pupils were surveyed afterwards for their evaluation of the programme.

The researchers' first research question asked whether 'there was significant difference in the responses on the dependent variables' between SEN pupils and low achieving pupils. The second question, which was contingent on the results of the first, asked 'whether there was significant difference in responses on the dependent variable between students identified as normal achievers and students in the other groups' (p 61).

Researchers identified and measured the following six dependent variables in the study:

- an untimed pre- and post-test
- a timed pre- and post-test
- number of correct responses on each of a series of three 10-item concrete lessons
- number of correct responses on each of a series of three 10-item representational lessons
- number of correct responses on each of a series of three 10-item abstract lessons
- number of correct responses on each of a series of three 10-item word-problem lessons

The reviewers comment that the study employs standard statistical procedures for analysis of the data, including statistical tests (e.g. analysis of variance, such as MANOVA). The study gives a justification for these parametric analytical procedures and decisions, and considers issues of validity/reliability in the choice of procedures adopted. The study gives a justification for these analytical procedures and decisions, and considers issues of validity/reliability in the choice of procedures adopted. In doing so, it includes a discussion of appropriate actions and procedures, and also limitations posed by the complexities of the data. In addition, aspects of the mathematics programme (particularly pupil motivation and enthusiasm) are ignored in the analysis.

There is no detail of ethical procedures contained within this account. However, consent from parents is implied as it notes that the data for 32 students data (on the multiplication instruction) was not included as their parents did not grant permission for it to be included in the study.

The researchers report findings for each of the six dependent variables. Each dependent variable is analysed (a) for a difference between disabled and 'low achiever' groups, and (b) for a difference between the 'normal group' and the combined disability/low achiever group. The analysis is clearly presented in a single table format (Table 1, p 63).

The paper reports that no differences were found on any measure between the 'disability' and 'low achiever' groups. Differences were found on two measures out of five for the combined group compared with the 'normal achiever' group. These differences might be expected for example that students who have identified learning disabilities or a history of poor achievement fared worse on the tests of 'abstract lessons' and in a measure of 'overall achievement'. The researchers, and the reviewers, noted the importance that, for all students, there was a marked increase in pre- to post-test measures and that, on five of the measures, performance was comparable.

It is on this basis that the researchers conclude that diverse groups of students can be successfully taught in an inclusive classroom. The reviewers noted the critical analysis applied by the researchers to their study, in highlighting critical variables which may have had a positive influence on the results. These, the reviewers felt, could be summarised as applying an empirically proven teaching approach, teacher training in the approach itself and provision of appropriate support materials. Of particular relevance to the in-depth question is the researchers' conclusion, based on their findings, that the same teaching approach works well across the diverse groups of learners. Although teacher and student satisfaction was reported as high, the details of this assessment tool is lacking. The reviewers judged that the weight of evidence against answering the study questions was medium. The study was considered to have high relevance to the in-depth research question.

4.3.6 Morocco et al. (2001) Building a deep understanding of literature with middle-grade students with learning disabilities

Focusing on supporting the literacy development of students with learning disabilities, this study examines the implementation of a supported literacy approach within a mainstream middle school (US) context, involving normally achieving pupils, those with an identified learning disability and those considered as honours students. It provides a comparative, cross-sectional evaluation of the intervention and its benefits for the identified range of pupils. The study reports on the numbers initially involved (278), including 120 from inclusion classrooms, 139 normally achieving, and 80 from honours classrooms. Those actually included in the analysis (as a matter of data quality) numbered 163 pupils included: 35 with disabilities; 76 normally achieving; and 52 honours students.

Eleven middle-school teachers elected to join the supported literacy programme. They received training in programme teaching methods, then implemented the programme in 'inclusion', 'normally achieving' and 'honors' classes (15 classes in total). The data was collected during the teaching of the third unit of the programme. The teachers completed self-reports of their implementation of the programme cycle. The researchers also 'conducted two observations in each of the inclusion classrooms to verify teachers' self-reports', and collected student journals to assess implementation.

The aim of the study was to discover 'whether students' persuasive writing in a supported context, where they work closely with teachers and peers, is stronger than their writing in an independent context' (p 49). Specifically, it focuses on the understanding of literacy concepts, and understanding how to read and compose text with varied purposes.

The researchers identify a series of four research questions:

1. How extensively are teachers implementing the Supported Literacy approach?
2. How did students with disabilities perform on understanding tasks in a supported literacy context? How did their performance in that context compare with that of normally achieving students and honours students?
3. How did students with disabilities perform in an independent literacy context? How did their performance in the independent literacy context compare with that of normally achieving students and honours students?
4. How did the performance of students with disabilities perform in supported context compare with their performance in the independent literacy context?

At the end of the unit, students' work was examined, in both the supported literacy context and the independent literacy context. Researchers measured writing fluency and writing quality of all students. They then analysed the findings, comparing student outcomes in the two literacy contexts (supported and independent), and comparing the achievement of the three groups of students.

Data gathered included the following:

- teachers' self-completion reports of programme elements actually used
- observations to 'verify teachers' self-reports about the extent to which they were implementing the full literacy cycle' (two observations in each of the five inclusion classrooms)
- student journals

In terms of pupils' performance outcomes, student work was analysed in both the supported and independent literacy contexts, in terms of writing fluency and writing quality in both contexts. Data collected for this was as follows:

- student journal entries
- 'MCAS-like assessment' part 2
- open-ended persuasive writing based on a text excerpt

The paper gives descriptions of the data-collection procedures and analysis (including statistical tests) but contains relatively little by way of explanation or justification of how the procedures were reached, their appropriateness and the degree to which they address issues of reliability and validity. The researchers note that classroom observations were carried out to verify teachers' self-reports about the extent to which they were implementing the full literacy cycle. Further student writing samples were marked independently by two assessors and then shared before reaching a consensus.

The reviewers noted no concerns with ethical aspects of the study as the programme was taught by teachers who elected to partake; the initiative was fully supported by the school head teacher and the district; the programme was established as part of the curriculum for all pupils; and, as far as pupils were concerned, only their written work was collected and analysed. In this context, the fact that the authors do not address student recruitment is not significant. However, the question was raised by the reviewers regarding consent for the use of pupil data for research purposes, which is not addressed.

The researchers' findings compare writing fluency scores results across the three groups of pupils, in supported and independent contexts. In all contexts and measures, the scores are highest for the honours students and lowest for the SEN students, with the 'normally achieving' students obtaining scores between the two; although not a significant difference, this was a strong trend. The reviewers note a lack of reporting of the classroom observations in the paper's findings and discussion.

The researchers conclude that teachers were implementing the supported literacy cycle for SEN students and this gave them a full range of opportunities to 'build a complex understanding of a text', although, they noted, that the SEN students 'did not have access to frequent, independent peer discussions' (p 56).

The reviewers considered this to be an interesting point. The honors students performed significantly better in independent contexts, whereas the students with SEN performed significantly worse in such situations. This latter group was reported as having less access to independent discussions, which might act as a confounding variable here. Overall,

the reviewers saw the researchers' conclusions as highly trustworthy and that the study offers high weight of evidence for the review question. However, they also note that the analytical approach adopted for the classroom observation is not described in this paper.

4.3.7 Okolo et al. (1996) The impact of multimedia design projects on the knowledge, attitudes, and collaboration of students in inclusive classrooms

This study compared the effects of multimedia design projects (MDPs) on the knowledge and attitudes of 65 4th graders (average age 10.2 years) with and without learning disabilities (LDs) in inclusive classrooms (ICRs), and ascertained the appropriateness of MDPs for a diverse student population. 21 students with LDs were observed as they worked cooperatively with 44 classmates without LDs to develop MDPs about the advantages or disadvantages of industrialisation. Assessments of students' knowledge and attitudes, including opinions of MDPs before and after instruction, showed that students' knowledge and attitudes toward cooperative learning generally improved due to collaborative MDP construction, and these changes were comparable for students with and without LDs.

The aims of the study were as follows:

- to determine the effects of a project-based intervention on the knowledge and attitudes of students with and without learning disabilities
- to examine and compare the nature of interactions, of students with/without learning disabilities, in cooperative learning groups

The context of the study is students working in cooperative project groups, using multimedia materials. The effects of this intervention are compared for students with and without disabilities. The study looks at several variables: performance on a knowledge test; responses to questions on self-efficacy; intrinsic motivation; and cooperative learning.

Data collected included the following:

- Pre- and post-declarative knowledge, and attitude measures (ANOVA)
- Student behaviour in cooperative groups was observed. Observation data was coded to identify type and focus of student behaviour. Time sampling methods were used to apply the coding to the videotapes. Observational data was calculated using percentages for each behaviour, for students with and without disabilities.
- A post-intervention questionnaire assessing student attitudes to multimedia design projects: descriptive statistics were obtained for the ten-

item questionnaire about student's attitudes towards project activities (post-intervention) - means and standard deviations.

The research looks at pedagogy in two inclusive classrooms and the design of the study enables effects of the pedagogy to be considered for all pupils, across several measures. Within this design, it considers cognitive, affective and behavioural issues. The reviewers felt that the assessment tools, such as the curriculum-based knowledge tests and the observational measures, had strong face validity, although it would have been useful if the validity of the self-efficacy and attitude measurement tools could have been discussed explicitly.

The reviewers considered the study contributes sound evidence towards the review question and evaluates, albeit in only two classrooms, important factors for consideration (cognitive, affective and behavioural issues). They rate it high in terms of the appropriateness of research design and analysis for addressing the specific systematic review question.

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

Set in four upper elementary, inclusive classrooms in the US, this study examined guided inquiry science instruction with particular reference to learners with special educational needs. The study was conducted in two phases. Phase 1 explored the learning and engagement of students with learning disabilities and/or emotional impairments, as they participated in Guided Inquiry supporting Multiple Literacies (GIsML). Phase 2 investigated the outcomes of GIsML instruction combined with teaching strategies that were developed in Phase 1. GIsML is an approach to science teaching based on authentic activities and lots of opportunities to engage in higher order thinking. Students repeat cycles of investigation to refine their thinking. These key cycles are engaging, investigating, explaining and reporting.

The research team hypothesised that GIsML instruction would provide particular opportunities for pupils with SEN because the emphasis is on a community of learning; pupils can communicate their knowledge in multiple ways; the multiple cycles of investigation involved allow a recursive learning process; and pupils can engage in problem-solving through activity. They also hypothesised that GIsML would pose specific challenges due to the cognitive, linguistic and social demands characteristic of such instruction (p 18). They described their study as a 'design experiment' by which they meant the creation 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). Phase 1 consisted of an observational phase, where data gathered from multiple sources was used to generate narrative case studies of pupils' participation in guided inquiry science classrooms. The findings from these cases were used to generate, in collaboration with the participating teachers, advanced teaching strategies and these were implemented and evaluated in Phase 2.

The reviewers note that there were some ethical concerns whose consideration are implied but not explicitly discussed: the large amount of testing that the pupils took part in and teachers right to withdraw. The research and development nature of the paper may mean that these had been addressed at an earlier stage.

The sampling frame was a previously-established 'Community of Practice' network of primary teachers and university researchers; a 'Community of Practice' 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.

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 shows 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 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.

The reviewers agreed that the study took appropriate steps to assure reliability and validity of data-collection and analysis processes. For instance, the researchers reported that '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, pre and post-assessment data.

The researchers conclude that the teacher's use of 'advanced teaching practices' within the study enable all students to make gains in their understanding (p 29). The advanced strategies are associated with special needs and low achieving students developing changes in understanding that are comparable with those of those identified as 'normally achieving students'.

The reviewers recorded no serious weaknesses in this study. They did, however, note that the complexity of the design intervention would pose challenges with regard to replicability. They also noted that the small number of students with SEN limit the study's generalisability. On the other hand, they considered the study to have high face validity insofar as practitioners in inclusive settings would be able to identify well with the study and in this sense generalisability could be deemed quite high. The reviewers also consider that the researchers' conclusions are highly trustworthy and that the study offers high weight of evidence for the review question.

The reviewers noted that the focus of this study is highly relevant to the in-depth research question. The conceptual focus of the research is the participation and learning of students with learning disabilities/emotional difficulties in mainstream science classrooms. The pedagogy in question is being developed by community of practice of science teachers and is strongly influenced by their values and practices related to their subject discipline. The paper raises the idea that teachers need to develop their knowledge collaboratively and further than this pertains to 'the subject-specific knowledge of instruction'. This makes the study highly pertinent to this in-depth review.

4.3.9 Rieth et al. (2003) An analysis of the impact of anchored instruction on teaching and learning activities in two ninth-grade language arts classes

Set in ninth-grade inclusive classes in a US, middle-class, high school and focusing on the quantity and quality of teacher-student interactions within language arts lessons, this study investigated an approach called Anchored Instruction (AI). AI is an instructional technique that derives from cognitive science. The researchers describe it as involving a problem situation that is best presented using a video segment or movie. They explain that the 'video is used to provide background information about the target event or problem situation and to create a rich context that facilitates the development of shared experience or an 'anchor' to facilitate learning (p 174). The intention is that learners are positioned as active participants who interact and analyse a range of different approaches and viewpoints to addressing problems. The authors say 'they are forced to ask hard questions, evaluate data, analyze information, describe issues, challenge assumptions, reflect on their background knowledge, discuss new information, and conduct research to

generate links between new information and their existing knowledge' (p 174).

One teacher's experience of AI, her integration of AI into her classroom practice, the impact of AI on teaching and student learning, and the support mechanisms needed to facilitate its integration, were investigated in this evaluation study. The teacher was trained in AI methods and students were taught research skills necessary for the completion of their projects within the AI approach.

Teacher and student interviews were conducted before and after participating in AI. Throughout the intervention phase of the study (i.e. during which time the teacher implemented AI), the research team systematically observed and recorded classroom interactions; this was the most significant aspect of the data collection and analysis. In addition, one researcher met the teacher regularly to discuss her perceptions and review her lesson plans and her need for support.

The researchers describe five phases of AI implementation. The first phase, 'setting the stage' focused on the activities geared to help students develop interviewing and research skills that would be required to complete their projects. Phase 2 was called 'watching the anchor/retelling'; in this phase, students watched the video (the anchor) and were introduced to the key themes in the class novel they were studying (*To Kill a Mockingbird*).

After watching the video, they discussed and identified events and themes. Student comments and questions were recorded on sentence strips for easy reference. The researchers termed Phase 3 'segmenting' and this involved dividing the movie into meaningful scenes. This was designed to enhance the development of shared expertise about the anchor. Segmenting strategies included identifying logical breaks in the video based on scene changes, characters' appearances within a scene, and so on.

Phase 4 was called 'characterisation'. Here students worked in small groups of about five on activities designed by their teacher to explore more fully the relationships in the novel. They selected and discussed video clips which they shared in the small ~ e group and in the larger, class group.

Phase 5 was termed 'student research and presentations'. Here students remained in small groups of four or five; they developed a research question based on issues that arose in their discussion of the anchor; each member of the group participated in the creation of a final multimedia presentation where they showcased their work and shared their understanding. In this phase, the teacher coached students about research strategies, mediated discussion, helped the students link new and prior knowledge, demonstrated presentation techniques, and prompted solution strategies. The culminating activity consisted of each small group presenting their research using PowerPoint.

The reviewers criticised the lack of explicitness in relation to some aspects of data collection, and, more particularly, data analysis. They concluded, however, that adequate efforts were made to ensure reliability of data collection but that these were inadequate in relation to the process of data analysis.

The evidence from the study shows that in AI, the quantity and quality of high level interaction rose, as measured by length and level of teacher and student questions and answers. More specific findings included the following: while the number of questions asked by teachers across the phases of the study remained the same, the length of questions increased during AI; the number and length of student responses to questions changed substantially, with students participating more frequently, and providing longer or more elaborated responses to teacher and student questions; and more thought-provoking questions from the teacher led to more thoughtful responses from students. In addition, the study found that video can be used to 'bypass the text', thus enabling all students to have access to content and concluded that their study demonstrated support for AI as a 'promising intervention for high school students with disabilities because its implementation correlated with increased student participation, attention to task, and understanding of content' (p 181).

The reviewers identified some weaknesses in the study. There are no details about participants' consent, permissions or anonymity, and standard deviations are not reported where they might give useful insight into the data. The design of the study and the conclusions drawn from it do not unpick the influence of teacher, technology and subject content variables on the results, hence the reviewers assigned a 'medium' regarding this aspect. However, this is a preliminary study and the inclusive pedagogy aspect of the study has strong relevance to the systematic review; overall, the reviewers rated this study's weight of evidence as of medium trustworthiness for addressing the in-depth question.

4.3.10 Sideridis et al. (1998) An intervention strategy to enhance spelling performance and social interaction and to decrease inappropriate behaviours of students with mild disabilities and typical peers in an inclusive instructional setting

The participants in this study were three students with mild disabilities and three typical peers enrolled in fulltime in a general education, sixth-grade classroom in a suburban primary school in the USA. All three students with mild disabilities were receiving supplementary services in a special education classroom and were included in the study because they represented three distinct

categories of children (learning disabilities, mild mental retardation and attention deficit disorder. Three typical peers (Ted, Kate and Helen) were also selected by the teacher and academically described as low, medium and high achievers in spelling (based on the teachers' evaluation of their spelling performance).

The study, as indicated by its title, evaluates an intervention strategy in which focuses on spelling and appropriate social behaviour. Spelling during the baseline condition consisted of two activities (1) a spelling bee and (2) a study of word definitions (p 112). The first activity was implemented for 30 minutes, twice a week. The second activity consisted of writing the definitions of the spelling words from a dictionary. This activity was implemented for 30 minutes, once a week.

During the study, class-wide peer tutoring (CWPT) was adopted as the strategy through which spelling was taught and assessed. Thus, within each team, pairs were formed at random in order to play the tutor-tutee spelling game. The role of the tutor was to read aloud a word from a weekly list of spelling words. The role of tutee was to spell the word correctly; the tutor awarded two points and proceeded to the next word. If the tutee misspelled a word, the tutor read aloud the correct spelling, and the tutee practised the word three times in order to receive one point. The reversal ABAB design (Baer et al., 1968) was employed in the study to evaluate possible functional relationships between the implementation of CWPT procedures and changes in the social interactions, classroom behaviours and academic achievement of students with and students without mild disabilities. The student satisfaction survey was conducted within the first half of the ABAB design.

The objectives of this study (p 110) were as follows:

- to assess the amounts and types of within-classroom social interaction of students with mild disabilities and their typical peers during the implementation of class-wide peer tutoring (CWPT) and teacher-mediated instruction
- to examine the amounts of inappropriate behaviour during both conditions
- to measure the effects of these procedures on the spelling performance of three studies with middle disabilities and three of their typical peers
- to assess the social validity of both instructional procedures within an ABAB experimental single-subject design

The data collected included the following:

- Observation data to determine the duration

of social interaction. The duration of social interactions was calculated by dividing the amount of time engaged in social interactions by the total session time (percentage of session time).

- Classroom observation
- Weekly spelling test
- Student satisfaction self-completion questionnaire

The authors provided information about reliability of data collected. 'All spelling tests were initially scored by the teacher and then independently rescored by the primary investigator for accuracy. Reliability of the social interaction observations was conducted for 15 percent of the total observations a at least once in each condition' (p 113). The behavioural assessment was conducted using the New Code for Instructional Structure and Student Academic Response (NCISSAR Carta et al., 1992). This was used by three trained observers who had reached reliability estimates of 80 per cent or higher.

Although only a sample of the class was used in the study (three disabled children and three typical peers), the pedagogy was used across the whole class. Therefore, this is an evaluation of a whole class technique, based on a sample of that class. The researchers conclude that class-wide peer tutoring was an effective instructional strategy for increasing the social interactions, reducing inappropriate behaviour and enhancing spelling for the sample group.

Overall, the study was considered to have medium relevance to the in-depth research question as the reviewers felt that this research study did not include the whole class.

4.3.11 Stevens and Slavin (1995a) Effects of a cooperative learning approach in reading and writing on academically handicapped and nonhandicapped students

This study focuses 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, 1995a, p 241) through participation in cooperative learning team activities. CIRC is a cooperative learning approach to teaching elementary reading and language arts. The program applies recent findings from research on cognitive psychology, reading instruction, writing instruction, teacher effectiveness, and cooperative learning in a comprehensive model for literacy instruction. The CIRC program 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). The authors state that the purpose of the research was to 'extend previous research on the effectiveness of the CIRC program' (p 247). Two previous studies, lasting 12 and 24 weeks respectively, showed that 'CIRC increased students' achievement in reading and language arts in third and fourth grade' (p 247). These studies had included a small number of 'special education students', but too few to generalise findings.

The goals of the current research (p 248) were as follows:

- to investigate the effects of long term implementation over two years
- to extend coverage of grades from third and fourth only to second through to sixth grades, particularly as there is little research on the effect of cooperative learning below the third grade
- to investigate more fully the 'academic and social outcomes of using CIRC as an approach to mainstreaming academically handicapped students'
- to study 'the effects of strategic instruction provided in reading comprehension on students' metacognitive awareness and control over these processes'

The variables measured were as follows:

- reading vocabulary
- reading comprehension
- language mechanics
- language expression
- metacognitive knowledge of reading processes
- attitudes towards reading and writing

This was a case controlled trial. Progress in reading and writing of 1,299 students in 31 experimental classes from Grades 2-6 in three suburban working class schools using the CIRC program was compared with progress in 32 control classes in four schools using traditional approaches to teaching reading and writing. The schools were matched on socioeconomic 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, the special education population, including 'learning disabled', was 12%. In the experimental group, 11% of the total school population was identified as 'learning disabled' and 10% of the control population was identified as 'learning disabled' (p 248).

The issue of reliability was addressed by the authors 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, however, discussed. 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.

The issue of generalisability is addressed explicitly: ‘the schools in this study served primarily suburban working-class neighborhoods, 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 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’ (p 258).

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 the researchers do not acknowledge this.

There is considerable detail regarding the pedagogy used in the approach and overall the research is weighted as medium (to high) in relation to relevant to in-depth question.

4.3.12 Summary table

Table 4.7 presents key information about each of the studies for summary reference and to enable an easier comparison between studies.

4.3.13 Trustworthiness of studies

The 11 studies were judged by the reviewers using the EPPI-Centre data-extraction procedures. Reviewers independently considered each article in relation to data-extraction questions, and subsequently agreed their responses. One question, constituting weight of evidence A, asked: ‘Taking into account of all quality assessment issues, can the study findings be trusted in answering the study questions(s)?’. Table 4.8 shows that four of the eleven studies were allocated a high rating. Additional weight of evidence (WoE) judgements were applied as part of the review-specific data-

extraction, all of which offer judgements regarding the trustworthiness of the studies. WoE B refers to the appropriateness of research design and analysis for addressing the question of the specific systematic review. WoE C refers to the relevance of the particular focus of the conceptual focus, context, sample and measures for addressing the question 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 reviewers independently evaluated the studies against these criteria and moderated their judgements. The outcomes of this exercise are shown in Table 4.8.

A further question about the quality and trustworthiness of each study was asked, posed for the reviewers as: ‘Have sufficient attempts been made to justify the conclusions drawn from the findings so that the conclusions are trustworthy?’. The reviewers rating are tabulated in Table 4.9 and indicate that five of the studies were allocated a high rating.

Table 4.9 Trustworthiness of conclusions

Trustworthiness of conclusions	Number	Studies identified by first author
High	5	Ferretti et al.(2001) Miller et al. (1998) Okolo and Ferretti (1996) Stevens (1995) Morrocco et al. (2001)
Medium	4	Lederer (2000) Palinscar et al. (2001) (medium-high) Rieth et al. (2003) Sideridis (1998) (medium-low)
Low	2	Goatley (1996) (low-medium) Mastropieri (2000)

Both trustworthiness and weight of evidence ratings are taken into consideration below in a synthesis of the evidence from these studies.

An interesting pattern is seen for some of the studies. For example, Miller scores medium on WoE A and high on WoE B and C, and yet scores high on WoE D. This seems to go against the heuristic that a study score high on WoE A, B and C to obtain a high WoE D. This pattern has been found in previous and other reviews (Rix et al., 2006; Gough, 2007). This is because the Review Group (as in other reviews, such as Gough, 2007) weighted the focus in relation to the review-specific questions relatively heavily. In particular, the description of the classroom practices within the context of the study (i.e. review-specific issues) influenced the WOE D rating, a pattern

Table 4.7 Summary of key information

Authors	Country	Educational setting(s)	Curriculum	Measured outcomes
Ferretti et al. (2001)	USA	Primary school Fifth grade classrooms in two urban intermediate schools	History Use of a narrative framework to support students' understanding of 19th century westward migration in the USA. Encouraging notions of history as narrative, bias, the need to qualify conclusions	Knowledge, historical inquiry skills and attitude (confidence and pleasure) Sense of self-efficacy
Goatley (1996)	USA	Primary school Neighbourhood school in a mid-sized midwestern city	Literacy - first language Four component literature-based reading programme: reading, writing, instruction, large group discussion Literature	Level of concentration and on-task behaviour Appropriate behaviour in group discussion Literacy and oracy
Lederer (2000)	USA	Primary school Fourth, fifth and sixth grades in a public elementary school	Social studies	Comprehension of topic
Mastropieri (2000)		Primary school Fourth-grade class of 9- and 10-year-olds	Social studies	Recall of subject knowledge
Miller et al. (1998)	USA	Primary school US mainstream elementary school	Mathematics	Multiplication acquisition and proficiency
Morocco et al. (2001)	USA	Other educational setting USA middle School, providing for grades 6-8 (aged 11-14) - inferred age range (not explicitly stated)	Literacy - first language	Teacher implementation of a teaching approach Quality of student journal entries and assessment essays
Okolo and Ferretti (1996)	USA	Primary school American elementary school	History Industrial Revolution	Levels of subject knowledge Levels of academic engagement Attitudes to multimedia projects and cooperative learning. Level of self efficacy
Palincsar et al. (2001)	USA	Primary school Upper elementary school	Science	Students' experiences in guided inquiry Students subject knowledge/ Level of scientific understanding.
Rieth et al. (2003)	USA	Secondary school Ninth-grade students in a high school	Literacy - first language	Raised academic attainment and enhanced social interaction/involvement
Sideridis (1998)	USA	Primary school Suburban elementary school	General Literacy - first language Spelling	Frequency of inappropriate behaviour Spelling skills Duration of positive social interactions
Stevens (1995)	USA	Primary school Three elementary schools	Literacy - first language Reading and writing	Raised academic attainment and enhanced social interaction/involvement

Table 4.8 Weight of evidence (WoE) ratings for individual elements for addressing the systematic review question

Researchers	Weight of evidence A Taking into account of all quality assessment issues, can the study findings be trusted in answering the study questions(s)?	Weight of evidence B Appropriateness of research design and analysis for addressing the question, or sub-questions, of this specific systematic review	Weight of evidence C Relevance of particular focus of the study (including conceptual focus, context, sample and measures) for addressing the question or sub-questions of this specific systematic review	Weight of evidence D Taking into account quality of execution (question M.11), appropriateness of design and relevance of focus, what is the overall weight of evidence this study provides to answer the question of this specific systematic review?
Ferretti et al. (2001)	High	High	High	High
Okolo and Ferretti (1996)	High	High	High	High
Palincsar et al. (2001)	Medium-high	High	High	High
Miller et al. (1998)	Medium	High	High	High
Rieth et al. (2003)	Medium	Medium	High	Medium
Goatley (1996)	Medium-low	High-medium	Medium	Medium
Mastropieri (2000)	Low	Medium	High	Medium
Lederer (2000)	Medium	Medium	Medium	Medium
Stevens (1995)	Medium	Medium	Medium	Medium
Sideridis (1998)	High	Low	Low	Medium
Morocco et al. (2001)	High	Low	Low	Low

which has been seen in previous systematic reviews (Gough, 2007). The Mastropieri (2000) study conforms to the heuristic that a study could obtain two WOE ratings of at least medium (including WoE B) to suggest an overall 'medium'. However, this study has a unique profile in that the trustworthiness of the conclusions are rated as 'low'. This occurs as the structure of the paper contains a conclusion section which addresses issues not directly considered in the research, although the research element within the paper has a very high relevance to the in-depth review.

4.4 Synthesis of evidence

The in-depth review identifies articles from a diverse range of contexts and with a wide ranges of learners, where within a common curriculum area

the nature of the topic and pedagogy are dissimilar. The approach taken in synthesising this disparate body of research knowledge was to use the approach established in the preceding year's review (Rix et al., 2006). This approach was agreed and established in collaboration with members of the Review Group and considered fitting where a meta-analysis of statistical outcome measures was not appropriate. The approach adopted is therefore a narrative-themed analysis which identifies and describes methodological, theoretical and empirical themes.

4.4.1 Methodological issues

The range of evidence which is being used in addressing the in-depth question is defined by the 11 identified articles. Within this sample, however, as can be seen in Table 4.8 (WoE), four studies are

seen as being weighted high in relation to their overall weight of evidence for the review question. Ferretti et al. (2001), Okolo and Ferretti (1996) Miller et al. (1998) and Palinscar et al. (2001) studies are considered to be high in terms of quality of execution, appropriateness of design and relevance of focus, in relation to the in-depth question. This suggests that these studies provide important evidence for answering the question ‘What is the nature of whole class subject specific pedagogies with reported outcomes for the academic and/or social inclusion of children with special educational needs?’.

On the same criteria, six studies were weighted medium and one study weighted as Low.

In the synthesis which follows, the weight of evidence allocated to the identified studies is taken into account. Therefore the studies in which the reviewers place the most confidence regarding weight of evidence with respect to the review question, exert a greater influence in the synthesis and also the subsequent recommendations for practice, further research and policy.

4.4.2 Synthesis of evidence

The review question has been focused on its target audience of initial teacher educators and teachers and requires evidence to understand the nature of whole class, subject-specific pedagogies that support the inclusion of children with special educational needs. The 11 studies that have been identified for the in-depth review will be the basis for developing this understanding and give an evidential base upon which to build appropriate recommendations regarding pedagogy in this context.

The synthesis seeks to identify the emerging themes from across the 11 studies and, in this way, develop a trustworthy basis for recommendations. The themes relate to the overarching features of the study which inform the nature of the whole class pedagogy.

Table 4.10 summarises key aspects of the studies that have particular relevance to the in-depth review question: pedagogical approach, curriculum area, outcomes, and the emerging themes from each that contribute to the final synthesis of evidence.

The following five themes emerged in the studies synthesised for the review question:

1. Pedagogic community
2. Social engagement
3. Modality of activities
4. Scaffolding
5. Authentic tasks

4.4.2.1 Pedagogic community

The theme of ‘pedagogic community’ (derived from two initially proposed themes which were conflated: structured programme and teacher community) refers to classroom practices that draw upon an overall approach to teaching part of the curriculum.

This approach contains within it a view of how pupils learn and consequently how teachers act to facilitate pupil learning. Teachers have access to a ‘teacher community’, a group who share these beliefs about how children learn and offer support through discussion or training (i.e. knowledge created and valued by that community). In some cases, the ‘fidelity’ of the teachers’ work in relation to the programme is assessed by the teacher themselves; in one instance (Morocco et al., 2001), by other members of the community.

This theme does not refer to ‘programmed instruction’. In this context, it refers to a clarity regarding how to construct learning activities for pupils and instances where teachers base their practice on a particular pedagogic model, which informs their teaching and structure.

The first three studies, with a high weighting for evidence, each illustrate structured programmes of different kinds within different types of teacher communities.

Miller et al. (1998), for instance, note that the teachers in the study used lessons ‘taken from Multiplication Facts 0 to 81’ (Mercer and Miller, 1992, p 55) and had taken part on a workshop on effective teaching procedures. The teachers were given practice and guidance on the approach, and detailed instruction on how to review the procedures within their work, and had ‘access to experts on the program if questions arose during implementation’. The teachers were resourced and supported in terms of the programme, from outside the school, and linked to a community with a common view of teaching the curriculum topic.

This aspect of community emerges from Okolo and Ferretti (1996), where two groups of teachers worked together within a school and used a cooperative, problem-based learning approach. For one group, this is the first time they have used the approach; for the other group, this approach is how they have worked for several years. They have established a common understanding of what cooperative based learning is, how pupils learn from it, and how to create their own study guides. In Okolo and Ferretti’s research, the ‘community’ group experienced better classroom behaviour from their students, who also obtained better scores for gains in declarative knowledge. This small ‘in-school’ community has its own set of beliefs about pedagogy and classroom practice, which apply ideas reflective of the research literature cited in the paper.

Table 4.10 Synthesis of evidence

Study/WoE	Pedagogical approach	Curriculum/ subject area	Outcomes	Emerging themes regarding nature of pedagogy
Miller et al. (1998)/High	Large group instruction of lessons from teacher scripted lesson	Mathematics Multiplication acquisition and proficiency	For all students, there was a marked increase in pre- to post-test measures; on five of the measures, performance was comparable SEN and typical groups.	Scaffolding Pedagogic community Modality of activities
Okolo and Ferretti (1996)/High	Cooperative Multimedia design projects. Teachers support groups through structured project phases	History Industrial Revolution	Outcomes measured for all students Higher level of academic engagement Improved attitude Improved knowledge for only some participants	Modality of activities Social engagement Authentic tasks-scaffolding Pedagogic community
Palincsar et al. (2001)/High	Guided inquiry-a two-phase design experiment	Science 'Sinking and floating' 'Light' 'Scientific reasoning'	Outcomes measured for all students All students (in Phase 2) achieved significant gains in understanding in learning outcomes from instruction	Social engagement Modality of activities Pedagogic community Authentic tasks
Ferretti et al. (2001)/High	Interactive groupwork to facilitate a socially-mediated learning process Use of multi-media to facilitate student presentations of outcomes of groupwork	History Use of a narrative framework to support students' understanding of 19th century westward migration in the USA. Encouraging notions of history as narrative, bias, the need to qualify conclusions	Improvements in knowledge, historical inquiry, attitude (confidence and pleasure) Improved sense of self- efficacy among all groups The implementation of SSBL was associated with positive results for students with and without disabilities.	Modality of activities Social engagement Authentic tasks Scaffolding Curriculum access
Goatley (1996) /Medium	Literature-based reading programme	Literacy - first language Four-component literature-based reading programme: reading, writing, instruction, large group discussion Literature	Greater level of concentration and on-task behaviour; appropriate behaviour in group discussion. Gains in literacy and oracy.	Authentic tasks Social engagement
Lederer (2000) /Medium	Using reciprocal in small groups during social studies	Social studies	Outcomes measured for all students All students improved on comprehension measures; students with SEN improved their ability to compose summaries.	Social engagement Authentic tasks Modality of activities Scaffolding

Study/WoE	Pedagogical approach	Curriculum/ subject area	Outcomes	Emerging themes regarding nature of pedagogy
Mastropieri (2000) /Medium	Mnemonic strategies used to present for concepts and vocabulary	Social studies 'Newcomers from Europe'	Outcomes measured for all students This raised recall for all, but there was a dramatic increase for pupils with special educational needs; popular method with students.	Modality of activities Pedagogic community
Rieth et al. (2003) /Medium	Anchored Instruction	Literacy - first language Language arts class (<i>To Kill a Mockingbird</i>)	Outcomes measured for all students Increased student participation, attention to task and understanding of content More thought-provoking questions from teacher led to more thoughtful responses from students. (Length and level of questions)	Modality of activities Social engagement Pedagogic community
Sideridis (1998) /Medium	Class-wide peer tutoring	Literacy - first language Spelling Behaviour Social skills	All pupils inappropriate behaviour decreased. Fewer instances of non-compliant and disruptive behaviour Improved spelling; increased duration of positive social interactions	Social engagement Pedagogic community
Stevens (1995)/ Medium	Explicit instruction, writing process approach and students in cooperative learning teams The Cooperative Integrated Reading and Composition Program	Literacy - first language Reading and writing	Progress made for all students in reading, writing and metacognition	Pedagogic community Social engagement Modality of activities
Morocco et al. (2001)/Low	Supported Literacy approach	Literacy - first language	Outcomes measured for all students. Quality of writing and writing fluency improved. Students with disabilities perform significantly better with supported interpretation prompts.	Pedagogic community Scaffolding Social engagement

A longer term and wider community is seen in Palinscar et al. (2001). Arising from professional development activity, teachers here had previously joined forces with university-based researchers with the explicit purpose of creating 'a community of practice'. The focus of this community was 'promoting inquiry-based learning' of scientific understanding and had developed an orientation named 'Guided Inquiry Supporting Multiple Literacies'.

Since teachers have a community of practice to draw upon, they have an understanding of why they are teaching in a particular way and have someone who shares their stance on what they are trying to achieve. In Mastropieri et al. (2000), a teacher uses a mnemonic approach with her own class to teach a social studies topic. In doing this, she is drawing on her own previous professional studies in this area and, as evidenced by the paper itself, published with two leading authorities, this suggests a strong engagement with a particular 'pedagogic community'.

4.4.2.2 *Social engagement is intrinsic to the pedagogy*

The theme of social engagement is illustrated in many of the studies: Ferretti et al. (2001), Goatley (1996), Lederer (2000), Morocco et al. (2001), Okolo and Ferretti, (1996), Rieth et al. (2003), Sideridis (1998) and Stevens (1995). This refers to situations in which the social interactions of the classroom are valued. In its 'strongest' form, social engagement is held to be the site for the creation of knowledge. The papers which use a cooperative or group based learning approach (e.g. Ferretti et al., 2001; Okolo and Ferretti, 1996; Palinscar et al., 2001) explicitly use social interactions as pedagogical devices, and each is rated as high in relation to the specific review question.

Research by and Goatley (1996) and Palinscar (2001) describes how a learner with SEN needs to develop the skills to access and to consider the knowledge of other class members, in order to develop their own understanding and to be given opportunities to develop the ability to share their own knowledge successfully. Sideris (1998) emphasises the friendship and social relations aspects of the classroom as important in their own right, but also achieves significant academic outcomes from an a pedagogy based on social interactions. Classroom interaction is important and is often a measured outcome in the studies. For instance, Rieth et al. (2001) measure both the length and level of students' and teachers' questions and answers (i.e. considers the quantity and quality of social interactions). In anchored instruction (AI), the learner communicates and reflects on their communication, developing the social engagement in which their understanding develops.

Palinscar et al. (2001) see social engagement as the means by which students are guided in their scientific investigations. The amount of support and assistance given to the learner enables them to become active learners, engaged with scientific reasoning and practices. The learners' social engagement is seen as allowing the teacher access to the students' thinking and reasoning, and helping them to document their thoughts, usually in a one-to-one discussion. Rehearsing and mini-conferencing allows the student to develop their social engagement in the context of the curriculum area. By monitoring aspects of the students' social engagement, the teacher can successfully access the students' thinking, highlighted by Palinscar as an important element of advanced teaching practice.

So the theme of social engagement highlights that successful pedagogies use, monitor and develop the learners' social interactions as a way of developing, or facilitating the development, of knowledge.

4.4.2.3 *Flexible modes of representing activities*

Learners interact with the curriculum area through the activities which the teacher has usually prepared or facilitated. These activities can be presented in different modalities: for example, as visual text-based, verbal or kinaesthetic. In the identified studies, the nature of the pedagogy and how learners go about learning is influenced by the choice made by the teacher of the modality of the learner activities.

Manipulating the modality of curriculum materials emerges as a way in which potential barriers to learning may be removed and curriculum access given to a more diverse range of learners. This is illustrated in Miller et al. (1998), who describe the use of 'paper plates to represent groups in multiplication problems' and plastic discs 'used to represent objects in the group' (p 56). By changing the modality through with the concept was presented (as opposed to perhaps a verbal description, or account of the relationship between abstract numbers) students were able to discover the connection between the numbers in the problem posed and real-world objects. Students could use these objects to understand and solve mathematical problems by physical manipulation and discussion. Further, following on from the theme of social engagement, the use of a physical modality can potentially allow the learners to share their thinking with others and to 'see' what others were thinking. The teacher can have a direct view of the strategies and heuristics used by learners in solving problems and thereby monitor, or facilitate, their progress in mathematical thinking.

The use of text and textbook-based instruction can present significant barriers to curriculum access for some learners. Okolo and Ferretti (1996) note that textbooks in the social studies areas are often written at readability levels 'that exceed

many of the students' (p 223) and assume an often inappropriate depth and breadth of background knowledge. This effectively excludes many students with learning disabilities. Their research describes how a multimedia project can give students curriculum knowledge through using alternative modalities. In the successful intervention by Palinscar (2001), learners were given experiential knowledge of scientific phenomena (for example, constructing and manipulating a Cartesian diver), and supported by environmental print and graphic documentation. Changing the modality of activities was noted in studies which produced positive outcomes for all learners in the class.

Changing modality can also enable students to engage with aspects of successful learning. Okolo and Ferretti (1996) incorporated significant social engagement through structured collaborative group work; however, this was only possible because it was supported through the modality of the materials. Students viewed videotapes about their specific curriculum area and hence could access curriculum knowledge at a level appropriate to bring into the collaborative discussions.

Helping learners to present their work in different modalities also emerges as important. For example, Palinscar (2001) notes that graphics and drawings can allow learners to share their thinking and communicate what they know (where text approaches would exclude some learners). The learners in the study by Okolo and Ferretti (1996) used HyperAuthor software to create their project text and insert meaningful pictures into their work. This developed into a multimedia presentation of their project work, allowing them to communicate their subject knowledge to classmates. It is interesting that these papers focus on multimodal representation when so many in the wider map did not (as indicated in 3.2.13).

4.4.2.4 Progressive scaffolding of classroom activities

A common theme across the studies was that of scaffolding. This refers to pedagogical approaches in which planned, explicit and reflective learning activities, which begin at a level appropriate for the learner, are used to develop their subject knowledge and understanding. While scaffolding can legitimately be seen as 'what teachers do' in their interactions with pupils, this theme refers to planned and progressive subject specific activities. One example of this is found in the research by Miller et al. (1998) in which the lesson's activities progress from concrete representations with 'guidance practice and interactive discourse' (p 56) in lesson 1, to a reduction in teacher support as these concepts and discourse are internalised. The learners move from concrete to abstract representations and manipulations with scaffolded teacher support at each stage. The scaffolding also involved giving the learner tools to facilitate metacognition: for example, a mnemonic to

prompt a strategy. Lederer (2000) plans scaffolding strategies into activities and reports explicitly the time teachers spend scaffolding during the research intervention. Stevens and Slavin (1995a) describe how this approach underpins the CIRC program which they use.

...students receive cognitive support during the initial phase of practice in the form of collaboration with their peers and teacher guidance and feedback. Gradually the cognitive support is diminished by reducing the guidance from the teacher while allowing the peers to work closely with partners. (p 243)

Students may also need instruction to engage with the initial social processes. For example, in the study by Okolo and Ferretti (1996), the social processes required for engaging in a collaborative project are developed through scaffolded activities with a reflection activity at the end. This approach was not evident though in Palinscar et al. (2001) where the pedagogy was based on a recursive 'engage, investigate, explain and report' (p 18) model. This reflects a stronger constructivist approach, rather than the social-constructivist approach associated with scaffolding.

4.4.2.5 Authenticity of classroom activities

The final theme reported here is one of authenticity. Authenticity is seen where an activity is perceived as meaningful to the learner and may also reflect a 'real life' skill or activity. The theme links with other identified themes in several ways. For an activity to be meaningful, it needs to 'connect' with the learners' experiences, perceptions or values. In doing this it might begin from their current experiences. Alternatively, the activity may be authentic in terms of the 'pedagogic community'. The activities in Palinscar (2001) appear to do both - being grounded in the learners 'first hand experiences' of phenomena but also seen as authentic practices within the scientific community.

In other studies, the nature of the activities develop metacognitive skills which have real life relevance, such as engaging in effective discussion, and these skills are used in 'here and now' activities within the classroom among peers, the latter giving them authenticity at a social level. By participating in 'real life' discussions and project work, the learner is learning to document their thoughts and make their own authentic contribution to understanding the curriculum area. They are being supported in developing and understanding their own perspective, and in sharing and developing it further with peers and teachers.

4.5 In-depth review: quality-assurance results

Chapter 2 includes an account of the quality-assurance process of in-depth review.

Each study was independently data extracted by two team members using EPPI-Reviewer, with five studies data extracted by the EPPI-Centre link person for quality-assurance purposes. The quality of studies and weight of evidence was assessed using the EPPI-Centre data-extraction framework, as well as the review-specific framework.

4.5.1 In-depth review: quality-assurance process

4.5.1.1 Screening

Pairs of independent reviewers applied the inclusion/exclusion criteria to all the studies in the descriptive map to elicit studies that satisfied the requirements for inclusion in the in-depth review.

4.5.1.2 Data extraction

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

There now follows an elaboration of the results of that process for the 11 studies that were subjected to the EPPI-Centre quality-assurance procedure at the in-depth review stage. The 11 studies were independently data-extracted by two members of the Review Group, and following moderation, a final version was agreed.

Overall, there was high agreement between pairs of reviewers and, where disagreements occurred, reviewers revisited the papers and reconsidered their interpretations in the light of argument and discussion.

4.6 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. During this year, feedback from users in the preceding two years' review were used to suggest a potential direction for this third review year. Users responded to this suggestion via email. As in the second year of the review (Rix et al., 2006), most of the Review Group had conversations with practicing teachers, teachers in training, initial teacher trainers, educational psychological services and colleagues involved in teacher professional development.

Communication across the team via email, to a lesser extent conferencing, was most helpful at three points: at the point of agreeing the review's focus, agreeing the protocol, and deciding the question for the in-depth review.

At the time of writing, no evidence of impact is available. However, the results of the review will form conference presentations in 2009.

4.7 Summary of principal findings

4.7.1 Identification of studies

This review is the third and final review focusing on a consideration of pedagogical approaches with reported outcomes for the inclusion of children in mainstream classrooms. To ensure continuity with the previous two reviews, essential elements of the review process and methodology have remained constant. As with the previous reviews, this review has identified studies that included evidence of both pedagogies and outcomes for children. An ongoing concern with mainstream pedagogies appropriate for a wide range of trainee and new teachers has led us, once again, to focus on the main years of compulsory schooling, excluding early years and Key Stage 4, where pedagogy might be quite different. In this review, the focus continues to be on children within the 7-14 age range. Similarly, following an approach adopted previously, this review focuses on those studies published since the universal commitment to inclusion expressed in the Salamanca statement by UNESCO in 1994. The focus is on as wide and as comprehensive a range of relevant research studies as possible and work that was both quantitative and qualitative was included.

In common with the previous reviews and having agreed the criteria for inclusion in the review with the extended team, the mapping exercise included those studies that:

- focused on pupils who experience special educational needs of some kind
- were conducted in mainstream classrooms
- were concerned with pedagogical approaches
- indicated pupil outcomes
- pertained to the 7-14 age range
- were empirical studies
- were written in English
- were produced or published after 1994

As in the previous studies, criteria related to the quality of the research were not considered at this stage. Evaluative criteria 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.

4.7.2 Mapping of all included studies

The mapping of included studies followed the same process as that followed in previous years (Nind et al., 2004; Rix et al., 2006). 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, such as ERIC and BEI, 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 more thorough scrutiny, did not meet the inclusion criteria. All the studies which remained were keyworded using EPPI-Centre Core Keywording Strategy (EPPI-Centre, 2002), together with some additional review-specific keywords. This process permitted the building of a 'descriptive map' of studies in the review.

The full document screening from 2006 resulted in 25 papers being included in the systematic map. These papers were combined with the 109 papers in the 2005 systematic map, resulting in a final systematic map of 134 studies.

4.7.3 Nature of studies selected for in-depth review

In seeking to extract a manageable subset from the 134 studies in the descriptive map that would be of maximum interest and of use to prospective and practising teachers and training providers, the Review Group sought further advice from the Advisory Group. The review-specific keywording had included categorisation of the teaching approaches researched in the studies, had included information about social and/or academic outcomes for pupils, and had included information about the nature of the pedagogic approaches. The latter emerged as a factor which attracted interest among the Advisory Group as being potentially most useful to teachers. The Review Group was concerned to maintain their original review question, but decided to search amongst the studies to discover those which answered the following more specific question:

What is the nature of the whole class, subject-specific pedagogies, which has reported outcomes for the academic and/or social inclusion of pupils with special educational needs?

New inclusion/exclusion criteria were then applied and 11 studies emerged from the descriptive map for in-depth review. Each of these 11 studies satisfied the inclusion criteria, in that there was evidence that learning aims were set for the

whole class rather than for a smaller subset of children deemed to have special educational needs; that learning tasks were subject-specific; that the pedagogy in practice was stated and described; and they contained indicators of social and/or academic outcomes for pupils. In this way, they were deemed by the Group to be of direct relevance and usefulness to the Teaching Development Agency and those institutions in which student teachers are trained. Each of the 11 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.

4.7.4 Synthesis of findings from studies in in-depth review

The 11 studies in the in-depth review reflect those in the wider map in that there is a preponderance of studies conducted in the USA. None of the studies for the in-depth review was based in the UK. The diversity of their research orientation means that, as a group, they did not lend themselves to a statistical synthesis. However, a narrative, thematic synthesis was deemed appropriate and was carried out following agreement among members of the Review Group. The studies were examined in relation to the specific in-depth review question and in relation to the weight of evidence for answering the review question.

Only three of the 11 studies were deemed to be high for each individual element for addressing the systematic review question (see Table 4.10) and this was the first methodological concern in synthesising the evidence. Furthermore, an issue remained about the scale of evidence available to address the research question. The studies were based on relatively small samples and, while some were controlled, they were not randomised. Nevertheless, three studies (Miller et al., 1998; Okolo and Ferretti, 1996; and Palinscar et al., 2001) were deemed high on weight of evidence for all three identified elements and five further studies were deemed of medium/high weight of evidence across all three elements (Ferretti et al. 2001; Goatly, 1996; Lederer, 2000; Rieth et al., 2003; Stevens, 1995). One study (Sideridis, 1998) scored medium on one element, while one study (Morocco et al., 2001) scored low (Table 4.10). There is reason to have confidence in the evidence collected in these studies. However, generalisation to a larger population may be more problematic.

The review question is about gaining insights into how teachers facilitate inclusion of pupils with special educational needs through their subject specific pedagogies. More specifically, the focus is on providing teachers and their educators with an understanding of the nature of whole class, subject-specific pedagogies that can influence the inclusion of pupils with special educational needs. As seen in Table 4.5, five studies focused

on literacy, one on each of mathematics and science, two on history and two on other social science areas. There is evidence, albeit limited, about whole class, subject-specific pedagogies, linked to outcomes, for the academic and/or social inclusion of pupils with special educational needs. The findings of the review offer some scope for making tentative recommendations. First, there is a summary of the substantial theoretical and empirical themes emerging from the synthesis, then the strengths and limitations of the review are identified, and finally there the implications are considered in the form of recommendations in relation to policy, practice and further research.

4.7.5 Substantive themes on whole class subject specific pedagogies

Five important inter-related themes emerged in the synthesis. These themes emerged from across all the studies, with each study reflecting at least two of the themes and others reflecting all five (Table 4.10).

The first theme of ‘pedagogic community’ is based on eight of the studies (Table 4.10): three rated ‘high’ and four rated ‘medium’. These studies suggest that teachers need to understand the aims of the structured programme and the subject. Thus, teachers who adopt inclusive pedagogies begin with an understanding of the characteristics, skills and knowledge associated with the subject to be taught. These studies also suggest that teachers need to have a view of how pupils learn, and to use this information to inform how they might then act to facilitate learning. The three studies with high weighting for evidence (Miller et al., 1998; Okolo and Ferretti, 1996; Palinscar et al., 2001) illustrate the effects of teachers having had the opportunity to establish common views about teaching and learning within a collaborative community of teachers and other educationalists. There is good evidence to suggest that teachers who belong to a pedagogic of practice can, as a consequence, have an understanding of what they are trying to achieve in terms of academic and/or social inclusion, and develop appropriate pedagogic models to help achieve those aims.

The second theme was identified as ‘social engagement is intrinsic to the pedagogy’. This theme is also based on nine of the studies: three rated ‘high’, five rated ‘medium’ and one rated ‘low’. These studies shared a view that social interaction or social engagement is the basis for the creation of knowledge. Consequently, enabling learners to develop skills in, and have an understanding of, social interactions was seen in all these studies as a means to enhancing the academic and social inclusion of children with special educational needs. Successful pedagogies are based on social interactions which use, monitor and develop pupils’ social engagement, as an end in themselves, and as a way of facilitating the development of knowledge.

The third theme is ‘flexible modes of representing activities’ which, again, is based on eight of the studies: four rated ‘high’ and four rated ‘medium’. These studies acknowledge that text and textbook-based instruction can present significant barriers to curriculum access for some learners. There is good evidence that pedagogies which present children with activities which are visual, verbal and kinaesthetic, as well as text-based, can remove barriers to learning and give curriculum access to a wider group of learners. Introducing a range of modalities from simple paper plates to multi-media software can include children with special educational needs in a number of ways. In one study, by changing the modality of activities, children were able to see the connection between mathematical problems and real world situations (Miller et al., 1998). Moreover, the use of HyperAuthor software enabled children to use graphics and drawing to share their thinking and demonstrate what they knew in ways they would have found difficult through text (Okolo and Ferretti, 1996).

A fourth theme is ‘scaffolding’ and this arises from five of the studies: three rated as ‘high’, one rated as ‘medium’ and one rated as ‘low’. This takes place through interactions between teachers and children, and among children, and is thus linked to the earlier theme of ‘social engagement’. In the context of this review, there is good evidence that inclusion is enhanced when pedagogical approaches are planned with, and made explicit, to learners. In addition, the studies assembled indicate that successful pedagogic approaches involve subject-specific learning activities which begin with an awareness of the needs of the learner and then develop their understanding, knowledge and skills through small incremental steps.

The fifth theme ‘authenticity of classroom activities’ arises from five of the studies: three rated as ‘high’ and two rated as ‘medium’. Authenticity is seen where an activity is perceived as meaningful to the learner because it is grounded in the learner’s own experiences or, to a real life skill or activity, to which the learner can relate. It also encompasses being seen as an authentic subject-related activity by the pedagogic community. The evidence suggests that contextualising what is to be learned in the form of a real life or learner relevant inquiry or problem has potential to foster academic and social inclusion of pupils with special educational needs

4.8 Summary of results of synthesis

The in-depth question, to which this synthesis is addressed, asks what is the nature of whole class, subject-based pedagogies with reported outcomes for the academic and social inclusion of pupils with special educational needs. The results of the synthesis, in relation to this question, can be summarised as follows.

The pedagogy is mediated by a teacher who is part of a 'pedagogic community', either within the school or, more often, from outside the school. The teacher's pedagogical practice is supported by this community with a shared model of how children learn. Therefore the teacher has an understanding not only of how to teach a curriculum subject, but also an understanding of why they are using this approach. The pedagogy gives importance to the social engagement of learners and includes activities in which social interaction is seen as the means through which student knowledge is developed. The learning activities use different modalities, making the subject knowledge accessible to a diverse range of learners. Further, the development of the learner's understanding occurs through the planned scaffolding of the subject's cognitive and social content. In doing this, the teacher uses activities which the learner finds meaningful and which represent the subject area in a way that is valued by the pedagogic community.

CHAPTER FIVE

Implications

As with reviews carried out over the previous years, this review set out to answer a specific question about the pedagogical approaches that 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 the nature of whole class, subject-specific pedagogies with reported outcomes for pupils with special educational needs. The aim was to examine the evidence from which useful findings, conclusions and implications might be drawn that were of specific relevance to student teachers, teachers, teacher trainers and other educators. This chapter summarises the strengths and limitations of the review and offers recommendations from the findings for policy, practice and research.

5.1 Strengths and limitations of this systematic review

An important strength of this systematic literature review is that it asked relevant questions. As happened in the previous two year's systematic reviews (Nind et al., 2004; Rix et al., 2006), the usefulness of seeking to answer the overall question and the refined question for the in-depth review was reiterated by the Advisory Group. The way the question is formulated reflects discussion with practitioners and their concern with real-world contexts across a three-year period, as well as discussion with colleagues at the EPPI-Centre who guided its precise wording. Using specific inclusion and exclusion criteria, those studies pertaining to whole class, subject-specific pedagogies have been systematically assembled. The explicit focus on classroom practice has been identified as likely to prove useful to teachers and teacher-trainers within and across curriculum areas. The review also encompasses studies that represented the phases of schooling - nine from a primary school and two from a secondary school (Table 4. 4). There was high quality-assurance for the review: screening, data-extraction and quality assessment were conducted by two independent members of the Review Group (or a member of the Review Group and an 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 majority of the studies. Of the 11 studies, 10 were

deemed at least 'medium' for weight of evidence on all the relevant criteria and four of these studies were rated as 'high' (see Table 4.10); only one study emerged with an overall rating of 'low'.

Another strength is capacity-building. As occurred in the previous two years, members of the Review Group experienced and trained in systematic review skills continued to support colleagues in developing new skills. Rix et al. (2006) noted that, 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, members of the Review Group enhanced their capacity to evaluate what constitutes evidence and what counts as effectively including pupils with special educational needs. In this review, the capacity building in systematic review skills could have been greater with more time and resources, but appreciation of evidence-informed practices and research capacity was enhanced. However, the review team remains largely unchanged from the first and second reviews (Nind et al., 2004; Rix et al., 2006) and this factor has confined the development of these review skills to this group and reduced the capacity-building impact of the review to some extent.

The scope of this systematic literature review inevitably has limitations. Due to the way in which was set up, as in 2006, 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. Again, as in the first and second reviews (Nind et al., 2004; Rix et al., 2006), 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.

A further limitation is the national context of the studies assembled for the in-depth review reflecting the systematic map. All the studies were US-based with none based in the UK, thus making obvious difficulties for generalising to the situation in this country. Yet a more serious limitation concerns the strength of the evidence base overall. Only three studies had a high weight of evidence assessment across all relevant criteria (Table 4.10) and the limited number of participants within the various studies renders generalisability across large populations problematic.

An issue which might be considered as a potential limitation is the largely positive outcomes reported in the selected eleven studies. It could be that this reflects a bias in the selection criteria or within the studies themselves, from a publication bias towards 'successful' results. The review was seeking to find examples of classroom practices which were successful in including a range of children in classroom activities. There was a purposive search for research evidence which might reveal these practices. This, combined with a potential publication bias, reduces the incidence of negative outcomes within the final research data. This means, in common with other reviews of this kind, there is no opportunity for falsification of approaches across studies within the EPPI-Centre database. This could be a recommendation for further research which further interrogates the research map. There is also a lack of random assignment between, and rigorous control of, comparison groups with the studies overall. This reflects current approaches within educational research within the area of inclusion and is also found in the first and second reviews (Nind et al., 2004; Rix et al., 2006). However, at the level of the individual research studies, the ratings against the weight of evidence criteria suggest that the research weighted highly in the synthesis can be trusted in terms of informing an answer to the specific research question.

Attempts to condense a research literature on pedagogical practices for inclusion is not unproblematic. In keeping with the second review, this Review Group agrees that:

While real-world complexity is a strength in this literature review, questions about 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 (Rix et al., 2006, p 82).

The review has created a specific range of selection criteria and these have shaped the insights that have emerged from the data and which have been used to answer the review questions. However, there are alternative review questions which could be asked regarding how to teach children with special educational needs in mainstream classrooms effectively in ways that benefit the academic and social inclusion of all children. There are also alternative exclusion and inclusion criteria which could legitimately be constructed. In this way, the current review can be seen as drawing on a limited research base and adopting a particular perspective on this literature. Other reviews would offer different insights into the area.

5.2 Implications

Although the Review Group offers recommendations for policy and practice, it is necessary to repeat the caveat from the second review (Rix et al., 2006) that, as the major thrust of the findings and recommendations are from the US-based studies, their application to the United Kingdom needs to be considered with appropriate caution. Overall, there remains a shortage of evidence that originates in the United Kingdom about the nature of teaching approaches that effectively include children with special educational needs in mainstream classrooms.

5.3.1 Policy

The emergent theme of 'pedagogic community' has direct implications for policymakers. The research which informs this review suggests that children with special educational needs are included in whole class activities in situations in which the teacher has access, and is part of a group with a particular view of pedagogy and learning. If teachers are to become part of, and sustain membership of, such a group, then they will need support and encouragement in doing so. The most obvious route for this is to begin contact with appropriate groups during initial teacher training and to develop this membership as part of their continuing professional development (CPD). The existing evidence suggests that teachers need an understanding of the characteristics, skills and knowledge inherent in the subjects to be learned. This is an expected part of their role and one that may be enhanced through ongoing CPD and contact with a pedagogic community.

Such CPD should enable teachers to reflect on all aspects of education, especially inclusive aims and practice, knowledge about how children learn, and pedagogies most appropriate to facilitate inclusion and learning. The existing research base also offers the suggestion that creating communities of practice involving teachers, teacher educators, and academics may be an important strategy to ensure ongoing reflection on aims, inclusion, learning and teaching. Since the studies are research studies, the classroom teachers has access to, and is often, a member of a research team. This gives them access to a pedagogic community and this contact could be developed if teachers were supported in researching their own classroom practices as part of CPD.

The other themes can be considered as demonstrating subject specific curriculum skills and these are facilitated by the teacher: developing authentic tasks; presenting tasks in appropriate modes of representation; and scaffolding cognitive and social skill development in ways that utilize the social engagement of the learners. In England and Wales, learning support assistants and teaching assistants are often charged with the direct support of pupils with special educational needs. Consequently, they will need a sound understanding of the pedagogic approach being delivered and their role within inclusive classrooms will need to be considered. Sufficient planning and preparation time will be essential if, for example, curriculum activities are to be presented in new, or a range of, modalities.

The findings of this review will need to be disseminated to educators, including student teachers, support staff, special needs advisors, inclusion advisors and OfSTED inspectors.

5.3.2 Practice

The research evidence considered this year adds evidence to the suggestion that whole class, subject-specific pedagogies that can include pupils with special educational needs cannot be reduced to simplistic formulae. However, the emerging themes do give insights into the nature of such practices.

The complex nature of inclusive pedagogies means that teachers need opportunities to reflect on their practices in the light of the themes identified in this review. As cited previously, policymakers should act to support the development of this reflection in early training and continue throughout an individual's teaching career. Involvement in ongoing research with educators and academics outside the classroom context would be a way of strengthening the research evidence base and involve teachers in the development of case study material. Systematic sharing and dissemination of good practice would further strengthen communities of practice in the promotion of the kind of classroom pedagogy that would maximise inclusion of pupils with special educational needs.

This review highlights the mediating role of the teacher in scaffolding learning within and beyond subject domains; and knowledge as contextually-grounded in the real life experiences of pupils. This view is further enhanced by the evidence that inclusive pedagogies involve activities which are authentic and relevant to the needs of the learner and are delivered in incremental steps using a wide range of modalities. Teachers at all stages of their careers need opportunities to reflect on and develop authentic learning activities which are subject-specific and grounded in the real life experiences of pupils. It is worth emphasising that these recommendations for practice are derived from studies of teachers whose classroom practice is supported as part of research studies and each of which might not feature all of these characteristics. To derive these themes and then consider all of them as potentially necessary presents a very demanding brief for an unsupported classroom teacher. In Ferretti et al. (2001), the researchers developed the instructional unit to be delivered in the classroom, and based this design upon principles of teaching for understanding, which took into account potential difficulties which might be experienced by children with SEN and which had authenticity for the pedagogic community. They met with the classroom teachers prior to the study beginning and developed the approach further through discussion to meet the needs of the classroom. There were also weekly discussion meetings. This suggests the level of support that might be required in helping teachers to develop new subject-based, whole class approaches.

Inclusive subject-based classroom practice needs to bring together effective instructional techniques and 'field-tested' curricular materials (for example, as seen in Okolo and Ferretti, 2001 and Miller et al., 1998). The Review Group would support Palinscar et al.'s (2001) conclusion that generic teaching approaches, for children with special educational needs 'do not reflect the unique demands of subject-specific matter and are not recognized as advancing the learning of all students' (p 30). With this caveat, the review suggests the importance of social engagement as a means to enhance the academic and social inclusion of children with special educational needs and highlights a social constructivist perspective as being significant. Teachers need opportunities to learn and reflect this view of learning and to develop subject-specific pedagogies which use, monitor and develop pupils' social engagement, both as an end in itself, and as a way of facilitating the development of knowledge.

5.3.3 Research

The studies which informed the in-depth review indicate that classroom-based research can inform our understanding of the nature of whole class, subject-based pedagogies which include children with special educational needs. What also emerges

is that this form of research has the potential to support, and in some cases provide, a pedagogic community for the teacher. In Mastropieri et al. (2000), the teachers are at the heart of this process, driving the research based on their own pedagogic interests and the needs of their class. Elsewhere, examples are of teachers giving feedback to modify existing approaches which are to be delivered in their classroom (Okolo and Ferretti, 1996) as part of the research process. The research process has acted to enable teachers to evaluate, or play an active part in the evaluation, of classroom practices and linked them with a wider pedagogic community. This process has the potential to support the development of teachers classroom pedagogy and highlights the value of linking classroom practitioners with academic researchers, and vice versa. The theme of pedagogic community has been suggested as a significant theme in the in-depth review. It would be useful to explore the extent to which this might be an artefact of published research selected by the inclusion and exclusion criteria, and to consider the forms and effects of communities of practice in more detail.

The implications for research are also in keeping with the points made previously in the first and second reviews (Nind et al., 2004; Rix et al., 2006). There remains a need for rigorously designed, classroom-based research within an English context and which investigates subject-based pedagogies in the context of social and academic outcomes for pupils with special educational needs. More particularly, studies focused on whole class, subject-based pedagogies will be needed to establish how and with what effects teachers include pupils with special educational needs. It would be useful, given the low populations involved to date, to explore the issues involved in applying the findings emerging from this review. This is a complex area to research. The study by Palinscar et al. (2001), included in the review, examined academic, social and other outcomes and their interrelationship, acknowledging the necessity of a multi-faceted approaches that considers different level of analysis and which is reflective of real world contexts.

This review indicates that the important features of subject-based pedagogies are likely to be interrelated in their effects and future research will need to analyse their relative contributions in terms of transactive associations rather than isolated, independent effects.

While the evidence available bears on core curriculum areas of literacy, mathematics, science, history and social science, there is a gap in terms of other curriculum areas.

The role of adults, others than teachers, in the classroom is important in the context of supporting children with special educational needs in UK schools. Research in this area is highly pertinent to extending the knowledge base established by the review, in developing an understanding of the nature of effective practices in whole class, subject-based classes which promote the learning of all children in the classroom.

CHAPTER SIX

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All members of this team have experience in teaching and producing distance learning materials and have worked in the areas of special education and/or inclusive education at undergraduate and postgraduate levels.

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, Early Intervention for children with Down syndrome, intellectual access to Heritage sites and the value of simplified materials in the inclusive classroom.

Kathy Hall, who is Professor of Education at the Open University, recently headed the Centre for Educational Research at Leeds Metropolitan University, contributing to initial teacher training (ITT) and continuing professional development (CPD) courses, and co-ordinating 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.

Dr 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 students' narrative of the experience of difficulties in literacy

acquisition.

Melanie Nind teaches on SEN issues with secondary PGCE students. Her primary research focus has been developing and evaluating 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 a broad experience in 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.

Jacqui Dean has led several funded research projects and currently co-directs the Nuffield Primary History Project.

Jon Tan specialises in evaluative education and policy research. He was principal researcher for the systematic review of literature on effective literacy teaching (funded by the UKRA) and has a continuing involvement with innovative literacy programmes. He is co-directing ESRC's Challenging Disaffection study.

Janet Collins' main interests are primary education and, in particular, developing pedagogic approaches for children who exhibit non-participatory behaviour in school. She has worked on some of the Open University's first foundation degree courses for teaching assistants working in primary education.

Conflicts of interest

There are no known conflicts of interest.

Acknowledgements

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This is the third year of this programme of reviews concerning children with special educational needs and the Advisory Group has remained constant during this period. The geographically diverse group has given feedback and helped to shape the review at each stage. The direction of this final year is a direct reflection of feedback from this group across the projects lifespan (see section 2.1.1) and the research question has been shaped by their comments. The primary method has been the circulation of emails and conferencing.

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 - 2004

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

ERIC 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)

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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*
 OR adolescent*
 OR law
 OR policy
 OR legislation
 OR regulation*
 OR health*
 OR bab*)

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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)
Record of electronic searching - 2005

ArticleFirst and ECO

Search strategy:

(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)

Number of hits: 33

Imported to EndNote, using ArticleFirst (OCLC) filter

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Australian Education Index (AEI)

Search strategy:

(Q-P-PY=('1994' OR '1995' OR '1996' OR '1997' OR '1998' OR '1998?' OR '1999' OR '1999?' OR '2000' OR '2001' OR '2001?' OR '2002' OR '2002?' OR '2003' OR '2004') AND (Q-P-ZZ=('MAINSTREAMING') OR Q-P-ZZ='MAINSTREAM' AND (Q-P-ZZ=('DISABILITIES') OR (Q-P-ZZ=('LEARNING DIFFICULTIES' OR 'LEARNING DISABILITIES')) OR (Q-P-ZZ=('SPECIAL NEEDS' OR 'SPECIAL NEEDS CHILDREN' OR 'SPECIAL NEEDS STUDENTS')))) NOT Q-W-00=((NURSERY OR EARLY CHILDHOOD OR KINDERGARTEN OR ADULT? OR PRESCHOOL OR UNIVERSIT? OR FURTHER EDUCATION OR HIGHER EDUCATION OR LAW OR REGULATION OR LEGISLATION))

Number of hits: 77 (255)

Imported into EndNote manually

British Educational Index

Search strategy:

(Q-P-PY=('1994' OR '1995' OR '1996' OR '1997' OR '1998' OR '1999' OR '2000' OR '2001' OR '2002' OR '2003' OR '2004') AND (Q-P-ZZ=('MAINSTREAMING') OR (Q-P-ZZ=('INCLUSIVE EDUCATION')) OR (Q-P-ZZ=('PUPILS WITH SPECIAL EDUCATIONAL NEEDS')) OR (Q-P-ZZ=('CHILDREN WITH SPECIAL EDUCATIONAL NEEDS')) OR (Q-P-ZZ=('SPECIAL EDUCATIONAL NEDS' OR 'SPECIAL EDUCATIONAL NEEDS')) AND (Q-P-ZZ=('MAINSTREAMING') OR (Q-P-ZZ=('INCLUSIVE EDUCATION')))) NOT Q-W-00=((POLICY OR UNIVERSITY OR EARLY YEARS OR EARLY CHILDHOOD OR HIGHER EDUCATION OR FURTHER EDUCATION OR PRESCHOOL OR LAW OR LEGISLATION))

Number of hits: 223 (501)

Imported to EndNote, using BEI (DIALOG@SITE) filter

ERIC

Search strategy:

(Q-P-PY=('2003' OR '2004') OR (Q-P-PY=('1994' OR '1995' OR '1996' OR '1997' OR '1998' OR '1999' OR '2000' OR '2001' OR '2002')) AND (Q-P-DT=('REPORTS--DESCRIPTIVE (141)' OR 'REPORTS--EVALUATIVE (142)' OR 'REPORTS--GENERAL (140)' OR 'REPORTS--RESEARCH (143)') OR (Q-P-DT=('DISSERTATIONS/THESES (040)' OR 'DISSERTATIONS/THESES--DOCTORAL DISSERTATIONS (' OR 'DISSERTATIONS/THESES--MASTERS DISSERTATIONS (0' OR 'DISSERTATIONS/THESES--PRACTICUM PAPERS (043)' OR 'ERIC DIGESTS IN FULL TEXT (073)' OR 'JOURNAL ARTICLES (080)')) AND (Q-P-ZZ=('MAINSTREAMING') OR (Q-P-ZZ=('INCLUSIVE EDUCATION' OR 'INCLUSIVE EDUCATION PROGRAMS' OR 'INCLUSIVE EDUCATIONAL PROGRAMS' OR 'INCLUSIVE SCHOOLS') OR (Q-P-ZZ=('CLASS INCLUSION')) OR (Q-P-ZZ=('INCLUSION' OR 'INCLUSION (EDUCATION)')))) AND (Q-P-ZZ=('DISABILITIES') OR (Q-P-ZZ=('LEARNING DISABILITIES')) OR (Q-P-ZZ=('SPECIAL NEEDS CHILDREN' OR 'SPECIAL NEEDS STUDENTS')))) NOT Q-W-00=((EARLY CHILDHOOD OR HIGHER EDUCATION OR POLICY OR PRESCHOOL OR ADULT? OR ADOLESCENT? OR LEGISLATION))

Number of hits: 839 (1,309)

Imported to EndNote, using ERIC (DIALOG@SITE) filter

Dissertation abstracts

Search strategy:

KEY(mainstreaming or inclusive education or inclusive school*) and KEY(curriculum or teaching practice* or teaching method*) and DATE(>=2003) and DATE(<=2004) NOT KEY(policy or law or regulation* legislation)

Number of hits: 7

Imported to EndNote, using uq dissertation abstracts pq filter

Internet Google scholar

Search strategy:

‘inclusive school’ and curriculum

Number of hits: 18

Imported to EndNote

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 (<http://www.nasen.org.uk/>)

International Special Education Congress (<http://www.isec.org.uk/>)

Down Syndrome Organisation (<http://www.downs-syndrome.org.uk/>)

Mencap (<http://www.mencap.org.uk/>)

APPENDIX 2.4 EPPI-Centre keyword sheet, including review-specific keywords

V0.9.7 Bibliographic details and/or unique identifier

A1. Identification of report Citation Contact Handsearch Unknown Electronic database (please specify)	A7. 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 Physical education Religious education Science Vocational Other (please specify)	A10. Age of learners (years) 0-4 5-10 11-16 17-20 21 and over	A11. Sex of learners Female only Male only Mixed sex	A12. 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)	A13. Which type(s) of study does this report describe? A. Description B. Exploration of relationships C. Evaluation a. naturally-occurring b. researcher-manipulated D. Development of methodology E. Review a. Systematic review b. Other review
A2. Status Published In press Unpublished	A8. Programme name (please specify)				
A3. Linked reports <i>Is this report linked to one or more other reports in such a way that they also report the same study?</i> Not linked Linked (please provide bibliographical details and/or unique identifier)	A9. 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)				
A4. Language (please specify)	A5. In which country/countries was the study carried out? (please specify)				
A6. 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 (please specify)					

RS1. What is the aim of the teaching approach? (Tick *all* that apply.)

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

RS2. 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.)

RS3. 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

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

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

RS5. What are the outcomes? (Tick *all* that apply.)

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

RS6. Who judges the outcomes? (Tick *all* that apply.)

Researcher
Teacher
Pupil
Parent
Support staff
Other

RS7. What form of interaction is evidenced? (Tick *all* that apply.)

Verbal
Visual
Auditory
Tactile
Signed
Written
Technological
Pictorial
Other

RS8. Who is involved in the interaction? (Tick *all* that apply.)

Pupil - Pupil
Pupil - Teacher - Support staff
Pupil - Support staff
Teacher - Support staff
Pupil - Teacher
Other

RS9. What type of interaction is evidenced? (Tick *all* that apply)

Informal interaction
Considered interaction
Programmed interaction

Appendix 3.1: Studies not obtained

Bulgren JA, Deshler DD, Schumaker JB (1997) Use of a recall enhancement routine and strategies in inclusive secondary classes. *Learning Disabilities Research and Practice* 12: 198-208.

Collins JL, Godinho GV (1996) Help for struggling writers: strategic instruction and social identity formation in high school. *Learning Disabilities Research and Practice* 11: 177-182.

Dalton B, Tivnan T, Riley MK, Rawson P, Dias D (1995) Revealing competence: fourth-grade students with and without learning disabilities show what they know on paper-and-pencil and hands-on performance assessments. *Learning Disabilities Research and Practice* 10: 198-214.

Graham SH, Karen R, Loynachan C (1996) Can a strategy be taught and learned in secondary inclusive classrooms? *Learning Disabilities Research and Practice* 11: 41-57.

Harris CA, Miller SP, Mercer CD (1995) Teaching initial multiplication skills to students with disabilities in general education classrooms. *Learning Disabilities Research and Practice* 10: 180-195.

Klingner JK, Vaughn S, Hughes MT, Schumm JS, Elbaum BE (1998) Outcomes for students with and without learning disabilities in inclusive classrooms. *Learning Disabilities Research and Practice* 13: 153-161.

Lancaster J (2005) Is it really possible? Can students with learning difficulties ever achieve higher levels of self-efficacy? *Special Education Perspectives* 14: 46-61.

Pressley M (1995) The comprehensive instruction that students need: instruction fostering constructively responsive reading. *Learning Disabilities Research and Practice* 10: 215-224.

The results of this systematic review are available in three formats:

SUMMARY

Explains the purpose of the review and the main messages from the research evidence

**TECHNICAL
REPORT**

Includes the background, main findings, and full technical details of the review

DATABASES

Access to codings describing each research study included in the review

These can be downloaded or accessed at
<http://eppi.ioe.ac.uk/cms/Default.aspx?tabid=2429&language=en-US>

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