TECHNICAL REPORT

Special educational needs (SEN)

A systematic review of interactions in pedagogical approaches with reported outcomes for the academic and social inclusion of pupils with special educational needs

Review conducted by the Special Educational Need (SEN) Review Group

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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/reel/**

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CONTENTS

Glossary

ADHD	Attention deficit hyperactivity disorder
AI	Anchored instruction
CPD	Continuing professional development
GisML	Guided inquiry supporting multiple literacies
IDC	In-depth criterion
ITE	Initial teacher education
LEA	Local education authority
SEN	Special educational needs
SENDA	Special Educational Needs and Disability Act 2001
TDA	Training and Development Agency for Schools
WoE	Weight of evidence

Summary

Background

The growing demand for inclusive practices within mainstream schools has resulted in classroom teachers having to take direct responsibility for the individual learning needs of all pupils within the setting, and reduced the expectation that support staff should be the primary practitioners for children with special educational needs (SEN). The belief in a need for special pedagogical approaches for these children has also been widely critiqued (e.g. Norwich and Lewis, 2001; Hart, 1996) and there has been a growing focus upon the teaching practices that can be, and are, more broadly used by mainstream practitioners. Central to all these approaches are the interactions that both create the learning context and operate within it.

Since *The Warnock Report* (DES, 1978), there has been increasing emphasis in England and Wales on the importance of including pupils with SEN in mainstream settings. The Special Educational Needs and Disability Act 2001 (SENDA) changed the legal rights of young people with disabilities and their parents, extending disability anti-discrimination legislation to schools. To overcome the opportunity for uncertainty in providing support appropriate to children with special educational needs, there is a Special Educational Needs Code of Practice (DENI, 1996; DfES, 2001; National Assembly Wales, 2004), which gives guidance to local education authorities (LEAs), governing bodies and schools. In addition, *The National Curriculum Inclusion Statement* (DfEE/QCA, 1999), to which all teachers in England 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, requiring them to provide suitable learning challenges, to respond to pupils' diverse learning needs, and to overcome potential barriers to learning and assessment for individuals and groups of learners. A recent OFSTED report (2004) found, however, that many schools still do not see themselves as having the skills, experience or resources to provide effectively for children with special educational needs. This is despite evidence that increasing numbers of children with SEN are making good progress.

This review follows on from the first review in 2004 (Nind et al., 2004) which sought to identify how pedagogical approaches can effectively include children with SEN in mainstream classrooms. The 2004 review 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. In addition to the 2004 review, there have been reviews that were technically non-systematic, which sought to establish the effectiveness of particular pedagogies (Norwich and Lewis, 2001) or looked at approaches beyond classroom pedagogy (Sebba and Sachdev, 1997), and a number of systematic reviews that have considered the impact of broader school actions on pupil participation (Dyson et al., 2002; Harden et al., 2003; Howes et al., 2003). It has been noted elsewhere (Skidmore, 2004) that there is a need to explore more fully the individual interactions within the classroom in relation to effective inclusion.

Aims

This is the second year of a three-year project that is focusing upon effective pedagogical approaches in use in mainstream classrooms with children with

special educational needs, aged 7–14 years. This second review expands the focus of the previous year to investigate the nature of the interactions between teachers, support staff and pupils.

Review questions

Our overall review question for the three-year project is:

> *Q1 What pedagogical approaches can effectively include children with special educational needs in mainstream classrooms?*

Our in-depth review in the second year focuses on the more specific question:

> *Q2 What is the nature of the interactions in pedagogical approaches with reported outcomes for the academic and social inclusion of pupils with special educational needs?*

Methods

In the first and second years of this review the overall question (Q1) was identified by the Review Group and agreed with the Advisory Groups. Q1 was the guiding question in both years for the subsequent electronic search of databases. This electronic search was carried out using a variety of keyword terms, drawn from the educational terminology of different countries, and from the British Education Thesaurus. All studies identified through these searches were imported into EndNote bibliographic software, and then into the EPPI-Centre systems. The same keywords and databases were used in both the first and second reviews.

In both the first review and this review, the citations were screened by two independent screeners, with a sample being evaluated by the EPPI-Centre link-person for quality assurance. The citations were initially screened on the basis of their titles and abstracts. This screening involved the application of eight agreed inclusion / exclusion criteria, which defined the subsequent scope of the review. To be included, the studies had to focus on pupils aged 7–14, with special educational needs, in mainstream classrooms. They had to include pedagogical approaches, offer an indication 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. A range of electronic databases and citation indexes were searched as well as a variety of internet sites. Following the screening process, copies of papers were sought and given a second more detailed reading, where again the inclusion/exclusion criteria were applied. In the current review, this second screening included the reading of papers that had not arrived in time for the cut-off date for the first review. The equivalent cut-off date for document retrieval for the second year was 31 March 2005. This second reading also involved two independent screeners, with quality assurance provided by the EPPI-Centre link person.

The papers that passed through this screening process were now keyworded using two sets of keywords. The first set used the EPPI-Centre (2002a) *Core Keywording Strategy for education (Version 0.9.7)*, while the second set used a review-specific strategy designed by the research team. This second keywording strategy was initially designed in 2004 for the first review, but was updated and expanded in this review. This keywording was applied by pairs of reviewers, working independently and then moderating their findings. The process was once more sampled for quality-assurance purposes by the EPPI-Centre link person. This keywording process created a 'descriptive map' of the studies. This map offers an overview of the studies and the research within them, giving details of their aims, methodologies, interventions, theoretical orientation, outcomes, and so on. The keywording process did not assess the quality of the studies.

The full Review Group now had detailed discussions about the priorities for the in-depth focus in this review. Drawing on identified needs of users, it was decided that a priority should be interactions that involved unsupported mainstream classroom teachers, and that these studies should focus on teaching and learning with outcomes for the academic achievement and social inclusion of pupils with SEN, as these are priorities both for individual teachers and the schooling system as a whole. It was also decided that we would not focus on programmatic interactions nor 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 inclusion and exclusion criteria, and applied to the studies in the descriptive map so as to produce the relevant studies for the in-depth review.

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 for education and review-specific guidelines created by the Review Group, and any differences between the two reviewers were discussed and resolved. A central component of the two sets of data-extraction guidelines was the assessment of the quality of studies and weight of evidence (WoE)

supplied by their findings. Within the EPPI-Centre systematic review process, this is a key component in identifying the reliability and quality of each study, the trustworthiness of study results, and the weight of evidence that the study could contribute to answering the in-depth review questions. The reviewers assessed the relative WoE in relation to: the soundness of studies (internal methodological coherence, WoE A); the appropriateness of the research design and analysis in relation to the review questions (WoE B); and the relevance of the study topic focus to the review questions (WoE C). An overall weight of evidence valuation was arrived at through the combination of weightings identified in relation to the quality of execution, appropriateness of design and relevance of focus (WoE D).

The assessments of the reviewers were now used by the main authors to frame the synthesis of the studies, and the subsequent conclusions and recommendations. An evaluation of the quantitative and qualitative components of the studies was undertaken, identifying central themes and findings across the studies, so that a structured narrative could be created which presented key aspects of interactions in effective pedagogical approaches.

Results

Across the two years, 3,324 papers were identified for potential inclusion. Having excluded duplicates, 2,812 were initially screened on the basis of their titles and abstracts or by hand, and 2,224 were excluded for not meeting the inclusion / exclusion criteria of the review. Of these the most common reasons for exclusion were not being empirical studies (30%), not being concerned with pedagogical approaches (29%), and not indicating pupil outcomes (22%). This meant that 587 papers were sought in 2004–2005 to have the inclusion / exclusion criteria applied during a more detailed reading. 70 papers were not obtained by the cut-off date. 517 full documents were screened, with 405 papers excluded. In the application of exclusion / inclusion criteria to the collection of titles and abstracts, the measure of inter-rater reliability between the two members of the Review Group was good in both years (Cohen's Kappa 2004: 0.62; 2005: 0.65). Again the three most common criteria for exclusion were the categories identified above. Four studies were also found to be reported in two papers. The systematic map therefore included 109 studies (68 from 2004 and 31 from 2005).

91% of the studies were identified through electronic databases, 83% came from the USA and 9% of the studies came from the UK. Over 90% of the studies were either evaluations or explorations of relationships, and over 80% focused upon Teaching and Learning. 55% of the studies claimed an impact upon academic attainment and 44% upon social interaction/involvement. Only 31 studies (28%) focused upon the regular teacher working on their own in classroom, yet the majority of studies gave some evidence about pupil-teacher interactions (83%) and far less about the interactions involving support staff (for example, pupils-support staff interactions: 18%). The majority of these interactions were informal (72%) and considered (68%), with the minority being to some degree programmed in nature (26%). Particularly noticeable too was the emphasis upon verbal (84%) and written (64%) interactions, in comparison to other forms, particularly tactile (15%) and signed (1%) interactions.

Seven studies met the criteria for inclusion and were included in the in-depth review. They cover a range of settings, subject areas and research types. Five of the studies are from the USA and one each from Canada and Australia. The studies are equally divided between primary and secondary phases of education, and while three were conducted within science classes, two do not have a specific curricular focus, one draws upon a general curriculum, and the other upon literacy. There was a broad mix of special educational needs focused upon within the studies, including those with learning impairments, physical impairments, sensory impairments, and emotional and behavioural difficulties. Four of the studies have verbal interactions to the fore, with written, technological and auditory interactions being considered in the other papers. Five studies evaluated settings without researcher-manipulation (N=2) or with researcher-manipulation (N=3) and two studies primarily explored the relationships between variables within the setting.

Synthesis of these studies lead to the following four major themes emerging:

- interaction and the mediating role of the teacher
- interaction, cognitive level and engagement
- interaction and the learner's voice
- interaction and knowledge as contextually-grounded

Weight of evidence (WoE)

None of the seven studies was allocated a high WoE in relation to its trustworthiness in answering its own study question (WoE A);, five received a medium rating; and two were allocated a

low rating. In relation to the specific question of the systematic review, we considered the appropriateness of each study's research design and analysis (WoE B), and also considered its relevance (WoE C). Two papers (Palincsar et al., 2001; Wallace et al., 2002) were deemed to be of high trustworthiness in relation to WoE B and C; two further studies (Jordan and Stanovich, 2001; Rieth et al., 2003) were allocated a medium rating on both these criteria; another (Tindal and Nolet, 1996) obtained a medium rating for WoE B but a low for WoE C, while the two remaining studies (Ward and Center, 1999; Zembylas and Isenbarger, 2002) scored low on both criteria. In terms of overall weight of evidence (WoE D) a majority of studies (5) were deemed to be medium in trustworthiness and a minority (2) were deemed low.

Synthesis

In synthesising our findings, our conclusions reflect the WoE which we can apply to the studies. A common theme across all the studies is the powerful role the teacher plays in shaping interactions and influencing learning opportunities through interactions. Six of the studies observed teacher interactions while the one remaining study audio-recorded classroom interactions involving a direct focus on teachers' interactions. It is evident that positive teacher attitudes towards the inclusion of children with special educational needs are reflected in the quality of their interactional patterns with all pupils and, in turn, to their pupils' self-concept. 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.

Those interactions that are demonstrated to be more successful in terms of academic and social outcomes are characterised by questions and statements involving higher order thinking, reasoning, and implicating a point of view. The teachers who enable pupils to achieve these outcomes were those who spent most of the available time in these high-quality, on-task interactions as opposed to the low-quality off-task interactions. High-quality interactions are those in which teachers offer learners the opportunity to problem-solve, to discuss and describe their ideas, and to make connections with their own experiences and prior understandings, while those teacher interactions that are less successful focus on procedural matters, behaviours and general classroom management.

The theme of the learner's voice emerges explicitly from five of the seven studies in the in-depth review. Pupils with special educational needs participated more fully when encouraged to identify their thoughts and assisted to document them, particularly through one-to-one discussion with the teacher. The importance of the teacher eliciting prior knowledge and understanding was also evident, and, in two studies, it was noted that this enquiry had resulted in teachers being impressed by the thinking and conceptual understanding of pupils with special educational needs. Successful interactions were also recognised as those in which the teacher calibrated questions and answers to the pupils' responses, following the pupils' thinking rather than just checking that their understanding equated with that of the teacher.

The importance of interactions being based in learners' experiences is a theme emerging from three studies. Drawing upon this contextually-grounded knowledge builds connections to the authenticity of activities and the perception that they are meaningful to learners in the here and now of their lives. These interactions involve direct experiences and realistic problems, offering multiple opportunities to engage with the learning situation and others within it. The high level of higher order thinking in these approaches suggests that contextualising what is to be learned in the form of inquiring into tangible problems has potential to foster academic and social inclusion of pupils with SEN.

Strengths and limitations

This systematic literature review had both strengths and limitations. The literature review was limited in scope to material from 1994 and to pupils aged between 7 and 14, but it drew on evidence from a full range of pupils and settings in this age group. It included studies that represented a broad range of SEN, and offered a reasonable range of curricula foci. It also drew upon studies of varying size, from a case-study of one child to a study of 118 classrooms, although the number of studies was small. The review benefited from high-quality assurance, with screening, data-extraction and quality-assessment being conducted by two independent review team members (or a Review Group member and EPPI-Centre link person) at each stage. The quality of the studies within the review and the rigorous check on quality further strengthens confidence in the review findings.

The number of studies that did not arrive in time (70 out of a possible 587, 12%) is a potential

limitation of the review, as is the comparative lack of studies that presented negative or null outcomes. There is also a total lack of studies originating in the UK, which limits certainty about the context and cultural equivalence of studies, and therefore the generalisability of findings, although all studies were conducted in English language settings. Although the majority of studies were allocated a medium weight of evidence rating overall (WoE D), the absence of studies with a high rating overall is another limiting factor that must be taken into account.

Implications

Researchers, policy-makers and practitioners should be aware that there is a shortage of evidence about the nature of teaching approaches that effectively include children with SEN in mainstream classrooms. In addition there is a shortage of evidence about teachers working alone within inclusive settings, and about their interactions with pupils, particularly in relation to interactions involving tactile and signed modes of communication.

There is evidence, however, particularly in relation to oral interactions, that teachers are more likely to be effective with all pupils if they use language to draw out pupils' understanding, and encourage further questioning and links between new and prior knowledge. These interactions are more likely to be effective if they are situated within activities that are hands-on, personally relevant and offer a range of opportunities to engage with the concepts, and with others' understandings of those concepts.

Given the complexities of working within inclusive settings, teachers in training need opportunities to reflect on their practices in the light of the existing research base. The findings of this review underline the importance of this in particular, since it strongly supports the notion that teachers who see the inclusion of pupils with SEN as part of their role are more likely to have effective, high-quality, ontask interactions, and less likely to focus on relatively ineffective organisational and behavioural matters when talking to pupils.

CHAPTER ONE

Background

This chapter identifies the rationale and aims of this review, as well as a number of definitional and conceptual issues. It describes the policy and practice context and considers previous reviews within the field. It gives a background to the authors and funders, and the different users for whom it is intended. It concludes with review questions.

1.1 Aims and rationale for the current review

This review represents the second year of a progressive and developing review programme that has been designed to span a three-year period and utilize the expertise of the research team in relation to the 'Statement for inclusion'. The first review carried out by the same authors (Nind et al., 2004) identified and described studies that had investigated pedagogical approaches that could 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 the 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 in this series expanded the focus of the previous year to investigate the nature of the interactions between teachers, support staff and pupils. It was felt that there was a particular need to explore more fully the individual interactions between teachers and pupils through which learning occurs as there is a tendency to neglect this aspect of pedagogy in relation to effective inclusion (Skidmore, 2004).

The relevance of such a review to teachers in the mainstream and new entrants to the profession was highlighted an Ofsted report (2004) which found that many schools still did not see themselves as having the skills, experience or resources to effectively provide for children with SEN. This is despite evidence that an increasing number of children with SEN are making good progress. The importance of providing a sound evidence-base of effective practice is central to overcoming teacher uncertainty and expanding successful inclusion.

The aims of the review are as follows:

- To update the descriptive map of research (completed in the first review) of studies undertaken in the area of effective pedagogical approaches that enable children with SEN 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 interactions of teachers, support staff and pupils within pedagogical approaches 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). The term has come to be used in ways not originally intended, however. 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 (for example, 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 our understanding of how we effectively include pupils. 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.

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 *Code of Practice on the Identification and Assessment of SENs* (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 National Curriculum Inclusion Statement (DfEE/QCA, 1999) 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 SEN 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 pupils in the cultures, curricula and communities of schools (Dyson et al., 2002)

These reviews 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 SEN or each type of special educational need, 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 has 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 this team's review (Nind et al., 2004) that could answer the question of what pedagogical approaches can effectively include children with

SEN in mainstream classrooms. The first review 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 interactions of members of this learning community are core to this process and therefore form the basis of the current in-depth study. Of significance to the current review is the 14% of papers that were not received within the timeframe of the first review or were unavailable. This review seeks to incorporate these studies which were not included in the first review.

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 for Schools (TDA) 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 TDA and the research team, training core team members and assuring the quality of the systematic research process. Funding of the review by the TDA 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), and training and practice in systematic review procedures. It also included a qualified librarian experienced in searching electronic databases and setting up data storage and retrieval systems. Members of the Review Group had previously co-researched and co-authored on several research projects, including systematic reviews. The Review Group's involvement with initial and continuing teacher education means that it is well placed to address the implications of the review on raising standards and on the quality of teacher education, and to build the capacity of teacher educators to carry out further reviews. (Further details are available in 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 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:

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

In deciding upon this question, we seek answers to important subsidiary questions:

- What kinds of classroom practice 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?

The first year's review scrutinised and appraised research studies in the light of these questions. In the second year, we updated the systematic literature search and endeavoured to access those papers that had been unavailable for inclusion in the first year review. For this specific review, however, we focus on a subset of papers identified in the systematic map of the first review to answer the question:

> *What is the nature of the interactions in pedagogical approaches with reported outcomes for the academic achievement and social inclusion of pupils with special educational needs?*

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 we defined our terms and how we narrowed our focus. 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. It then describes how we progressed from a mapping of the studies to an in-depth review. An account is offered of how we assessed the quality of studies, how we conducted a synthesis of the evidence, and how the quality-assurance mechanisms were applied. As this is the second year of the review, we have already gathered and evaluated a number of papers in year one that also pertain to this second year.

2.1 User involvement

2.1.1 Approach and rationale

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

The Advisory Group includes teacher trainers, teachers, educational psychologists, advisers and government inspectors – all of whom have a special interest in the area of SEN 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) advised both on research in their contexts and issues for users in other contexts.

2.1.2 Methods used

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

2.2 Identifying and describing studies

2.2.1 Defining relevant studies: inclusion and exclusion criteria

This first part of the research process is to map out the research studies that have been undertaken in the topic. This was initially carried out in 2004 as part of the first review. The same approach was carried out in 2005 to update the systematic map in the first review, so as to identify those studies that have been published in the intervening months, or which have subsequently become available.

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

Scope

1. Include a focus on pupils who experience special educational needs of some kind (as defined below)
2. Be conducted in mainstream classrooms
3. Include pedagogical approaches
4. Include an indication of pupil outcomes
5. Be concerned with the 7–14 age range or some part of it

Study type

6. Be empirical and exploration of relationships, evaluations or systematic reviews

Time and place

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

These criteria were based upon the understanding of the following key terms:

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).

The term *outcomes* is used to mean an impact upon aspects of the learning and participation of children with special educational needs: for example, their attainment levels, progress, attitude, confidence and/or skills. This review focused closely upon the criteria used in the studies and the extent to which they had been made explicit. For some, outcomes were identified through tangible pupil achievements. Others identified outcomes through the ratings of teachers, teaching assistants, parents and the pupils themselves. It was anticipated that outcomes could be catagorised under three headings: academic attainment, social interaction/involvement or behaviour.

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. We see this as an educational and, not medical, concept, with inherent fluidity and contingency. In this context, the term is used to categorise pupils for whom there may have been seen 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. 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, and this may be explored in the later years, this was not included in the initial literature review reported here.

The particular contexts examined in the review 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.

We focused on those studies that have been published since 1994 as this marked the global commitment to inclusion in the Salamanca agreement (UNESCO, 1994) together with a focus on practical responses to SEN in mainstream classrooms in England and Wales (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 Development Agency with its concern with effective practice for children with SEN.

We 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 studies would often involve case studies of a single classroom or school, sometimes as part of bigger projects.

For full details of inclusion and exclusion criteria, see Appendix 2.1.

2.2.2 Identification of potential studies: search strategy

The following electronic databases and citation indexes were interrogated:

- 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. Our 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; and '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 (see Appendix 2.2):

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

2.2.3 Screening studies: applying inclusion and exclusion criteria

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 citations 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 reviewers met to moderate their findings, and re-examined those abstracts about which they did not agree. 10% of the citations 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 onto 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 onto 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 (2002a) *Core Keywording Strategy (Version 0.9.7)* and review-specific keywords (see Appendix 2.4). Keyworded studies were added to the existing map created for the first review. This helped to build the 'descriptive map' of the studies in our review and provided a full and clear picture of the kinds of research that have been conducted together with details of their aims, methodologies, interventions, theoretical orientation, outcomes, and so on. This process does not assess the quality of the studies.

The review-specific keywords were initially designed in 2004 for the first review, but updated and expanded in 2005. In particular, it was felt necessary to provide more detailed descriptions of categories that were being used by the team, as there had initially been some contradictory interpretations in 2004. In the previous year, for example, we had felt that we had a common view of terms such as:

- raise academic attainment

- enhance social interaction/involvement
- improve behaviour

However, when the keywording was analysed, it became clear that there were a number of different interpretations that meant that papers had to be revisited and keywords reassessed. We therefore had a full team debate about the operationalisation of the keywording.

As a team, we also recognised that, given the focus of the current review, we had to identify the nature of the interactions within the studies. To this end, three additional review-specific keyword questions were added to the second database. These questions looked at the types of interaction evidenced in the studies, at the people involved in the interactions, and the form of the interactions. Based on the previous year's uncertainty about some keyword definitions, it was felt particularly important to define our meanings when referring to types and forms of interaction.

We identified the following types of interaction:

- Verbal (mainly dialogue or conversation between participants)
- Auditory (mainly listening to a stimulus or one person talking)
- Visual (for example, body language, gesture, colour, light)
- Pictorial (for example, images, pictures, graphs, visual timetables, symbols, posters)
- Signed (use of sign languages, such as BSL, Makaton, Signalong)
- Written (for example, print materials, printed texts, handouts)
- Tactile (for example, feeling objects, physical contact, physical activity)
- Technological (involving ICT, including computers, TV, DVD)
- Other (for example, smell, taste)

We identified the following forms of interaction:

- *Informal interaction:* The interactions in the intervention occur spontaneously in the classroom or incidentally, or as a largely un-reflected upon or unplanned part of the teaching and learning.
- *Considered interaction:* The interactions in the intervention are reflected upon as a considered and important part of the teaching and learning.
- *Programmed interaction:* The interactions in the intervention are directly taught or programmed using the principles of operant conditioning (e.g. pupils taught to reward each other, teachers using measured responses to reinforce pupil attention).

2.2.5 Identifying and describing studies: quality-assurance process

Our review used the systematic review procedures as described in the EPPI-Centre documentation to ensure that our review was systematically conducted.

Screening

Screening of both titles and abstracts, and full text documents was conducted by two independent screeners. A random sample of 20 titles and abstracts, and 10 full papers was also screened in 2004 along with the 10% assessed in 2005 by the EPPI-Centre link person.

The screeners met to moderate their findings, and re-examined those abstracts about which they did not agree. 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 the screeners excluded the title for a different criterion, the criterion lower down the hierarchy was generally found to be an appropriate basis for exclusion, and so this was the criterion used. If there was a lack of information or if disagreement still existed after discussion, then the paper was included for more detailed analysis.

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. Each study was then keyworded by two members of the Review Group, working first independently and then comparing their decisions and coming to a consensus. Three teams of two keyworders conducted this process. In the first year, more novice Review Group members were paired with experienced or trained keyworders/reviewers. A

random sample of 10 studies was keyworded by the EPPI-Centre link person.

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 first review, it became clear to the Review Group that there was a large number of studies in the field, and that it would not be possible to review in depth all 68 studies found. In a meeting of the Review Group, it was agreed that our original research question should be refined to focus on more specific themes within it. The broad range of studies identified meant that, in the second year, it was appropriate to focus on additional significant themes. Not to do so would mean that our original research question was only partially answered through the particular focus addressed in the first in-depth review. In addition, by revisiting the same studies, we had another opportunity to access those studies that were unavailable in the first, and any others which had subsequently been published or otherwise become available.

The Review Group identified the question for the second in-depth review (What is the nature of the interactions in pedagogical approaches with reported outcomes for the academic achievement and social inclusion of pupils with special educational needs?), since collaboration and co-operation were widely seen to be central to the inclusion of pupils with special educational needs within the mainstream. The previous year's review had confirmed this view. It was felt that classroom interactions are key to successful academic and social engagement, and particularly relevant to our audience when examining their practice and working relationships. In addition, it was felt that the question as posed provided a clear, defined perspective on pedagogy without being linked to a single pedagogical approach.

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

- had a focus on teaching and learning
- had a focus on outcomes for the academic achievement and social inclusion of pupils with special educational needs
- were focused on mainstream classroom teachers
- were exploration of relationships or were evaluations

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

- did not have a focus on teaching and learning
- did not have a focus on outcomes for the academic achievement and social inclusion of pupils with SEN
- had a focus on a collaborative teaching approach
- had a focus on programmatic interactions
- were not exploration of relationships or evaluations

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). 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 section 2.3.2.

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. Our 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 us to focus on the aims and rationale of each individual study, its research question(s) and its methods and design. In addition, we used a set of review-specific questions designed by the research team.

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.

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

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 for Extracting Data and Quality Assessing Primary Studies in Educational Research (Version 0.9.7)* (EPPI-Centre, 2002b) and software assisted our investigation of the reliability and quality of each study meeting the inclusion criteria by focusing our judgements about the trustworthiness of study results and the weight of evidence that the study could contribute to answering the review question.

Judgements about the relative weight of evidence (WoE) of each study was made using the following explicit criteria:

A: Soundness of studies in answering the studies' 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

2.3.4 Synthesis of evidence

Our synthesis attempted to bring together the findings of the individual in-depth studies so as to enable the drawing of tentative conclusions and recommendations. It has been agreed that, for our audience and purpose, the most appropriate synthesis would take the form of a structured narrative describing any overall, cross-study patterns/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, 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.

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.

Data-extraction

For 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. When the independent in-depth analysis of the studies was completed, each internal pair of reviewers met to isolate and resolve any differences of opinion and interpretation.

CHAPTER THREE

Identification and description of studies: results

In this chapter, we describe the ways in which we searched for studies, identified those studies which we would keyword, and narrowed these down for the systematic map. We 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 second year of the review process, we were building upon the methods and data that had been established in the first review. The data that we present here represents the outcomes of this two-year process.

3.1 Studies included from searching and screening

Figures 3.1, 3.2 and 3.3 summarise the filtering of papers from searching through systematic map to final synthesis. In the second review, we followed the same methods, definitions and criteria as in the first review, so that we could draw upon papers from both years within the synthesis. Figure 3.1 shows the process in 2004 up until the point at which the systematic map for the first review was created. These studies then feed into the second systematic map. Figure 3.2 shows the process in 2005 up until the point at which the systematic map was created. Figure 3.3 shows the combined processes from the first and second reviews up to the final synthesis.

Key to Figures 3.1, 3.2, 3.3

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

Figure 3.1: Filtering of papers from searching to map to synthesis (2004)

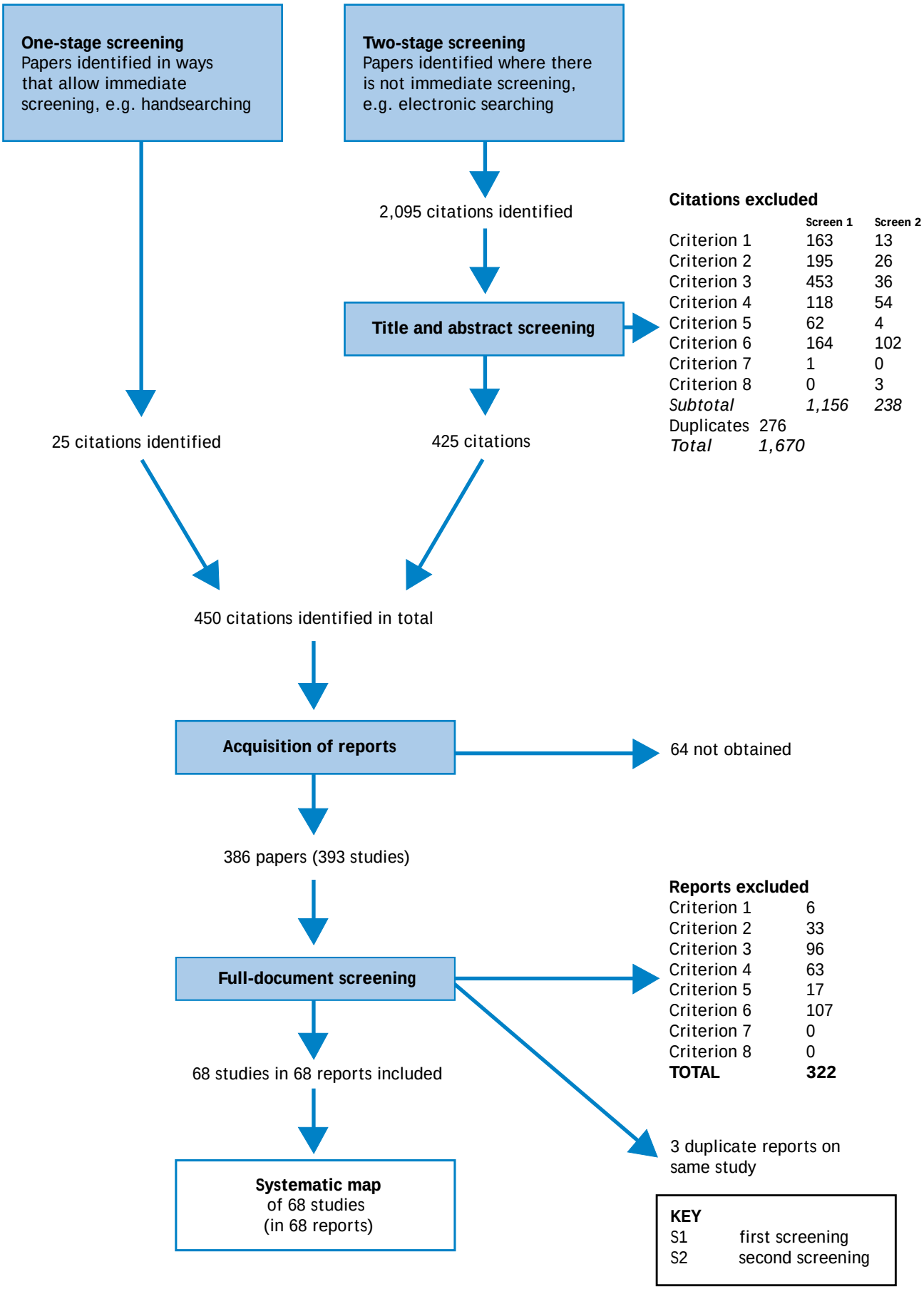


Figure 3.2: Filtering of papers from searching to map (2005)

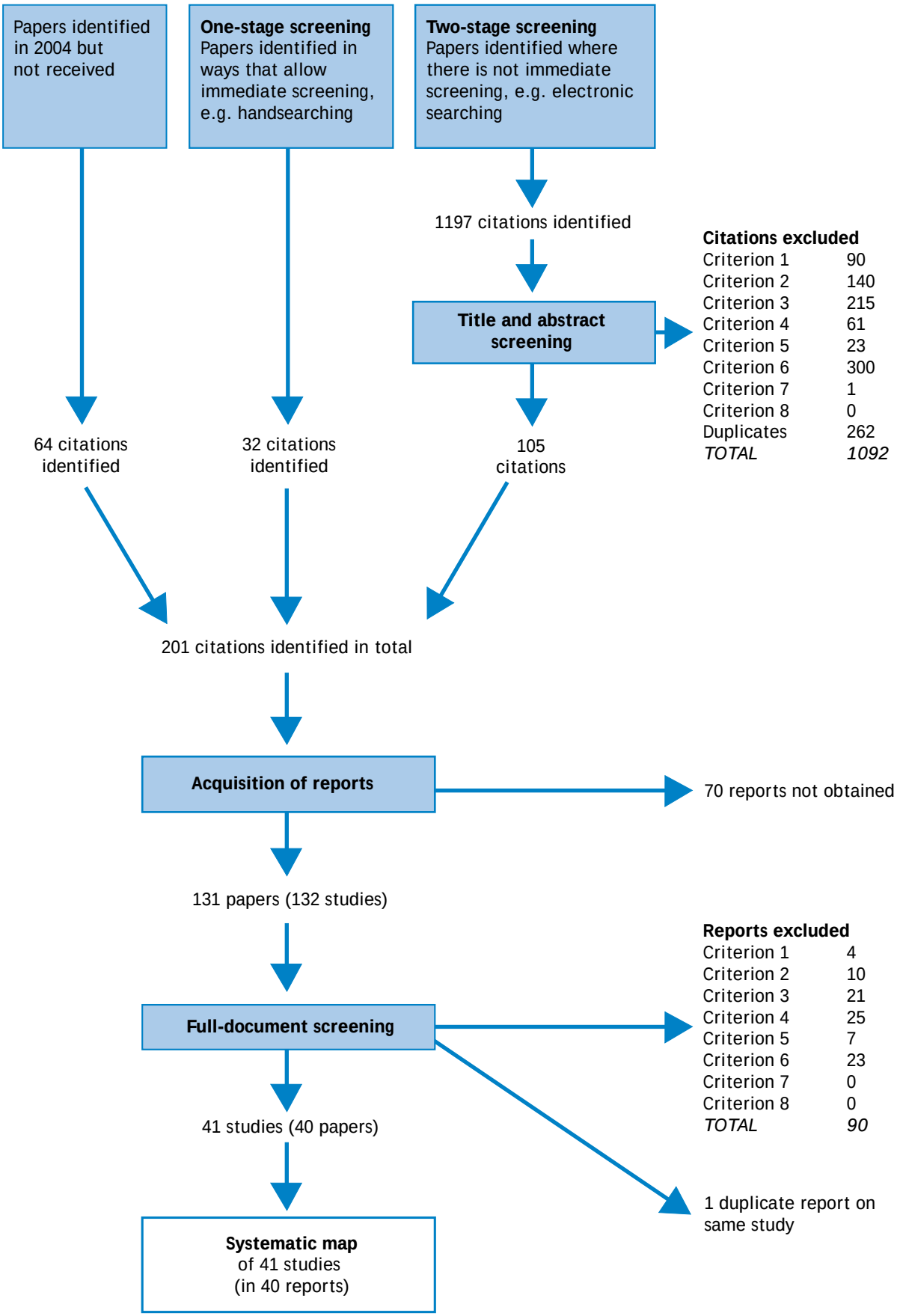


Figure 3.3: Filtering of papers from searching to map to synthesis (2004 and 2005 together)

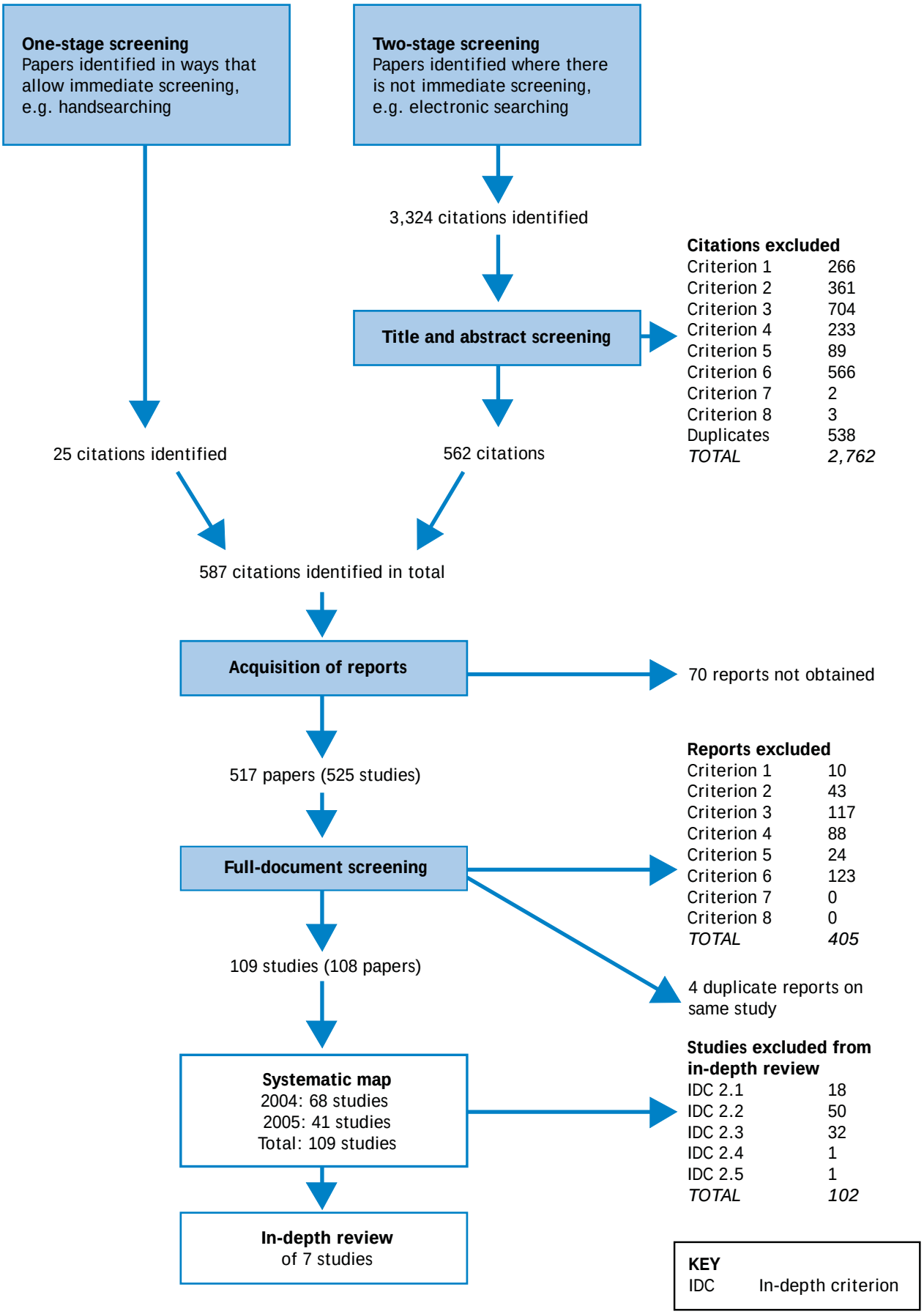


Table 3.1 Database sources of titles (represented as percentages)

	% in 2004 (N = 2,095)	% in 2005 (N = 1,197)	Total % (N = 3,292)
Article First	4.71	2.76	4.05
Australian Education Index	8.56	6.43	7.84
British Education Index	9.67	18.63	12.71
Child Data	22.85	0.00	15.11
Dissertation Abstracts	1.50	0.58	1.19
ECO	4.15	0.00	2.74
Educational Research Abstracts	0.17	0.00	0.11
ERIC	21.65	70.09	38.06
Education Online	0.21	0.00	0.14
Index to Theses	0.09	0.00	0.06
Psychinfo	11.81	0.00	7.81
ISI web of science	6.89	0.00	4.56
Socsitation	0.21	0.00	0.14
Paper First	4.15	0.00	2.74
Internet	3.38	0.00	2.24
Google Scholar	0.00	1.50	0.51

The databases were searched using the keywords identified in Appendix 2.2. The same keywords were used in both first and second reviews. The same databases were searched too, but the creation of Google Scholar within the 2005 search period meant that this database was included, despite its absence in the previous year.

The database origins of papers identified for screening (including duplicates) are shown in Table 3.1 and Figure 3.4. 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 number of papers from right across the period relevant to this review, 1994–2005. The far smaller contribution made by the other databases in the second review's search demonstrates that there have been few papers added to the databases in the past year. This is not, however, the same as saying few studies have been carried out. It is possible that there are studies still to be added to the databases, as was the case with ERIC in 2004.

The bibliographic data from our searches was imported into our first database (EndNote 1); duplicate papers were then identified and excluded. In 2004, 276 duplicates were identified; 262 duplicates were identified in 2005. The figures for 2005 do not include the papers used in the review for 2004. As the same inclusion/exclusion criteria were being used across the two years, those papers identified as suitable for exclusion in the 2004 review were automatically excluded from the 2005 review. Duplicates were identified by EndNote, or by hand.

The inclusion/exclusion criteria (see Appendix 2.1) were then applied to the titles and abstracts. In the first review, this initially produced a high number of included studies, as the independent reviewers included any paper that just one of them had scored 'include'. On the advice of the EPPI-Centre, the titles and abstracts were re-examined, applying the criteria more rigorously and using additional information which was sought where it was missing. During the second review, given the team's greater experience, the inclusion/exclusion criteria were applied to the titles and abstracts in a single stage. In 2004, 2,095 papers were screened; in 2005, 1,197 papers were screened. Across the two years, there were 3,324 papers screened, with an additional 25 identified by handsearching in 2004.

In 2004, 75% of papers were excluded at this title and abstract screening stage. In 2005, 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) at the title and

Table 3.2 Exclusion at abstract screening

	Exclusion criteria	Only 2004	Only 2005	Total 2005	% only 2004	% only 2005	% total 2005
Criterion 1	Not focused on special educational needs	176	90	**266**	12.63	10.84	**11.96**
Criterion 2	Not conducted in mainstream classroom	221	140	**361**	15.85	16.87	**16.23**
Criterion 3	Not concerned with pedagogical approaches	489	215	**704**	35.08	25.90	31.65
Criterion 4	Not indicating pupils outcomes	172	61	**233**	12.34	7.35	**10.48**
Criterion 5	Not all or part of 7–14 year age range	66	23	**89**	4.73	2.77	**4.00**
Criterion 6	Not empirical study or systematic review	266	300	**566**	19.08	36.14	**25.45**
Criterion 7	Not written in English	1	1	**2**	0.07	0.12	**0.09**
Criterion 8	Not produced or published after 1994	3	0	**3**	0.22	0.00	0.13
Total		*1,394*	*830*	*2,224*			

Table 3.3 Exclusion at full document screening

	Exclusion criteria	Only 2004	% only 2004	Only 2005	% only 2005	Total 2005	% total 2005
Criterion 1	Not focused on special educational needs	6	1.90	4	4.44	10	2.47
Criterion 2	Not conducted in mainstream classroom	33	10.48	10	11.11	43	10.62
Criterion 3	Not concerned with pedagogical approaches	96	30.48	21	23.33	117	28.89
Criterion 4	Not indicating pupils outcomes	63	20.00	25	27.78	88	21.73
Criterion 5	Not all or part of 7–14 year age range	17	5.40	7	7.78	24	5.93
Criterion 6	Not empirical study or systematic review	107	31.75	23	25.56	123	30.37
Criterion 7	Not written in English	0	0.00	0	0.00	0	0.00
Criterion 8	Not produced or published after 1994	0	0.00	0	0.00	0	0.00
Total		322		90		405	

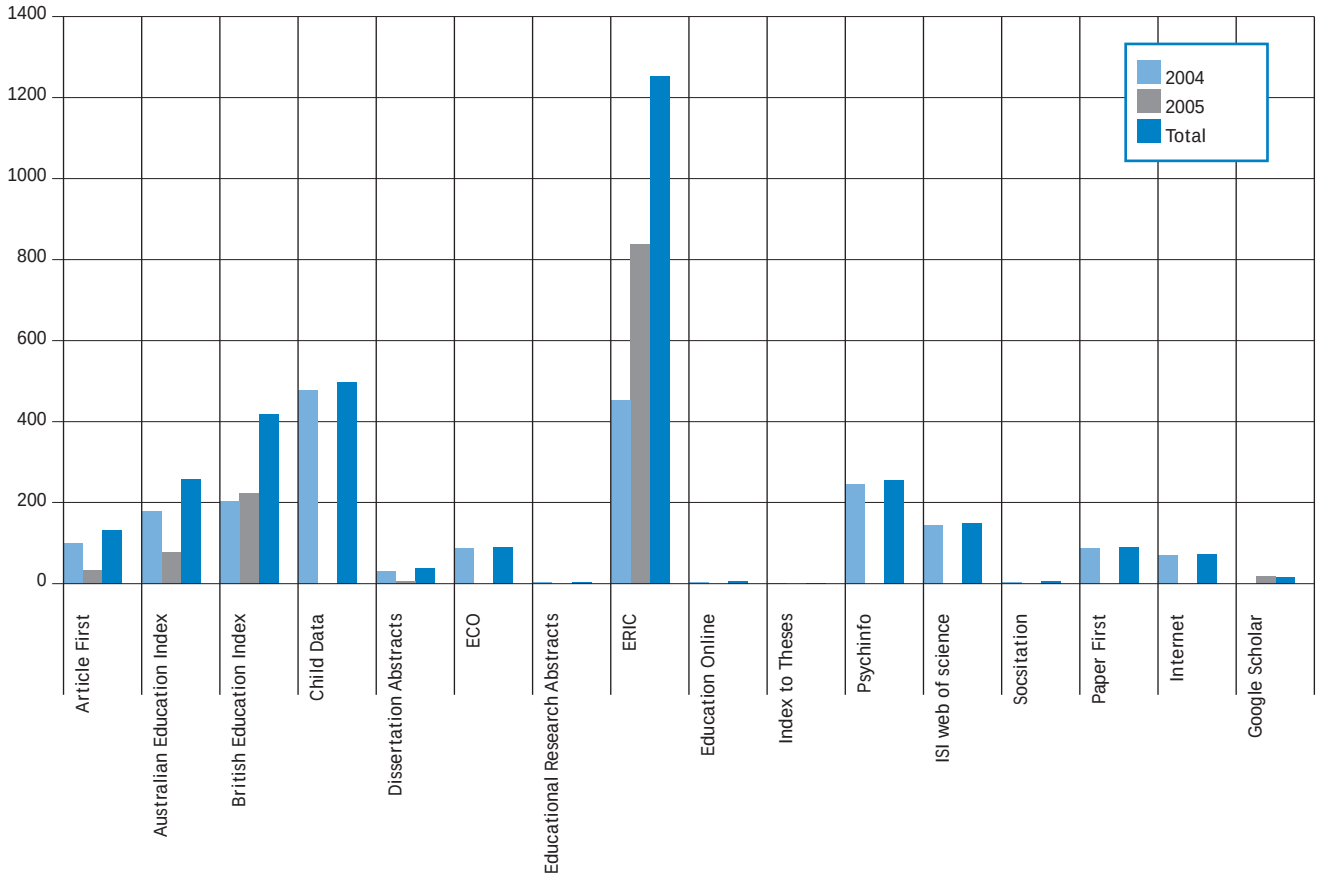
abstract screening stage. In 2005, 830 papers were excluded, making a total of 2,224 papers excluded across the two years (see Table 3.2). This resulted in 450 potential includes in 2004 and 201 potential includes in 2005. Across the whole period, there were 587 potential includes. In 2004, however 64 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; these were entered into a third database (EndNote 3).

Once again, in 2005, a cut-off date for retrieval of the full documents for screening was set as 31 March. Of the 201 titles to be screened, 70 were not obtained by this cut-off date, and were therefore excluded from the full document screening. 73% of these (51 papers) were papers that were also not obtained in 2004. 20% of those still unavailable were theses and 10% were conference papers. We are still trying to obtain these papers for 2006. 10% of papers that were included in the systematic map after the full document screening were unpublished studies. The list of material documents that were not obtained for screening can be found in Appendix 3.1.

90 papers were excluded in 2005 at the full document screening stage. 322 had been excluded in 2004, meaning that across the two years of the study, 405 papers (involving 412 studies) were excluded. As can be seen in Table 3.3, there were only small differences in the percentages of papers excluded under each criterion across the two years.

The full document screening from 2005 resulted in 41 studies being included in the systematic map. These studies were combined with the 68 studies that had been included in the systematic map for 2004, resulting in a final systematic map of 109 studies. These 109 studies were now distributed among pairs of reviewers within the team for keywording.

Figure 3.4 Database origins (prior to removal of duplicates: 2004 N = 2,095; 2005 N = 1,197; total N = 3,292)



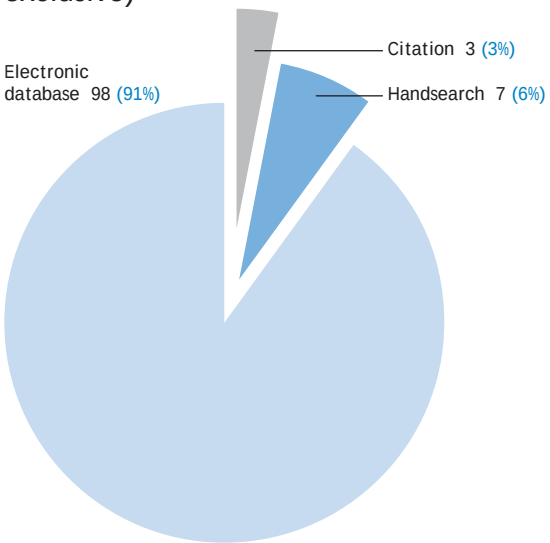
3.2 Characteristics of the included studies (systematic map)

Of the 109 studies within the systematic map, 68 had been keyworded in the first review. However, these studies had not had the additional review specific keywords applied to them. In this review, therefore, we fully keyworded the 41 new studies and carried out the additional keywording of the 68 studies from the previous year.

3.2.1 Identification of studies (EPPI-Centre keywords)

The pie chart (Figure 3.5) shows the method of identifying potential studies within the systematic map. There is clearly 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, there is a risk attached to relying as heavily as we have done upon electronic searching.

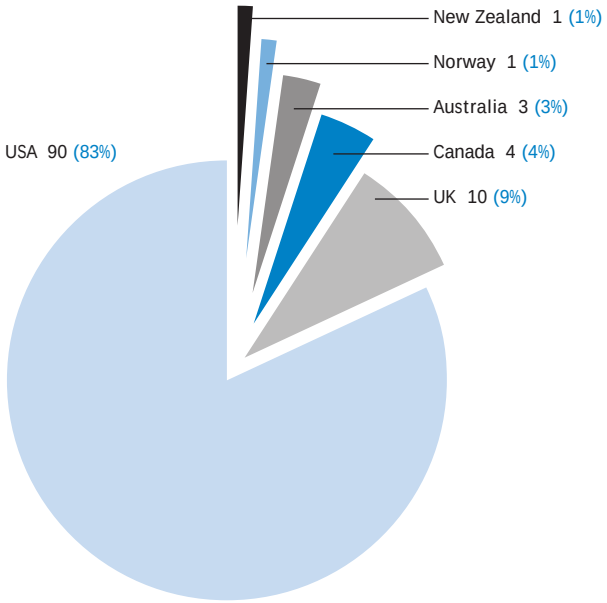
Figure 3.5: Sources of papers identified in the map (N = 109 studies; codes mutually exclusive)



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 both years it has been evident that the vast majority of studies have come from the United States of America (USA). 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 English language research is being done in the USA.

Figure 3.6: National contexts (N = 109 studies; codes mutually exclusive)



In 2005, it was also evident that programmed interactions have a far higher USA research profile than in the UK.

Table 3.4: Studies of programmed interaction by country (N = 109 studies)

	Number of studies	Programmed interaction evidenced
Australia	3	1
New Zealand	1	0
Norway	1	0
UK	10	1
Canada	4	1
USA	90	26
Total	*94*	

3.2.3 Study type (EPPI-CENTRE keywords)

Study type describes the levels of analysis in a paper 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 have a section of description. In three papers, two keywords were used, but in all the others we applied the definition that could be aptly applied and was furthest along the hierarchy. Considering the dominance of USA studies within this review, and the high propensity of evaluation – researcher-manipulated study types in the USA (57 out of 90 USA studies), it is predictable that this study type should dominate the review. Of these studies, 25 were identified through keywording as researcher-manipulated evaluations and controlled trials; six of these were identified as being randomised.

Table 3.5 Study type by country (N = 109 studies)

	Number of studies	Randomised control trial	Controlled trial (non-randomised)
Australia	3	0	0
New Zealand	1	1	0
Norway	1	0	0
UK	10	0	1
Canada	4	1	1
USA	90	4	17
Total	109	6	19

Figure 3.7: Study type (N = 109 studies; codes not mutually exclusive)

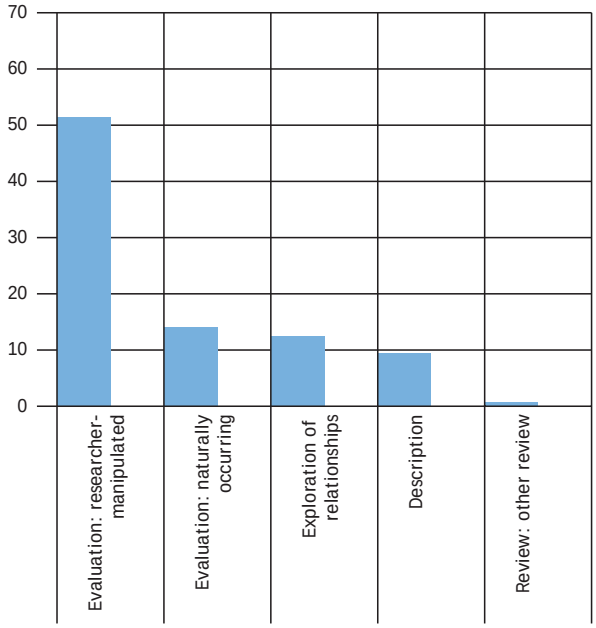
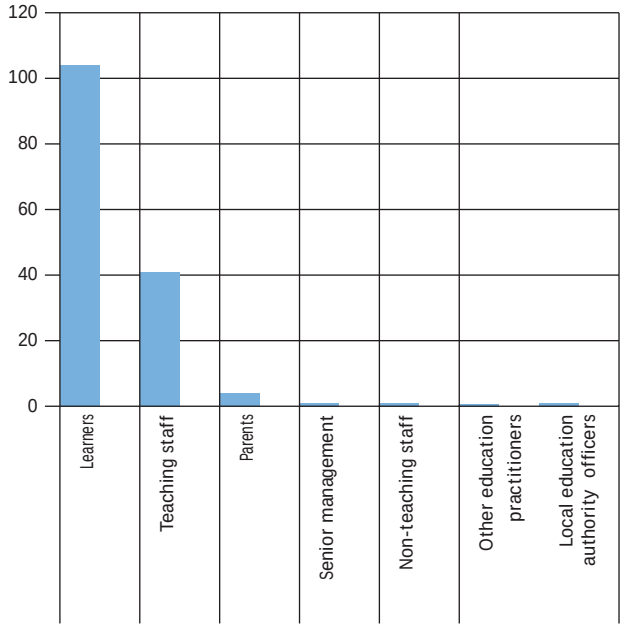


Figure 3.8: Population focus of studies (N = 109 studies; codes not mutually exclusive)



In the 2004 review, it was noted that researcher-manipulated evaluations in the USA are more than four times as common as any other single study type, and that the vast majority of controlled trials are from the USA.

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 to the population focus. Many studies included descriptions of the teachers, but the qualitative and quantitative evaluations were about the pupils. Over 95% of studies in this review (104 out of 109)had a focus upon learners (see Figure 3.8). This is to be expected as criterion 4 excluded studies that did not indicate pupil outcomes.

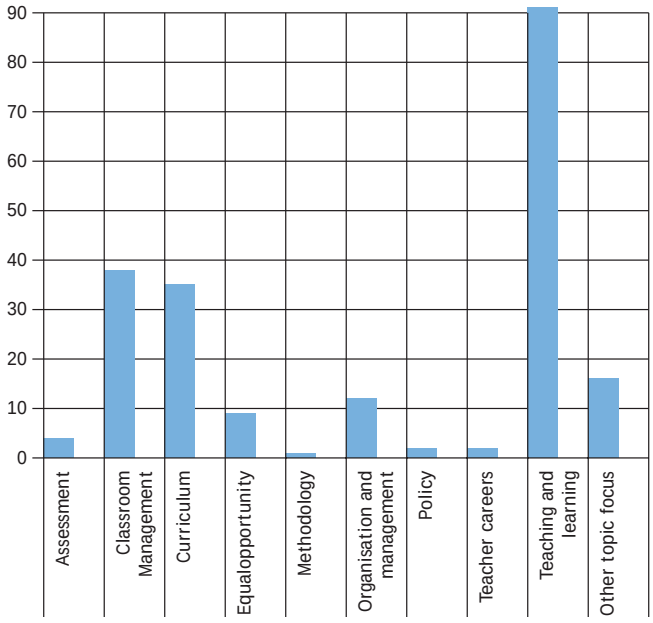
3.2.5 Study focus (EPI-Centre keywords)

Study focus describes aspects of the educational process that are explored within a paper. More than one aspect can serve as a focus and so over 55% of studies were given more than one keyword. The most common keyword both on its own and in combination with others was 'Teaching and learning'. 83% of the studies 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 pupil behaviour by teachers.

Classroom management was the second most common form of study, followed by those with a curriculum focus (see Figure 3.9). In many studies, the curricular area is noted, but this would not necessarily make the subject area a central focus of the research. The most common curriculum focus was literacy, followed by a general curricular focus, then mathematics and science. This reflects the current priorities for USA and UK policy-makers, as well as the nature of the curriculum for primary age pupils.

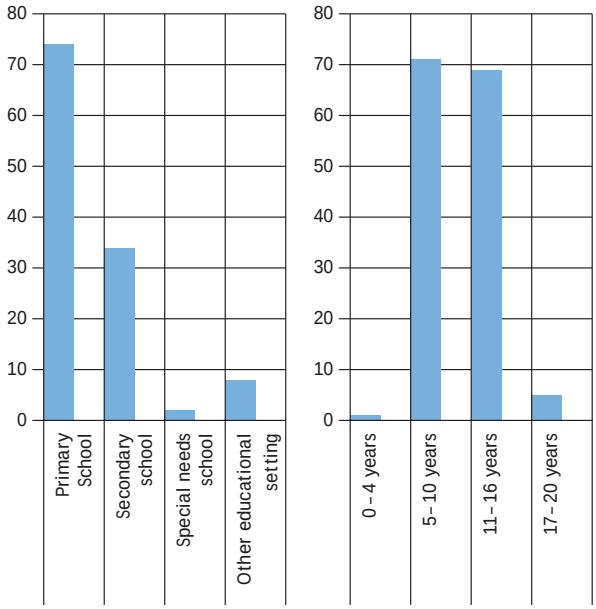
Figure 3.9: Study focus (N = 109 studies; codes not mutually exclusive)



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. More than twice as many studies (62%) involved these settings. However, this difference is not as clear cut in the age ranges. 71 of the studies included pupils aged 5–10, and 69 included pupils aged 11–16. Both these age ranges can be narrowed further too, since criterion 5 was to exclude studies from the map which were not all or part of the 7–14 age range. This demonstrates that many of the studies included pupils in the upper ranges of the Primary School bracket. Another factor is the tendency, particularly in USA 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. 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.

Figure 3.10: Setting and age range of studies (N = 109 studies; codes not mutually exclusive)

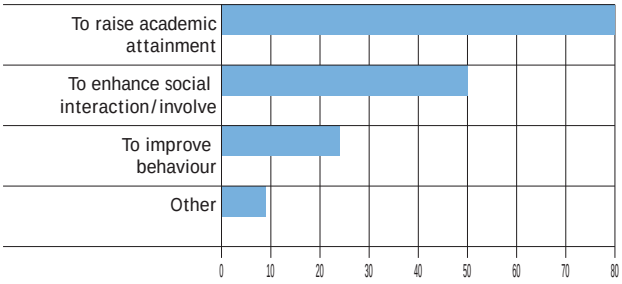


It is also interesting to note that the vast majority of studies involved pupils of mixed sex (N=83), though here too this was often not clearly stated, but had to be surmised. Of single sex studies, boys were nearly four times as likely to be the focus as girls. This may be a reflection of the gendered inequality (Benajmin, 2003) that results in a higher percentage of male pupils being identified as having special educational needs.

3.2.7 Aim of teaching approach (review-specific keywords)

Over 70% of studies examined approaches that aimed to raise the academic attainment of pupils; over 45% aimed to enhance social interaction and involvement. 22% of studies were intended to improve behaviour (see Figure 3.11). Clearly, a number of studies identified more than one aim for the approach being researched.

Figure 3.11: Aim of the teaching approach (N = 109 studies; codes not mutually exclusive)



3.28 Outcome of teaching approach (review-specific keywords)

At the start of this review, in 2004, 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 claimed raised academic attainment, followed by those which had claimed enhanced social interaction. This reflected the priorities of the aims identified above, but highlighted too the number of papers that aimed to raise academic attainment but did not report doing so. Of these studies that aimed to raise attainment, 11 did not report outcomes. On closer inspection, it was also noticeable that there was a number of studies that did not aim to raise social interaction or improve behaviour but had this as an outcome.

There were studies that reported mixed positive and negative outcomes or other outcomes, which were not linked to attainment, interaction or behaviour. These outcomes were linked to effects on teachers and others individuals and issues related to the learning context.

3.2.9 Who judges outcomes? (review-specific keywords)

Hardly surprisingly, over 90% of research outcomes are primarily judged by the researcher, with the teacher being involved in 40% of studies (see Figure 3.12). Since 95% of the studies have the learners as their focus, and 83% have teaching and learning as a focus, it might be hoped that a greater number of pupils would be involved in assessing the outcomes of research, particularly when 44% of the studies claim enhanced social interaction and involvement.

Figure 3.12: Who judges the outcomes? (N = 109 studies; codes not mutually exclusive)

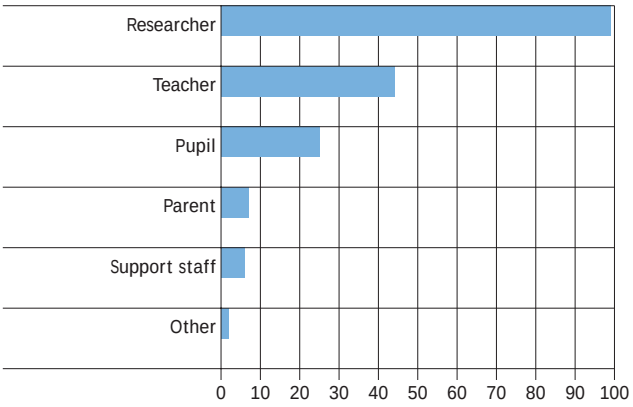


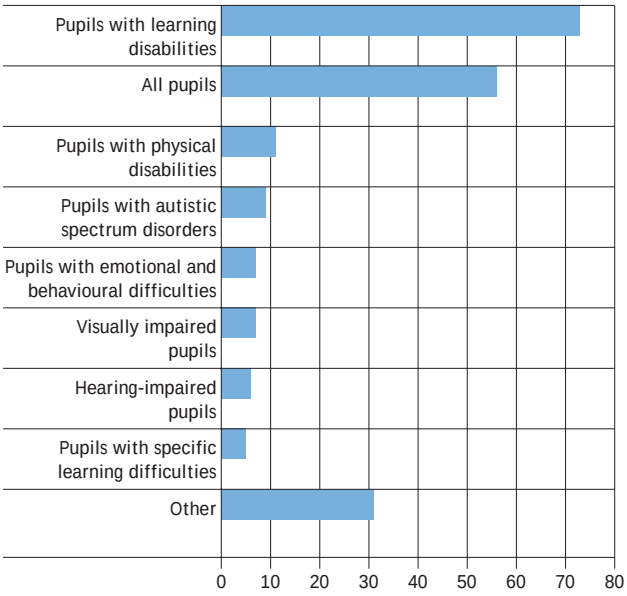
Table 3.6: Outcomes of teaching approaches (N = 109 studies; codes not mutually exclusive)

Attribute	Positive outcomes	Percentage of total studies	Positive and negative outcomes	Percentage of total studies
Raised academic attainment	60	55%	9	8%
Enhanced social interaction/involvement	49	44%	6	6%
Improved behaviour	29	26%	1	1%

3.2.10 Target group (review-specific keywords)

The principal target groups for teaching were pupils with learning disabilities (66%) and all pupils (51%) (see Figure 3.13). This focus on all pupils reflected the mainstream settings of these studies and that nearly half of the studies aimed to enhance social interactions within the setting. Considering the concern expressed by many teachers about how best to support pupils with emotional and behavioural difficulties, it would seem that there is little research within the mainstream to support their practice.

Figure 3.13: Target group for the teaching approach (N = 109 studies; codes not mutually exclusive)



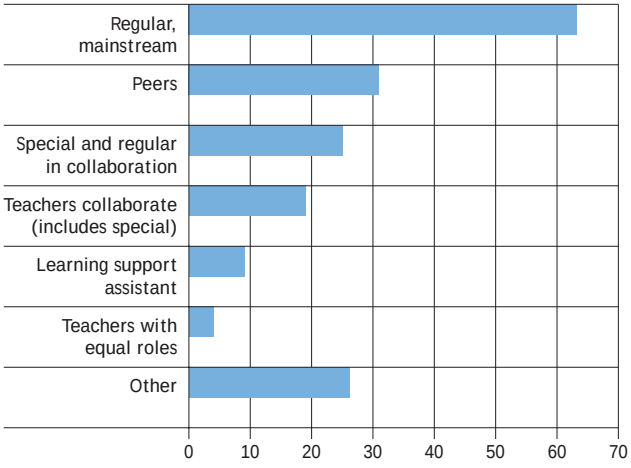
3.3.11 Staff involved (review-specific keywords)

Considerable emphasis has been placed on the importance of support staff in enabling the inclusion of pupils with special educational needs within mainstream settings. The comments of users to members of the Review Group suggest that many teachers still find themselves working without support for a large part of any working day. Identifying the staff involvement within these studies is therefore particularly relevant. Our original keywording strategy, however, was not entirely satisfactory. Here again, we had included single and combined categories, but had not fully taken into account the enormous range of terms that would be used in papers to describe those who work within the classroom. This can be seen by the types of practitioners included in 'Others':

- Researcher – 6 studies
- Graduate interns – 2 studies
- Special education teacher – 8 studies
- Preservice teacher – 1 study
- Parents – 2 studies
- Inclusion support teacher – 2 studies
- Speech and language therapist – 1 study
- Assistive technology specialist – 1 study
- Learning support teacher – 1 study

To try to assist with the keywording, we introduced a new keyword 'Teachers in Collaboration' (includes special teachers) for 2005. This includes the keywords 'teachers with equal roles/ responsibilities in collaboration' and 'special teacher and regular teacher in collaboration'. The most commonly used keyword was Regular mainstream teacher (N=63) followed by Peers (N=31) and others (N=26) (see Figure 3.14).

Figure 3.14: Who does the teaching? (N=109 studies – Codes not mutually exclusive)



Since the categories are not mutually exclusive, it was possible for the 109 studies to have 179 keywords applied to them. On the basis of the Figure 3.14, it appears as if the largest group of studies involves the 'Regular mainstream teacher' working on their own. However, because more than one keyword was available to describe a collaborative process, the number of studies involving teachers in collaboration are downplayed in significance. If the three categories ('Special and regular teachers in collaboration', 'Teachers with equal roles' and 'Teachers collaborate') are combined, we find that 50 studies involved people working collaboratively. With the inclusion of the

Table 3.6: Teachers working with others or alone (N = 109 studies)

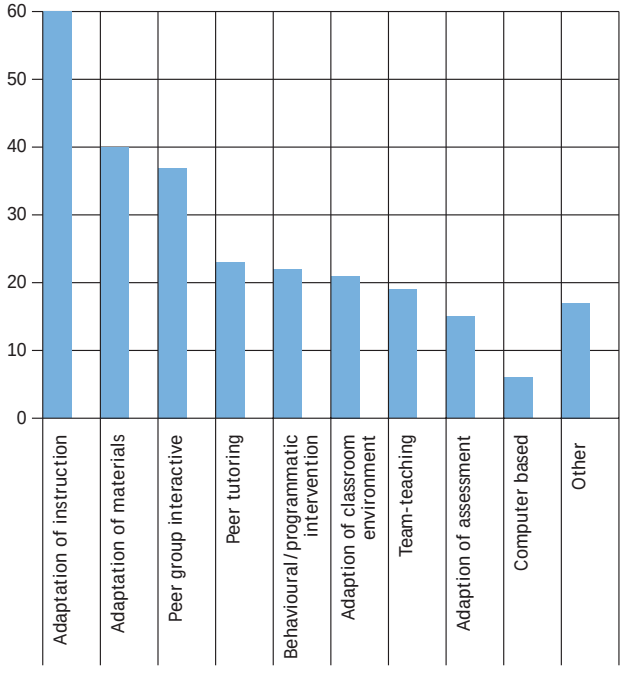
Teachers in collaboration (Special and regular in collaboration, teachers with equal roles and teacher collaborate)	**Teachers in collaboration** (Special and regular in collaboration, Teachers with Equal roles and Teacher Collaborate + others)	**Regular teacher entirely on own**
50	61	31

11 studies involving teacher support, the number of studies involving people working collaboratively rises to 61. When the overlaps are removed between categories, it therefore transpires that 61 studies involve some sort of collaboration or teacher support, and only 31 studies (28%) involve the regular teacher on their own (see Table 3.7). This 28% also includes some studies that involved peer support for the teacher. The remaining studies involve support staff, pupils or researchers working independently of others.

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

The studies were keyworded according to the nature of the teaching approach studied. Once again the categories are not mutually exclusive and the 109 studies were keyworded 260 times. The most common approaches within the studies were Adaptation of instruction (55%), Adaptation of materials (40%) and Peer Group Interactive (34%), which formed the focus for in-depth review of the first year systematic review.

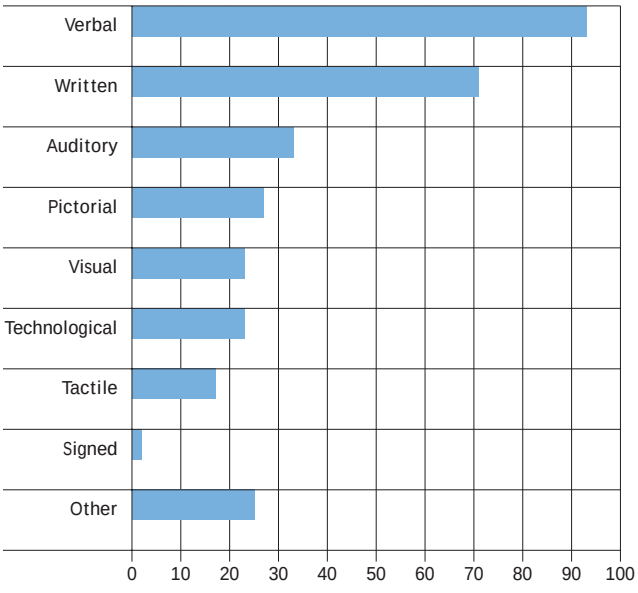
Figure 3.15: Nature of the teaching approach (N = 109 studies; codes not mutually exclusive)



3.3.13 Form of interaction (review-specific keywords)

Nearly all the studies gave evidence of a variety of interaction forms, so that the 109 were keyworded 311 times. Verbal interactions were most evident (84%) followed by written (64%); the rest were all present for 21%-29% of studies, apart from tactile (15%) and signed (1%). The comparative failure to include hands-on activities and signing within these studies highlights a major challenge for researchers and teachers, as both of these methods are widely seen in non-mainstream settings as integral to the support of pupils who experience difficulties in learning.

Figure 3.16: Forms of interaction evidenced (N = 109 studies; codes not mutually exclusive)

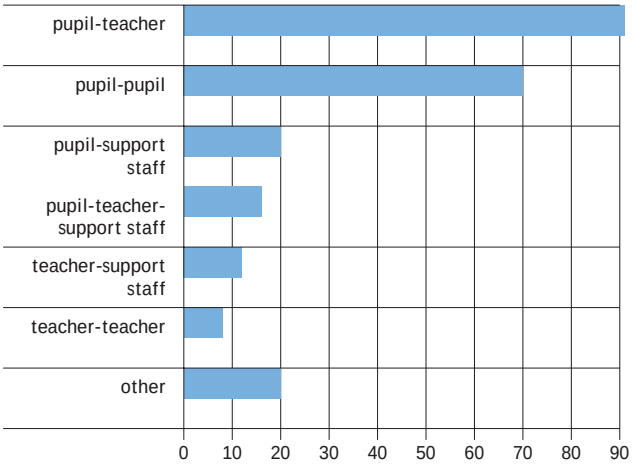


3.3.14 Participants in the interaction (review-specific keywords)

The majority of the studies gave evidence of pupil-teacher interactions (83%) and pupil-pupil interactions (63%), but far less attention was paid to the interactions involving pupils, teachers and support staff (14%), pupils and support staff (18%) and between staff (18%). This relative lack of focus on support staff occurs despite 60% of studies involving additional practitioners in the classroom.

This lack of engagement with the interactions involving those practitioners makes it far harder to assess the impact of those practitioners on the success of the studies and the teaching approaches they examine.

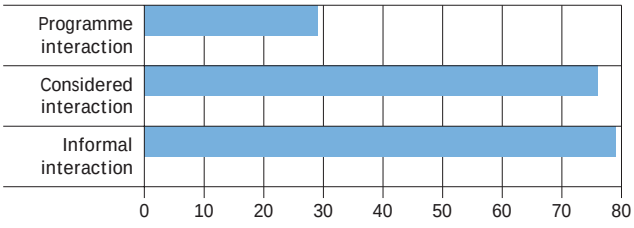
Figure 3.17: Participants in interactions (N = 109 studies; codes not mutually exclusive)



3.3.15 Type of interaction (review-specific keywords)

The most commonly identified interactions were informal (72%) and considered (68%), both of which were about three times more common than the programmed interactions (26%). These categories were not mutually exclusive, of course, and so the 109 studies were keyworded 182 times.

Figure 3.18: Types of interactions (N = 109 studies; codes not mutually exclusive)



3.3 Identifying and describing studies: quality-assurance results

There was a rigorous approach to the quality-assurance for the identification and description of studies in the systematic map. All studies were independently screened and keyworded by two members of the Review Group, so that at no point did lone researchers make decisions. In addition, EPPI-Centre colleagues played a central role in helping to assure quality when (a) identifying studies of potential importance and (b) applying inclusion and exclusion criteria. This role involved both identifying possible weaknesses in the process and requesting clarification of the Review Group's intentions at each planning stage.

Screening by titles and abstracts

The titles and abstracts were screened by two members of the team working independently. There was an initial 80% agreement rate on which studies to include. The two reviewers looked at any disagreements again together and reconciled the differences. An EPPI-Centre colleague also carried out a separate moderation of 10% of studies to assess if there were inconsistencies in applying the inclusion and exclusion criteria.

Full text screening

At the third stage of screening, the same exclusion criteria were applied after a detailed examination of the studies. 131 papers were examined in 2005, by two reviewers, with 10% being assessed by a third EPPI-Centre reviewer. There was 85% agreement (0.65 Cohen's Kappa) in the application of these criteria in 2005 and 80% (0.62 Cohen's Kappa) in 2004. Again the two reviewers met to moderate their decisions, coming to agreement over papers which they had rated differently.

Keywording

Keywording of the 109 studies involved pairs of independent reviewers from across the Review Group. Again there was very close agreement in the keywording of the pairs of Review Group members, with differences being agreed after detailed discussion. Our EPPI-Centre colleague again moderated this process, independently keywording over 10% of studies.

3.4. Summary of results of map

Our interest in teaching approaches that effectively include children with special educational needs in mainstream classrooms dictated the context and the focus on pedagogy. The particular contexts examined in the review are in mainstream schools, serving the 7–14 age range. It was also agreed to focus on those studies that indicated pupil outcomes, that were written in English, and that were published within the last ten years. 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.

The studies included in the review proceeded through a series of graduated filters. 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 full copies of as many as possible of those studies were obtained. The inclusion/exclusion criteria were applied to the full documents so as to exclude any which, upon fuller scrutiny, did not meet the inclusion criteria. All the studies which remained were keyworded using *EPPI-Centre Core Keywording Strategy, Version 0.9.7* (EPPI-Centre, 2002a), together with some additional review-specific keywords. This process permitted the building of a 'descriptive map' of studies in our review. The full document screening from 2005 resulted in 41 papers being included in the systematic map. These papers were combined with the 68 papers in the 2004 systematic map, resulting in a final systematic map of 109 studies.

Across the two years, 3,324 papers were identified for potential inclusion. After removing duplicates, 2,812 were screened according to their titles and abstracts or by hand. At this first stage, 2,224 were excluded for not meeting the inclusion/exclusion criteria of the review. Of these, the most common reasons for exclusion were: not being empirical studies (30%), not being concerned with pedagogical approaches (29%), and not indicating pupil outcomes (22%).

In this current review, 587 papers were identified for more detailed reading, but 70 papers were not obtained by the cut-off date. 517 full documents had the inclusion/exclusion criteria applied to them, with 405 papers being excluded at this full document screening stage. Again the three most common criteria for exclusion were the categories identified above. Four studies were also found to be reported in two papers. The systematic map therefore included 109 studies (68 from 2004 and 31 from 2005).

91% of the studies were identified through electronic databases, and 83% came from the USA. 9% of the studies came from the UK. Over 90% of the studies were either evaluations or explorations of relationships, and over 80% focused upon teaching and learning. 55% of the studies claimed an impact upon academic attainment and 44% upon social interaction/involvement. The majority of studies took place within the primary sector, but there were equal numbers of studies looking at children 11 and over and 10 and under.

Less than one-third of studies focused upon the regular teacher working on their own in classroom, although the majority of studies gave some evidence about pupil-teacher interactions and far less about the interactions involving support staff. The majority of these interactions were informal and considered, with the minority being to some degree programmed in nature. Particularly noticeable too was the emphasis upon verbal and written interactions, in comparison with other forms, particularly tactile and signed interactions.

CHAPTER FOUR

In-depth review: results

This chapter provides a detailed account of the studies included in the in-depth phase of the systematic review. It offers a narrative description of each study and then synthesises the evidence. It also provides an account of the process of assuring the quality of results and, in the final section, refers to the actual involvement of users of the review.

4.1 Selecting studies for in-depth review

As already described in Chapter 2, much discussion took place among members of the Review Group and to a lesser extent among user team members and external colleagues about the precise focus of the in-depth review and which cluster of studies should be selected for inclusion. Having produced the systematic map of the 109 studies, we had to narrow down the focus to a clear, useful and answerable question. It was agreed that we should build on the evidence made available in the first year's review which focused specifically on peer interactions. Our overarching concern in all our discussions was to provide evidence of strategies that all teachers in mainstream classrooms could use in order to include pupils with special educational needs.

It had been pointed out that teaching and learning had to be central to the studies. It was decided that a priority was interactions that involved mainstream classroom teachers. The view represented to us in our meetings was that, since teachers spend considerable time without support staff in the classroom, the focus should be upon their interactions as opposed to collaborative approaches incorporating other staff. We decided, therefore, to include those studies that involved only the mainstream teacher. It was also deemed important to refer to outcomes. It was considered important to attend to both academic and social outcomes since 'inclusion' comprises both. Attention to the nature of interactions linked to academic and social outcomes for pupils with special educational needs had the potential to inform us about classroom environments that would maximise learning. This meant that studies that only offered descriptions of interactions and did not link interactions to outcomes would not be appropriate for consideration in the review.

It will be recalled from the previous chapter that we had identified and defined different forms of interaction in our review-specific keywording. The Review Group decided that studies that incorporated a focus on 'programmed' interaction would not have sufficient relevance to merit their inclusion in the in-depth review. As we have explained, such interactions are highly scripted and prescriptive, and, as such, it was considered that they would not align well with the reality of classroom life in schools in the United Kingdom.

Eventually, there was agreement that evidence about interactions within pedagogical approaches, more specifically evidence of interactions linked to outcomes for pupils with special educational needs, is highly relevant to teachers. In the light of our deliberations, including discussion with our EPPI-Centre colleagues, we framed our in-depth review question as follows:

What is the nature of the interactions in pedagogical approaches with reported outcomes for the academic and social inclusion of pupils with special educational needs?

Table 4.1: Studies excluded on the basis of in-depth criterion (IDC)

In-depth criterion 2.1	**In-depth criterion 2.2**	**In-depth criterion 2.3**	**In-depth criterion 2.4**	**In-depth criterion 2.5**
Exclude if it does not have a focus on teaching and learning	Exclude if it does not have a focus on outcomes for the academic achievement and social inclusion of pupils with special educational needs.	Exclude if it involves a collaborative teaching approach.	Exclude if studies are not exploration of relationships or evaluations.	Exclude if it has some focus upon programmatic interactions.
N = 18	N = 50	N = 32	N = 1	N = 1

On the above basis, we identified our in-depth criteria for excluding and including studies. Table 4.1 shows our inclusion and exclusion criteria.

In relation to the first exclusion criterion, we should note that the review-specific keywording asked 'Who does the teaching?'. Therefore, studies involving primarily the mainstream teacher had already been identified. The criteria were applied as a hierarchy, so that a study excluded under IDC 2.1 could potentially have been excluded under any of the other criteria too. The majority of studies were excluded under IDC 2.2, and then IDC 2.3. As is evident from the table above, only two studies were excluded under IDC 2.4 and IDC 2.5.

The following seven studies met the inclusion and exclusion criteria in the in-depth review:

Jordan A, Stanovich P (2001) Patterns of teacher-student interaction in inclusive elementary classrooms and correlates with student self-concept. *International Journal of Disability, Development and Education* **48:** 33–52.

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

Rieth HJ, Bryant DP, Kinzer CK, Colburn LK, Hur SJ, 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.

Tindal G, Nolet V (1996) Serving students in middle school content classes: a heuristic study of critical variables linking instruction and assessment. *Journal of Special Education* **29:** 414–432.

Wallace T, Anderson AR, Bartholomay T, Hupp S (2002) An ecobehavioral examination of high school classrooms that include students with disabilities. *Exceptional Children* **68:** 345–359.

Ward J, Center Y (1999) Success and failure in inclusion: some representative case histories. *Special Education Perspectives* **8:**16–23.

Zembylas M, Isenbarger L (2002) Teaching science to students with learning disabilities: subverting the myths of labeling through teachers' caring and enthusiasm. *Research in Science Education* **32:** 55–79.

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

4.2.1 Topic of research

The topic of research uniting all the studies in the in-depth review is 'teaching and learning'. Table 4.2 shows other foci of the studies identified for the review.

Table 4.2: Research topic focus for studies in the in-depth review (N = 7)

Research topic	**Number**	**Studies**
Teaching and learning	7	Jordan and Stanovich (2001), Palincsar et al. (2001), Rieth et al., (2003), Tindal and Nolet (1996), Wallace et al. (2002), Ward and Center (1999), Zembylas and Isenbarger (2002)
Curriculum	4	Jordan and Stanovich (2001), Palincsar et al. (2001), Tindal and Nolet (1996), Zembylas and Isenbarger (2002)
Classroom management	1	Wallace et al. (2002)

4.2.2 Curriculum area

Three studies focused on the science curriculum as shown in Table 4.3. These three studies focused exclusively on science (Palincsar et al., 2001; Tindal and Nolet, 1996; Zembylas and Isenbarger, 2002). Despite the curricular profile in the descriptive map which had a preponderance of studies on literacy (or language arts or literature or English), only one study here addressed this curricular area exclusively (Rieth et al., 2003).

4.2.3 Educational setting

All the studies except for one (Tindal and Nolet, 1996) took place in the primary or secondary school years (see Table 4.4).

4.2.4 National context

As in the descriptive map, the national context for the studies in the in-depth review is dominated by the USA with five of the seven studies conducted there, while one study (Jordan and Stanovich, 2001) was set in Canada and one in Australia (Ward and Center, 1999).

4.2.5 Research design

Of the seven studies, five are evaluations, mostly researcher-manipulated. Table 4.5 shows the pattern of study types. In the descriptive map, the majority of the studies are evaluations, again mostly researcher-manipulated.

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

This section presents a narrative outline of each study selected for the in-depth review with reference to conceptual focus and context, research design, and key findings and/or conclusions. We also note reviewers' agreed judgements on aspects of the study. In Appendix 4.1, we present key elements of the studies in an attempt to offer the reader a more thematic overview. Following this, we discuss the reviewers' final ratings of trustworthiness of the researchers' approach and conclusions, and consider the weight of evidence allocated. This leads to a synthesis of the evidence from the studies.

Table 4.3: Curriculum focus for studies in the in-depth review (N = 7)

Curriculum area	Number	Studies
General	3	Jordan and Stanovich (2001), Wallace et al. (2002), Ward and Center (1999)
Literacy – first languages	1	Rieth et al. (2003)
Literature	1	Rieth et al. (2003)
Science	3	Palincsar et al. (2001), Tindal and Nolet (1996), Zembylas and Isenbarger (2002)

Table 4.4: Educational setting of studies in the in-depth review (N = 7)

Setting	Number	Studies
Primary school	4	Jordan and Stanovich (2001), Palincsar et al. (2001), Ward and Center (1999), Zembylas and Isenbarger (2002)
Secondary ('intermediate') school	3	Rieth et al. (2003), Wallace et al. (2002), Tindal and Nolet (1996)

Table 4.5: Study type for studies in the in-depth review (N = 7)

Type of design	Number	Studies
B. Exploration of relationships	2	Jordan and Stanovich (2001), Wallace et al. (2002)
Ca. Evaluation: naturally occurring	2	Tindal and Nolet (1996), Ward and Center (1999)
Cb. Evaluation: researcher-manipulated	3	Palincsar et al. (2001), Rieth et al. (2003), Zymbylas and Isenbarger (2002)

4.3.1 Jordan and Stanovich (2001) Patterns of teacher-student interaction in inclusive elementary classrooms and correlates with student self-concept

This study is set in classrooms of third and fourth graders in primary schools in Canada. With reference to nine teachers in six inclusive classrooms, it explored the relationships across the following variables: teachers' beliefs about their roles and responsibilities to learners with special educational needs, their teaching practices, and the self-concept of their students.

Evidence about teachers' beliefs was collected through one-to-one interviews, using the 'Pathognomnic-Interventionist Scale for Teachers'(a published inventory). This scale facilitates a description of teachers along a continuum from 'pathognomnic' (PATH) to 'interventionist' (INT). Teachers with PATH perspectives rarely adjust their instructional approaches, viewing this as the responsibility of special education resource personnel. Teachers with INT perspectives use a variety of adjustments in their teaching to accommodate the needs of pupils with special educational needs, while MID teachers adapt their instructional methods but abandon them quickly if they are not successful. In interviews using this scale, the researchers in the study asked the participating teachers to describe their work with two students, one assessed as exceptional and one or two whom the teacher nominated as being at risk of future possible educational intervention. The teacher was asked to describe in detail how he/she had worked with those students.

Evidence of teachers' practices was collected through several lesson observations per teacher, focusing on interactional patterns in core subjects (language arts, science or mathematics). Conversational sequences between the teacher and any one of the target students during the individual seatwork part of the lesson were transcribed and later coded into categories. Small group activities involving the teacher and two or three of participating students were also collected and analysed. The researchers applied three analytic categories to the classroom interactions: interactions were defined as 'comprehension monitoring' (brief interaction to check a student's understanding but not requiring a response), 'cognitive extension' (where the teacher involved the student in interaction about the academic material), or 'non-academic interaction' (defined as 'interaction about classroom routines and organisation').

Evidence of the target pupils' self-concept was collected through the Piers Harris Children's Self Concept Scale, an 80-item dichotomously-scored self-report, published scale yielding a total score and six subset scores. The subsets were Behaviour, Intellectual and School Status, Physical Appearance and Attributes, Anxiety in the Classroom, Popularity, and Happiness and Satisfaction.

Statistical methods were used to analyse the data from all three sources. The reviewers agreed that appropriate measures were taken to address the reliability and validity of both data collection and data analysis.

The study provided evidence to show that the beliefs of the teachers about their responsibilities for students were linked to differences in their interactional patterns with both 'typically-achieving' (TA) and 'exceptional/at risk' (EX/AR) students. Those teachers who emerged as having INT beliefs engaged in considerably more individual and small group interactions with EX/TA and TA students. They operated at higher levels of cognitive engagement, compared with teachers holding PATH or MID beliefs. Teachers with PATH beliefs interacted least with students who were EX/AR. The researchers concluded that 'INT teachers spent much time in academic interaction and at high levels of cognitive engagement with students at all levels of understanding, while PATH teachers spent comparatively little time and in a more transmissive style' (p 45). Also, in the classrooms of the teachers expressing PATH beliefs, the self-concept total scores of both groups of students were significantly lower than those of students in the classrooms of those teachers deemed MID and INT-oriented. A valid conclusion that the researchers draw is that the opportunity to learn might be enhanced for all learners if teachers are able to engage in extended interactions at an individual level and if they adapt their teaching to fit the level of understanding of their students.

The reviewers agreed that this study had no serious shortcomings, although they expressed some concerns about ethical procedures and the lack of information about the broader school policies and cultures of the individual teacher participants. They also noted the low number of teachers in the study (N=9), making generalisability a challenge. They considered that the study was of medium trustworthiness in terms of addressing its own research focus (WoE A). They also rated the study overall as offering medium weight of evidence for the quality of execution, appropriateness of design and relevance of focus to address the systematic review question (WoE D).

4.3.2 Palincsar A S 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 USA, 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 because of 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, in which 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 sample derived from a network of primary teachers and university researchers (a 'Community of Practice'). All the 4th and 5th grade teachers' classes were selected for the study. While all students participated, within each class, the students with SEN were the primary participants and the major focus. A range of data-collection methods was used, including curriculum-based assessments, focus group discussions with participating teachers, interviews with target students, lesson observations, self-completion reports or diaries, and samples of students' work from posters and science notebooks.

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.

Findings from the study demonstrate that participation of students with SEN was influenced by the nature and amount of appropriate assistance/intervention received; that poor writers participated more fully when helped to document their thoughts; that pupils with SEN found it difficult to learn from large-group discussions without concrete support; that one-to-one discussion with the teacher helped pupils with SEN to maximise their learning engagement, and to rehearse for sharing their understanding; that, with appropriate social and cognitive support, pupils with SEN were able to participate and express their understanding; and that students with SEN achieved significant learning gains in science by the end of Phase 2 of the study, as did the low-achieving and normally-achieving pupils.

A key characteristic of the advanced teaching practices applied in Phase 2 of the study was 'access': (a) access of students with SEN to the instructional context and (b) access of teacher and peers to the thinking and reasoning of those students. The researchers concluded that guided inquiry science teaching does, as they hypothesised, present unique opportunities for pupils with SEN, but that conceptual understanding in science only increased significantly when their teachers used advanced teaching strategies. The research team concluded that teachers need to have deep knowledge of subject matter and that they need to engage in collaborative consideration of the subject-specific nature of instruction; they concluded that this requires time and support. The team also concluded that the social support of students with SEN is especially important in inclusive settings, particularly in small-group activities.

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 relatability in so far 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. While the study was allocated high weight of evidence ratings for some quality criteria, overall it was deemed medium in terms of weight of evidence for quality of execution, appropriateness of design and relevance of focus to answer the review question (WoE D).

4.3.3 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 USA, 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 regularly with the teacher to discuss her perceptions and review her lesson plans and her need for support.

The researchers describe five phases of AI implementation. Phase 1, '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. Their 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 group and in the larger, class group. In Phase 5, termed 'student research and presentations', 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 mulitmedia presentation in which 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 'to become active participants in academic activities' (p 181). The researchers 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, specifically in relation to the student interviews and in relation to the statistical analyses (the fact that standard deviations were not reported) which would cast doubt on the reliability of the evidence for the relatively small number of pupils in the class with disabilities. However, overall, the reviewers rated this study's weight of evidence as medium for addressing the review question (WoE D).

4.3.4 Tindal and Nolet (1996) Serving students in middle school content classes: a heuristic study of critical variables linking instruction and assessment

Located in two seventh-grade inclusive classes in a USA middle school, this exploratory study examined three components of science content classes: curriculum, verbal interactions and performance outcomes. With reference to what the researchers perceived as a lack of descriptive information about these three elements in inclusive settings, their purpose was to describe these three components, particularly as they aligned. They understood this type of research focus to be important in terms of future adaptations of curriculum, instruction and assessment in inclusive, science content classes.

'Curriculum' in this study refers to all the material resources used to support teaching, although the researchers state that 'the curriculum is predominantly textbook oriented' (p 416). They described the curriculum using a taxonomy in which content information is categorised into three knowledge elements: facts, concepts, and principles. 'Verbal interactions' was taken as the primary means of instruction and so the words (concepts) used in instruction were the focus of the researchers' interest, and more specifically, the alignment of the curriculum and verbal presentations was of key interest. 'Performance outcomes' were multiple in nature, based on three different kinds of outcomes, which, together, provided evidence of students' success in science content lessons. The first measure assessed student perception (as opposed to comprehension) in which students identified those concepts and principles they thought were important; here, students could refer to the curriculum or the instruction. Another learning measure was performance on a criterion-referenced test appearing at the end of a unit of study. A third measure of learning was students' results on a problem-solving task – in this case, an essay that involved students using information to make a decision.

Evidence on curriculum, verbal interactions and student performance was used to examine the variance (alignment) across those elements and also to determine the difference between students who were low performers and their general education peers.

The data collection took place over a two-week unit on biomes in two seventh- grade science classrooms, involving two teachers and a total of 74 students, 27 of whom had learning disabilities. In relation to the analysis of curriculum, counts were made of the facts, concepts and principles along with attributes and examples in the textual material used. Counts were also made of all these in relation to the verbal interactions in instruction. Student performance outcome measures, based on three different assessments, yielded qualitative and quantitative data.

Although the reviewers expressed some reservations regarding some aspects of the study, overall they considered that the data collection and analytic approaches were satisfactory. They considered generalisability to be rather problematic due to the low numbers in the study and the short timeframe over which data was collected.

Key findings and conclusions from the study

All information in content classes is not equal and this was not easily recognised by students with disabilities as these students had difficulty identifying key concepts of the lesson. (This is based on the assumption that frequency of appearance of facts, concepts and principles, in the text is an indicator of importance.) An implication of this finding is for teachers to probe and check student understanding during the lesson.

Verbal instruction reflected the concepts from the curriculum textbook 'in a relatively straightforward manner' (p 429). On the criterion-referenced test, there was 'considerable consistency' across the concepts within each group of students but there were 'considerable differences' in the level of performance between general education and students with disabilities, the latter having a lower pass rate. Similarly, on the task (essay) measures, general education students achieved 'significantly higher' scores than LP students. However, the scores for the use of concepts in a logical argument within the task were similar between the two groups of students. While student results on criterion-referenced tests and problem-solving tasks were different, students with learning disabilities had greater difficulty with tests and performed relatively better on the essay. The overall conclusion drawn is that the grammar of curriculum texts and of instruction needs to be considered and aligned with performance outcomes.

The reviewers considered that this study had some weaknesses, particularly that there was insufficient qualitative appreciation of the nature of interactions and pedagogical approaches, demonstrated by the reliance on an audio audit of classroom interactions

However, they deemed that the research design and analysis were adequate, and they considered that, overall, it was of medium trustworthiness for answering the review question (WoE D).

4.3.5 Wallace et al. (2002) An ecobehavioral examination of high school classrooms that include students with disabilities

The impetus for this study stemmed from what the authors claim as the trend in education in the USA towards 'a competitive system focused on quality outcomes for all youth through new levels of accountability for schools' on the one hand, and on the other hand from the inadequate research on 'teacher and student behaviour, instructional practice, and classroom ecology in inclusive classrooms at the secondary school level' (p 346).

It is an observational study of classroom ecology, teacher behaviour and student responses in classrooms in four successful inclusive secondary schools chosen by a national advisory panel. Issues under investigation included the ecological events (instructional grouping, physical arrangement, task) that describe the inclusive high school classrooms observed in this study; the teacher behaviours most typical in inclusive high school classroom; the extent to which the behaviour of the target students represent the following categories: academic responses, task management responses, and competing responses; and differences in teacher behaviours or student responses when comparing students with and without disabilities.

Data collection involved observations of teacher behaviours, student responses and aspects of classroom ecology (physical arrangement, instructional grouping and instructional task) in 118 classrooms across a range of subjects, targeting students with and without disabilities. The researchers used ecobehavioural assessment system software (EBASS). Ecobehavioral assessment is an observational research method designed to assess environment-behaviour interactions as well as the ecological contexts in which student behaviours occur. Observational evidence was collected using the code for instructional structure and student academic response-mainstream version (MS-Cissar) from the EBASS observation system – a taxonomy which facilitates the recording of variables associated with the three categories of interest (student behaviours, teacher behaviour, and classroom ecology).

Using a momentary time sampling procedure, data was collected on a laptop computer by observers positioned unobtrusively in the classroom. Descriptive and inferential statistical procedures were used to analyse the data. The reviewers considered that appropriate methods were made to ensure the reliability and validity of data collection and analysis.

Very many findings emerged from this study which can be summarised as follows:

(a) Students with and without disabilities showed high levels of academic engagement and low levels of inappropriate behaviour.

(b) There were no significant differences in the behavior of students with and without disabilities.

(c) Teachers were active in their classrooms, spending more than 75% of their time involved in instructing, managing and interacting with their students.

(d) Students with disabilities were more often the focus of their teachers' attention than students without disabilities (p 345).

The important factors associated with the successful inclusive high school classrooms included in this study appears to be active student engagement in academic learning, little time spent exhibiting competing responses, being the focus of teacher attention, and having teachers spend more than three quarters of their time focusing on

and preparing students for learning, and teaching them (p 356). Teachers must be willing to engage a diverse group of learners. A significant amount of time must be spent guiding students in their preparation for learning and directly teaching them using a variety of strategies, including technology. Also, the focus or attention of the teacher must include everyone, recommending that teachers must know a variety of instructional strategies to address the diverse learning needs of students. They recommend that knowledge of differentiated roles, collaboration and co-ordination must be taught and strategies identified for new teachers to be prepared for today's classrooms.

This study was deemed high under some quality criteria such as relevance of the particular focus for addressing the review question (WoE C). However, taking account of all the quality assessment issues, the reviewers rated the study as of medium trustworthiness for addressing the review question (WoE D).

4.3.6 Ward and Center (1999) Success and failure in inclusion: some representative case histories

This is an Australian study offering a range of descriptive case accounts of individual students with SEN. It arises from the authors' research in the 1980s that had the twin purpose of examining the educational and social experiences of a group of students with differing disabilities, and identifying factors relevant to their successful academic, social and physical integration. The study adopts a broad brush approach in that it overviews, presents and discusses aspects of that earlier work and then goes on to develop case accounts representing outcomes 'which were seen as effective, marginal and less than effective'. Both primary and secondary schools featured and the case accounts relate to eight students aged 9–16.

Data gathering involved a 'mixed naturalistic/ qualitative design' (p 20), in which tests (academic and psychometric), interviews, questionnaires and observations were carried out at child, classroom or school levels, yielding both quantitative and qualitative data. The reviewers expressed serious concerns about the appropriateness of data-collection and data-analysis methods, referring to the lack of detail in each case, although they noted the fact that the study derived from evidence collected for earlier work which was published over a decade previously.

The case studies point to the importance of a supportive school ethos and how instructional style is an important factor in total integration; that mainstreaming can be successful for pupils with physical and sensory disabilities, that it can be marginally successful for those with intellectual disabilities and language disorders, and may not be effective for those with emotional/behavioural and multiple disabilities.

The authors conclude (p 28) that 'the academic and social outcomes of mainstreaming may be highly idiosyncratic' and that therefore inclusion cannot be viewed as a unitary concept, being influenced by factors such as degree and type of disability, personality and amount of advocacy children or groups receive. However, they also conclude that salient factors contributing to successful mainstreaming of students with SEN include modifications to the curriculum as necessary; use of structured teaching strategies; the availability of trained support staff; a supportive school policy; positive teacher attitudes; and a principal and staff committed to mainstreaming.

The reviewers' concern about the lack of a clear account of the study's methodological procedures, led them to question the validity and reliability of the conclusions and claims made by the authors. It obtained a low weight of evidence rating overall for addressing the review question (WoE D).

4.3.7 Zembylas and Isenbarger (2002) Teaching science to students with learning disabilities: subverting the myths of labeling through teachers' caring and enthusiasm

Based on an action research case study, involving a university researcher and a classroom teacher, this study sought to 'identify and describe the role of a teacher's caring and enthusiasm in an inclusive science classroom' (p 57) with particular reference to a single student who was diagnosed with attention deficit hyperactivity disorder (ADHD) and who at the start of the study was described as 'a social outcast to his peers' (p 64). The impetus for the study stemmed from the researchers' concern about the potential negative effects of labelling on students' learning. It offers an account of one student's personal confidence, enthusiasm for science and academic attainment in science in the light of the teacher's 'caring and enthusiastic' encouragement. The setting is an inclusive fourth-grade / fifth-grade classroom in the USA, having 24 students, 8 of whom had learning difficulties. The teacher used teaching approaches that sought to strengthen or create positive emotions. More specifically, she sought to reduce 'the use of labelling and stereotyping by activating students' talents and by having high expectations (p 75). The

study spanned two years, during which time the teacher (one of the authors) taught the same class of students.

The database consisted of the teacher's reflective journal, students' science work, including 'science binders' (which logged emotional and intellectual development in science), classroom tests and assignments, field notes and recordings taken in class, and the teacher's lesson planning.

On the basis of their account, the researchers conclude that, in so far as teachers cease to use labelling as a means of stereotyping students with special needs, it is more likely that teachers will view students as individuals with talents and strengths. They also claim that caring relationships, although not explicitly defined, among teacher-students are important, that activity-based curricula can be promoted, and that high expectations can be held for all students.

The reviewers expressed serious reservations about the reliability and validity of the data-collection and analytic processes, noting their lack of systematic and objective approaches and the inadequacy of measures to counter bias. The researchers relied heavily on their subjective perceptions and did not sufficiently explicate the processes they went through, all of which casts doubt on their claims. The reviewers allocated it a low weight of evidence rating overall for providing an answer to the review question (WoE D).

4.3.8 Trustworthiness of studies

Trustworthiness of the seven studies was judged by the reviewers through the application of EPPI-Centre data-extraction procedures. In relation to each study, reviewers independently considered and subsequently agreed their response to several questions about trustworthiness. One question, constituting weight of evidence A, asks: 'Taking account of all quality assessment issues, can the study findings be trusted in answering the study question(s)?' As shown in Table 4.6, five of the seven studies were allocated medium rating, two were allocated a low rating. No study was allocated a high rating for this aspect of trustworthiness.

4.3.10 Weight of evidence

Further types of 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 study (including 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 study provides to answer the question of the specific systematic review. As already noted, reviewers independently evaluated the studies against these criteria and moderated their judgements. The outcomes of this exercise are shown in Table 4.7; for clarity, this table also incorporates WoE A.

Of note here is that two of the seven studies (Palincsar et al., 2001; Wallace et al., 2002) were given a high to medium rating on each of two review-specific criteria. However, each was awarded an overall medium rating (WoE D). The latter rating takes into account the medium rating for WoE A. Two further studies (Jordan and Stanovich, 2001; Rieth et al., 2003) were rated medium across each area, while one study (Tindal and Nolet, 1996) was deemed low for WoE C, but scored medium for overall WoE D. In line with the trustworthiness data summarised in Table 4.6, two studies obtained a low rating for WoE, review-specific criteria and were deemed low overall (Ward and Center, 1999; Zembylas and Isenbarger, 2002).

Trustworthiness and weight of evidence ratings are taken into consideration when we synthesise the evidence from these studies. Before that, however, we chart the process from mapping to final synthesis.

Table 4.6: Weight of evidence A (WoE A, trustworthiness) (N = 7)

WoE A	Number	Studies (I
High	0	
Medium	5	Jordan and Stanovich (2001), Palincsar et al. (2001), Rieth et al. (2003), Tindal and Nolet (1996), Wallace et al. (2002)
Low	2	Ward and Center (1999), Zembylas and Isenbarger (2002)

Table 4.7: Weight of evidence ratings for individual elements for addressing the systematic review question

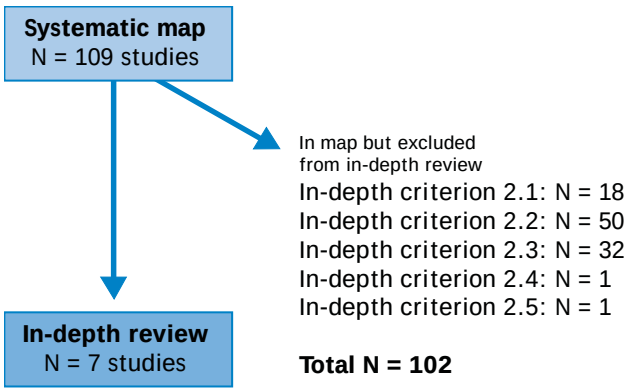
	Soundness of study in answering the study question(s) (WoE A)	Appropriateness of research design and analysis for addressing the systematic review question (WoE B)	Relevance of focus for addressing the systematic review question (WoE C)	Overall WoE for addressing the systematic review question (WoE D)
Jordan and Stanovich (2001)	Medium	Medium	Medium	Medium
Palincsar et al. (2001)	Medium	High/medium	High	Medium
Rieth et al. (2003)	Medium	Medium	Medium	Medium
Tindal and Nolet (1996)	Medium	Medium	Low	Medium
Wallace et al. (2002)	Medium	Medium/High	Medium/High	Medium
Ward and Center (1999)	Low	Low	Low	Low
Zembylas and Isenbarger (2002)	Low	Low	Low	Low

4.4 Final synthesis of studies

4.4.1 Process from mapping to final synthesis

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

Figure 4.1: From mapping to final synthesis



4.4.2 Approach to synthesis of evidence

As described in Chapter 2, the authors, in collaboration with members of the Review Group, agreed the approach to synthesising the evidence. The differences in foci and emphasis across the studies, together with the fact that most used mixed methods, meant that a meta-analysis of a statistical nature was not appropriate. However, a narrative thematic analysis was deemed appropriate and methodological, theoretical and empirical themes could be identified and described. We consider methodological issues first with reference to the scale of evidence available for answering our review question.

4.4.2.1 Methodological issues

As already evident from Table 4.9, two studies (Palincsar et al., 2001; Wallace et al., 2002) were deemed high for some weight of evidence criteria, although overall they both obtained a medium weight of evidence D by the reviewers. Three studies (Jordan and Stanovich, 2001; Rieth et al., 2003; Tindal and Nolet, 1996) were deemed of medium weight of evidence overall. These five studies all provide important evidence for answering the review question. Together they illuminate classroom interactions and pedagogical approaches in ways that are replicable. Moreover, classroom teachers could relate to the classroom settings described in these studies.

In the synthesis that follows, the weight of evidence allocated to the various studies is taken into account. This means that studies in which we have greater confidence, as revealed by the weight of evidence ratings, exert a greater influence in our synthesis and our recommendations for practice, policy and further research.

The seven studies in the in-depth review were quite heterogeneous and did not lend themselves to any pooling of data. They provide a patchwork of evidence with some accumulative dimension in so far as themes emerge from more than one study. The synthesis seeks to elicit common areas and provide trustworthy grounds for recommendations.

4.4.2.2 Synthesis of evidence

The review question requires evidence that will provide teachers and teacher educators with an understanding of the nature of classroom interactions that can influence the inclusion of pupils with special educational needs. The seven studies assembled here allow us to describe classroom interactions that are linked to outcomes for the inclusion of pupils with special educational needs in mainstream classrooms. They provide an evidential base for making recommendations about the kinds of interactions that could support inclusion and enhance the learning of all pupils.

The following four themes emerged from the studies synthesised for our review question:

(a) interaction and the mediating role of the teacher

(b) interaction, cognitive level and engagement

(c) interaction and the learner's voice

(d) interaction and knowledge as contextually-grounded

These themes are generic rather than related to pupils with particular kinds of special needs. All of them are relevant to our original subsidiary questions about the kinds of classroom environments that teachers create to enable all learners experience achievement.

A detailed knowledge of the studies chosen for the in-depth review, obtained from several close readings of the full texts of the studies as well as, of course, close attention to the data extracted in the EPPI-Centre process, enabled the authors to identify these themes. The specification and agreement of themes involved several meetings and discussions with the full Review Group. Our major concern in these meetings was to obtain the best possible fit between evidence and themes, and between evidence and wording to communicate the essence of the themes. Drafts were circulated among the author team and amendments, clarifications and refinements were made before the final version was deemed satisfactory.

(a) Interaction and the mediating role of the teacher

A common theme across all seven studies is the mediating role of the teacher in shaping interaction, and thereby the quality of learning, for all pupils, especially for pupils with special educational needs. The powerful role of the teacher to influence learning opportunities through interaction is evident, firstly in the design and execution of studies; secondly, in relation to the evidence made available on the link between interaction and academic and social inclusion; and thirdly, in relation to the teacher's own mindset.

With reference to the first point, Tindal and Nolet (1996, WoE: medium), for instance, based their study on the premise that verbal interactions, or more specifically the teacher's 'verbal presentations', are the primary means of instruction. In their study of guided inquiry, Palincsar et al. (2001, WoE: medium) refer to 'advanced teaching practices' (p 29) and the significance of teacher assistance. Ward and Center (1999, WoE D: low) wrote about teachers' 'instructional style'. Wallace et al. (2002) used the EBASS software to observe and investigate systematically teacher behaviour and interactional patterns. Moreover, Wallace et al. (2002) focused their study in schools and classrooms that were full and had success in including pupils with special educational needs(WoE D: medium). Six of the studies observed teacher interactions, while the one remaining study audio-recorded classroom interactions involving a direct focus on teachers' interactions (Jordan and Stanovich, 2001, WoE D: medium). An important theme and assumption underlying all these approaches is the power of the teacher to adapt teaching and learning for their pupils at the level of teacher-pupil interactions.

To the second point: the link between interaction and academic and social inclusion. It is clear that classroom interaction in which the teacher invites learners to problem-solve, to think, and to make connections with their own experiences and prior understandings are more successful than interactions that are procedural or heavily oriented towards classroom management. This link between the nature of interaction and pupil outcomes is either taken for granted in the studies, such that quantity and quality of teacher-pupil interaction itself is taken as indicative of success (e.g. Wallace et al., 2002) or it is empirically established (Jordan and Stanovich, 2001, WoE D: medium; Palincsar et al., 2001, WoE D: Medium). The issue is that the teacher is perceived to be a significant mediator between learners and what they need to know, understand, and be able to do.

Not only is the teacher important in terms of intervening through interaction in pupil learning, but the teacher's own pedagogical philosophy in relation to pupils with special educational needs is assumed to be significant and worthy of study in its own right. While the teacher's value system remains implicit in some studies (e.g. Palincsar et al., 2001, WoE D: medium; Rieth et al., 2003, WoE D: medium), it is explicit in others (Jordan and Stanovich, 2001, WoE D: medium; Ward and Center, 1999, WoE D: low; Zembylas and Isenbarger, 2002,

WoE D: low). It is evident that a teacher's positive attitudes towards inclusion is relevant to the successful inclusion of pupils with disabilities. To illustrate, Jordan and Stanovich (2001) showed how teachers differed in their conceptualisation of their roles and responsibilities in working with pupils with disabilities and that these differences are related to the quality of their interactional patterns with all pupils and, in turn, to their pupils' self-concept (WoE D: medium).

Teachers as powerful mediators, both in relation to what they do and how they interact, and in relation to how they think about their responsibilities vis-a-vis pupils with special educational needs, is a major theme emerging from the studies.

(b) Interaction, cognitive level and engagement

Across all the studies, there is clear recognition that classroom interaction matters and most studies provide insights into the nature of this interaction with reference to pupil outcomes. A key feature of several studies (Rieth et al., 2003; Jordan and Stanovich, 2001; Wallace et al., 2002, WoE: medium) is the analysis of both the quantity and quality of classroom interaction. Rieth et al. (2003), for instance, measured both the length and the level of teacher and pupil questions and answers, while Jordan and Stanovich (2001) probed three levels of classroom interactions: 'comprehension monitoring', 'cognitive extension' and 'non-academic interaction'. Wallace et al. (2002), also investigated interactions in relation to academic engagement and time spent in interaction with pupils.

Higher quality interaction (e.g. 'cognitive extension' in the case of Jordan and Stanovich, 2001) is characterised by questions and statements involving higher order thinking, reasoning, and implicating a point of view. There is evidence that having opportunities to engage in such higher order thinking fosters academic and social inclusion for all learners. In this sense, it is inappropriate (and probably impossible) to separate out academic and social inclusion in the context of interactional patterns. For instance, a positive and significant relationship was found by Jordan and Stanovich (2001, WoE D: medium) between teachers' higher cognitive interactions with pupils with disabilities and those same pupils' self-concept. In the work of Wallace et al. (2002, WoE D: medium), which is based on settings deemed successful in including pupils with special educational needs, the teachers engaged their learners in high level academic interaction and low levels of inappropriate (off-task) interactions and behaviours. That most of the available time was spent in interactions with learners is an important finding in the work of Wallace et al. and this is in line with the evidence from the research of Jordan and Stanovich (2001, WoE D: medium), Palincsar et al. (2001) and Reith et al. (2003).

Some studies went further than others in relation to what influenced the nature and amount of interaction, offering some insight into the contexts of such relationships, thus hinting at some possible explanations for success. As already noted, Palincsar et al. (2001) provided evidence that a guided inquiry approach to science teaching significantly enhanced the learning made by all pupils (WoE D: medium). Their study involved pupils in cycles of investigating, explaining, and reporting. The active role of the learner together with the nature and amount of assistance given to the learner by the teacher were important features of this successful context. Communication that engages the learner in the conventions of scientific reasoning emerged as important and the teacher role in modelling such conventions is paramount.

Similarly, Rieth et al. (2003, WoE D: medium) provide evidence of increased pupil participation and increased quality of interaction in the context of a teaching approach involving a problem situation to which pupils could relate and in which they could actively participate. 'Anchored instruction' is an approach where, in the authors' own words, pupils '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). This problem-solving context invited all pupils to engage more purposefully and at a higher cognitive level. As in the study by Palincsar et al. (2001), all pupils obtained much teacher assistance and attention.

In the section on the mediating role of the teacher, we noted the influence of teachers' pedagogical philosophy on their interactional practices and on their pupil outcomes. The nature of that influence, however, evidenced especially in Jordan and Stanovich (2001, WoE D: medium) provides further understanding of the conditions under which different interactional patterns may occur. Teachers who view themselves as responsible for fostering the learning of all their pupils promoted higher order interaction and engaged in prolonged interactions with pupils with special educational needs. Conversely, teachers who see others (e.g. specialist teachers or special education teachers) as primarily responsible for these pupils did not exhibit such interactional patterns and most of their interactions with these pupils were of a non-academic and low level nature. The evidence,

albeit far more limited, of Ward and Center (1999) and of Zembylas and Isenbarger (2002), supports the evidence on the connections between positive teacher beliefs and the quality of interaction.

Higher order interaction is of itself indicative of academic and social engagement and, as the synthesis table and earlier summaries show, higher order interaction is also linked to achievement as measured by assessments. Two features seem to be significant in supporting the incidence of higher order interaction: being in a problem-solving context and having teacher assistance. Furthermore, the pedagogical philosophy of the teacher is important. The low numbers of participants involved in these studies, however, suggest the need for tentativeness in making these claims.

(c) Interaction and the learner's voice

Arguably any study about classroom interaction will inevitably involve consideration of the learner's participation in that interaction and therefore this heading might be deemed unremarkable. However, the notion of the learner's voice suggests an explicit and conscious focus on the learner's world and the learner's (sometimes unique) understanding of that world. The theme of the learner's voice emerges explicitly from five of the seven studies in the in-depth review, as indicated in the synthesis table and in the summaries.

The notion of the learner's voice is strongly evident in the work of Palincsar et al. (2001) and of Rieth et al. (2003, WoE D: medium). To illustrate, a key characteristic of the 'advanced teaching practices' applied in the second phase of the study by Palincsar et al. (2001) is 'access'. This incorporates access of the teacher and peers to the thinking and reasoning of pupils with special educational needs (i.e. the primary participants and the major focus of the research). Their work showed that pupils with special educational needs participated more fully when helped to document their thoughts and that one-to-one discussion with the teacher helped them to maximise their learning engagement. Knowing what the learner thinks is considered of major importance in this study and was something that strategies like 'rehearsing' and 'mini-conferencing' sought to elicit. Moreover, monitoring learner thinking constituted a vital element of advanced teaching practice implemented in the study.

To a lesser extent, in terms of emphasis and weight of evidence, the work of Tindal and Nolet (1996, WoE D: medium) and Zembylas and Isenbarger (2002, WoE D: low) attend explicitly to the learner's voice. The former refers to the use of 'probes' at intervals during lessons in order to determine the learner's perception of events in the lesson (as distinct from comprehension), while in the latter, action research study was based on the importance of the learner's voice and the inadequacy of labels for understanding what children with special educational needs are capable of learning. Like the study by Palincsar et al.(2001), in which teachers were impressed by what the pupils with special educational needs revealed about their thinking and conceptual understanding, Zembylas and Isenbarger (2002)were struck by the scientific understanding of one child when teacher attention shifted from his labelling to his responses and engagement in scientific inquiry.

Finally, the research approach in the work of Jordan and Stanovich (2001, WoE: medium) focused explicitly on how interaction incorporated the learner's voice. With reference to what the researchers termed 'full cognitive extension' (p 39), evidence was sought of how the teachers calibrated their questions and statements in accordance with the pupil responses. These interactions involved following 'the pupil's lead' rather than merely checking understanding.

Overall, most of the studies assembled recognise that, for learning to occur, the learner's view of what is salient is key and that interactional practices need to reflect this.

(d) Interaction and knowledge as contextually-grounded

Interaction in relation to contextually-grounded knowledge is a theme emerging from three studies (Palincsar et al., 2001; Rieth et al., 2003; Zembylas and Isenbarger, 2002). Contextually-grounded knowledge refers to the way in which is to be learned is grounded in the learners' experiences, connects with authentic activity, and is perceived as meaningful to learners in the here and now of their lives. Palincsar et al. (2001, WoE: medium) exemplify this best in their inquiry-based science instruction. Here, interaction takes place in the course of activities that are authentic to the nature of scientific practice and that engage learners in 'first-hand investigations', involving directly experiencing and studying phenomena for the purpose of constructing claims about the nature of the physical world. In their study, knowledge is also viewed as 'distributed' in the sense of its possession by the group, pair and so on, rather than merely the possession of the single individual. The study of anchored instruction by Rieth et al.(2003) showed how learners are expected to use their knowledge to solve realistic problems and they are provided with multiple opportunities to

Table 4.8: Synthesis of evidence

Foci of information about interaction	Studies (Curriculum area)	Outcomes Measured	Outcomes/Relationships (WoE:D)	Emerging themes on interaction
Teacher beliefs	Jordan and Stanovich (2001) (Language Arts, Mathematics, Science)	Pupil self-concept, teacher beliefs, classroom interaction	Teacher beliefs related to differences in their interaction patterns for all pupils. INT teachers had more prolonged interactions at higher cognitive level with SEN. Different interactional patterns and beliefs are related to student self-concept; students (+SEN) of INT teachers scored higher on self-concept. (Medium)	(a) Mediating role of teacher (b) Cognitive level and engagement (c) Learner voice
Guided inquiry	Palincsar et al. (2001) (Science)	Reading skill, science concepts, attitudes re. science	Significant learning gains were made by all students. Participation of SEN was influenced by the nature and amount of assistance received. SEN found it difficult to learn from large-group discussions without support. One-to-one discussion with the teacher helped to maximise engagement. (Medium)	(a) Mediating role of teacher (b) Cognitive level and engagement (c) Learner voice (d) Knowledge as contextually-grounded
Anchored Instruction	Rieth et al. (2003) (Literature)	Length and quality of teacher and pupil interaction	Student participation, attention to task, and understanding of content all increased. Quantity and quality of high level interaction rose. More thought-provoking questions from the teacher led to more thoughtful responses from students. (Medium)	(a) Mediating role of teacher (b) Cognitive level and engagement (c) Learner voice (d) Knowledge as contextually-grounded
Alignment with curriculum and assessment	Tindal and Nolet (1996) (Science)	Student perceptions of lesson concepts, knowledge of the specific science taught, content/focus of classroom interaction	Verbal instruction and textbook concepts were aligned. Information in content classes was not of equal value and this was not always obvious to pupils with SEN. (Medium)	(a) Mediating role of teacher (b) Cognitive level and engagement (c) Learner voice

Table 4.8: Synthesis of evidence continued

Foci of information about interaction	Studies (Curriculum area)	Outcomes Measured	Outcomes/Relationships (WoE:D)	Emerging themes on interaction
Teachers nominated as successful	Wallace et al. (2002) (Range)	Academic, task management, and competing responses of students academic, discipline management (teachers)	High level academic engagement and low level inappropropriate behavior for all; no significant differences in the behaviour of students with and without disabilities; more than 75% of time spent instructing, managing and interacting with their students; students with disabilities were more often the focus of their teachers' attention than students without disabilities. (Medium)	(a) Mediating role of teacher (b) Cognitive level and engagement (c) Learner voice
Educational experiences of students with disabilities	Ward and Center (1999) (Range)	Academic success, Engagement, curriculum modification	Factors contributing to inclusion: modifications to the curriculum; use of structured teaching strategies; availability of trained support staff; a supportive school policy; positive teacher and school attitudes. (Low)	(a) Mediating role of teacher (b) Cognitive level and engagement
Care and enthusiasm	Zembylas and Isenbarger (2002) (Science)	Academic success, engagement	Importance of caring relationships (Low)	(a) Mediating role of teacher (b) Cognitive level and engagement (c) Learner voice (d) Knowledge as contextually-grounded

interact and to form 'communities to help each other learn' (p 174), while solving their identified problems. The notion of knowledge as distributed is not a feature of the work of Zembylas and Isenbarger (2002, WoE: low), but the idea of knowledge as contextually-grounded is. Here the teacher prompts, hints and invites higher order thinking through engagement with one pupil with special educational needs.

The high level of higher order thinking and interaction in both guided inquiry science and anchored instruction would suggest that contextualising what is to be learned in the form of inquiry and problems has the potential to foster academic and social inclusion of pupils with special educational needs.

In short, the evidence base has the potential to inform teachers about approaches to interaction that promote inclusion of pupils with special educational needs.

Table 4.8 summarises the foci of information about interaction, the curriculum areas, the outcomes measured, the nature of relationships and outcomes, and the themes emerging from each study included in the final synthesis of evidence.

4.5 In-depth review: quality-assurance results

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

Overall, there was very 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.

One issue which involved moderation discussion was interpretation of what constituted an evaluation occurring naturally, and what constituted a researcher-manipulated evaluation. Careful scrutiny of the studies resolved these issues where they occurred. There was also very close agreement between the data-extraction of two Review Group members and that of our EPPI-Centre colleague who also data-extracted two of the seven studies. Areas of initial disagreement related to ratings of overall weight of evidence and discriminating naturally-occurring from researcher-manipulated evaluations. Discussion led to clarification, consensus and an agreed response to the items, where there had been some initial misalignment. Apart from these specific issues, there was very high agreement, both between the internal reviewers and between internal and EPPI-Centre colleagues, about 'weight of evidence'.

4.6 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. As explained there, actual involvement of users consisted mostly of individual replies to correspondence by letter and email. In addition, members of the Review Group had several conversations about the review with practising teachers, teachers in training, members of teacher support teams and psychological services employed by local education authorities, colleagues working in teacher training and teacher professional development. They discussed various aspects with these interested colleagues, specifically the formulation of the review focus, the criteria for selecting studies, and the focus of the in-depth review.

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

While evidence of impact is not available to us at the time of preparing this report, we are aware that our colleagues are already disseminating the results of the review to their students. In addition, two presentations were given at international conferences in August and September 2005.

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

4.7 Summary of results of synthesis

In seeking to extract a manageable subset from the 109 studies in the descriptive map that would be of maximum interest to prospective and practising teachers we sought further advice from our Advisory Group. The nature of the interactive approaches, together with the social and academic outcomes for pupils, emerged as a worthy focus of investigation from the full Review Group.

New inclusion/exclusion criteria were then applied and seven studies emerged from the descriptive map for in-depth review. Each of the seven 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.

The seven 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 and more particularly the diversity of research techniques and measures mean that, as a group, they did not lend themselves to a statistical synthesis. More specifically, the evidence made available through the studies was not of a quantitative nature that would allow the conduct of a meta analysis. 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.

No study obtained a high weight of evidence overall for addressing the systematic review question (see Table 4.9, WoE D). This was the first methodological concern for us 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, five of the seven studies scored medium for overall weight of evidence for addressing the systematic review question (WoE D): Jordan and Stanovich (2001), Palincsar et al. (2003), Rieth et al.(2003), Wallace et al.(2002) and Tindal and Nolet (1996).Two studies (Ward and Center, 1999; Zembylas and Isenbarger, 2002)

scored low for overall weight of evidence for addressing the review question. Our conclusion is that there is reason to have confidence in the evidence collected in these studies, but that generalisation over a larger population may be more problematic.

Our question is about gaining insights into how teachers facilitate inclusion of pupils with special educational needs through their pedagogical interactions. More specifically, we were interested in providing teachers and their educators with an understanding of the nature of classroom interactions that can influence the inclusion of pupils with special educational needs. We have evidence, albeit limited, about the nature of interactions in pedagogical approaches, linked to outcomes, for the academic and social inclusion of pupils with special educational needs. The findings of the review offer some scope for making tentative recommendations.

Substantive themes on interaction

Four important inter-related themes emerged in the synthesis. The first substantive theme to emerge from all seven studies was the powerful role of the teacher to influence learning opportunities through interaction. This was evident first, in the design and execution of studies; second, in relation to the evidence made available on the link between interaction and academic and social inclusion; and third, in relation to the teacher's own mindset. A major finding of this review was the power of teachers as powerful mediators, both in relation to what they do and how they interact, and in relation to how they think about their responsibilities about pupils with special educational needs.

We identified the second theme as cognitive level and engagement. This theme is also based on all seven studies. There is evidence that having opportunities to engage in higher order thinking fosters academic and social inclusion of all learners. Classroom interactions – in which the teacher invites learners to problem-solve, to think, and to make connections with their own experiences and prior understandings – have a more positive impact than interactions that are procedural and oriented merely towards classroom management. While higher order interaction is itself indicative of academic and social engagement, it is also associated with achievement as measured by assessments. In short, the review identified two features as being important in supporting the incidence of higher order interaction for pupils with special educational needs: being in a problem-solving context and having teacher assistance.

A third theme is the learner's voice and this arises from six of the studies. The notion of the learner's voice suggests an explicit and conscious focus on the learner's world and the learner's unique understanding of that world. Teacher interactions that would reflect this are interactions that take account of, and build on, the pupil's responses. The studies assembled indicate that, for academic and social inclusion to occur, the learner's view of what is salient is key and that interactional patterns need to reflect this.

The fourth theme identified is knowledge or, more specifically, knowledge as contextually-grounded. This refers to the way in which what is to be learned is grounded in the learners' experiences, connects with authentic activity, and is perceived as meaningful to learners in the here and now of their lives. This was a theme emerging from three of the studies. The evidence shows that contextualising what is to be learned in the form of inquiry and problems has the potential to foster academic and social inclusion of pupils with special educational needs.

CHAPTER FIVE

Findings and implications

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 the interactions in pedagogical approaches with reported outcomes for pupils with special educational needs. Our aim was to examine the evidence from which useful findings, conclusions and implications relevant to the TDA might be derived. This chapter summarises the systematic review journey together with the major substantial and methodological findings. It considers the strengths and limitations of the review and it 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 with the first systematic review (Nind et al., 2004), the usefulness of seeking to answer the overall question and the refined question for the in-depth review was frequently reiterated by the Advisory Group. The way the question is formulated reflects discussion with practitioners and their concern with real-world contexts, as well as discussion with colleagues at the EPPI-Centre who guided its precise wording. Using specific inclusion and exclusion criteria, we have systematically assembled those studies pertaining to teaching approaches that can be conducted by the mainstream teacher without additional specialist teacher presence.

The review also encompasses studies of pupils with special educational needs in the context of core curriculum areas: literacy (e.g. Rieth et al., 2003), mathematics (e.g. Jordan and Stanovich, 2001), and science (e.g. Palincsar et al. 2001). It also included studies that represented the phases of schooling: four from a primary school, three from a secondary school and one from a middle school.

There was high quality-assurance for the review: screening, data-extraction and quality assessment were conducted by two independent Review Group members (or a Review Group member and EPPI-Centre link person) at each stage. In addition to good quality-assurance, confidence in the review findings is strengthened by the quality of the majority of the studies. Four of the studies were deemed at least 'medium' for all weights of evidence (A, B, C and D) (see Table 4.8).

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

The scope of this systematic literature review inevitably had limitations. Due to the way in which the review was set up, as in the first year, no material before 1994 was included. Similarly, it did 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 year, 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. The majority of the studies (5) were USA-based and no study was based in the UK, thus having obvious difficulties for generalising to the situation in the UK. Another limitation concerns the strength of the evidence base overall and the limited number of participants within the various studies. We caution against generalising.

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.

On balance, it must be recognised that conclusions are drawn from a limited research base. It may be that other review questions based on other selection criteria, incorporating different inclusion and exclusion criteria, would also offer insights into how to effectively teach children with special educational needs in mainstream classrooms in ways that benefit the academic and social inclusion of all children.

5.2 Implications

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

5.2.1 Policy

Policy-makers should be aware that, overall, there is a shortage of evidence about the nature of teaching approaches that effectively include children with special educational needs in mainstream classrooms. There is also a shortage of evidence about teachers working alone within inclusive settings. They should be aware, in particular, of the dearth of evidence in England on interactions within pedagogical approaches that are linked to outcomes on social and academic inclusion for pupils with special educational needs. There is, however, some evidence about the nature of interactions within pedagogical approaches and policy should encourage teachers to adopt such approaches.

The significant role of the teacher in facilitating effective inclusion through appropriate interaction in the classroom needs to be communicated to, and recognised by, all those involved in supporting the learning of pupils with SEN. Taking account of the learner's responses and understandings as well as framing what is to be learned in terms of meaningful problems for the learner are practices that require critical awareness and skill. It would be important for policy-makers to ensure that the necessary in-service training and continuing professional development is available for the development of such knowledge and competence. A range of recent research and official reports have given consistent messages about the use of teaching assistants (e.g. Ofsted, 2004). According to Ofsted, well managed and well trained teaching assistants can have a positive impact on the attention given to groups and individuals, on ethos and attitudes, and on standards. In light of the increasing involvement of teaching assistants, it would be important also for policy-makers to ensure that this group of supporting adults, along with teachers, have opportunities to study, consider and apply the available knowledge about effective interactional practices. This is especially important in the context of their particular close involvement with pupils with special educational needs.

It should also be disseminated to teacher educators across provision at primary and secondary levels that the existing research base offers an account of the nature of interaction that is associated with outcomes for the inclusion of pupils with special educational needs in mainstream classrooms. It is also important that it is shared with special needs advisers, inclusion advisers and Ofsted inspectors.

5.2.2 Practice

According to the research evidence on the nature of interactions that can include pupils with special educational needs, there is a set of practices and beliefs clustering around the following themes: the mediating role of the teacher, cognitive level and engagement, the learner's voice, and knowledge as contextually-grounded. Pedagogical approaches, and more precisely interactional approaches, that

include children with special educational needs cannot be reduced to simplistic formulae. Given the complex nature of inclusive pedagogy, teachers in training would need opportunities to reflect on their practices in the light of the themes identified here. Case study material and exemplification material would be useful supports for teacher educators in promoting the kind of classroom interaction that would maximise inclusion of pupils with special educational needs.

Encouraging the use of interactional patterns in classrooms that are in line with the findings of this review implies an acknowledgement of a constructivist view of learning. This view holds that learners construct knowledge and understanding when they are actively contributing to the interaction and when their prior knowledge is used as a basis on which to build new learning, represented in the synthesis by the notion of the learner's voice. The studies in this review showed how teachers drew on learners' prior, and sometimes out-of-school, experiences to make learning accessible and meaningful. The mediation of the teacher in this kind of interaction involves inviting, listening to and building on the learners' responses; posing questions and statements that invite learners to reflect on their understanding and their experiences; and creating a classroom environment in which learners are expected to have and to express ideas. The cognitive level of this kind of interaction is high in that it challenges learners' thinking by getting them to speculate and hypothesise, as exemplified in the study by Palincsar et al. (2001) about making science accessible. In building on what children bring to their learning in terms of their experiences and ideas, this kind of interaction is contextually grounded. The implication here is to see all learners, including teachers and school administrators, as having active agency in learning and, therefore, to acknowledge the importance of the teacher as a reflective practitioner (Schön, 1983) and the school itself as a site of reflective practice to take account of this view.

It is also likely that leadership from informed and committed headteachers (Ofsted, 2004) would be needed together with a clear priority on interactional patterns found by this work to be supportive of the academic and social inclusion of pupils with special educational. The training and careful deployment of teaching assistants in relation to appropriate styles of interaction would make for an environment conducive to inclusion. The challenge for schools in trying to increase the incidence of higher-order interaction and interaction that tunes in learners' thinking might be in convincing some practitioners of the value of shifting their own mindsets from a notion of learning as transmission (in which classroom interaction is dominated by teacher talk and 'telling') to a notion of learners building their own knowledge in which classroom interaction is based on dialogue between practitioners and learners, and between learners themselves. Practitioners need opportunities to consider and reflect upon these fundamental ideas about learning and the process of coming to know, ideas, which arguably, are particularly salient in the context of children who find school learning difficult.

5.3.3 Research

The implications for research are also in keeping with the points we made in the first year. In general, rigorously designed research to evaluate teaching approaches to include children with SEN in mainstream classrooms is needed in the English context. There is a need too for research involving signed and tactile interactions in the mainstream, and teachers working alone in inclusive contexts. More particularly, studies focused on classroom interaction will be needed to establish how and with what effects teachers include pupils with special educational needs. The small sample sizes involved to date mean that research and development projects would be useful in order to explore the issues involved in applying the findings emerging from this review. There is a need for research in the UK that investigates classroom interaction in the context of social and academic outcomes for pupils with SEN. In this regard, consideration should be given to indicators of pupil progress that are rich and varied, and not merely confined to the easily measurable. The most methodologically robust study in the review (Palincsar et al., 2001) examined academic, social and other outcomes, and their interrelationship, thus directing us to multifaceted approaches that seem to work on a number of levels in real world contexts. It is somewhat artificial to study classroom pedagogy separate from school ethos and research addressing how the two relate would be valuable.

While the evidence available bears on core curriculum areas of literacy, mathematics and science, there is a gap in terms of other curriculum areas. Other teaching approaches contained within the descriptive map of this review, such as collaborative teaching, warrant further systemic study and in-depth review. This is especially pertinent now in the context of workforce reform and the increasing involvement of other adults, especially teaching assistants, in the promotion of learning in the classroom. Immediate attention might also usefully be given to the 70 studies that could not be retrieved in time for inclusion in this review.

References

6.1 Studies included in map and synthesis

Studies in **bold** were selected for in-depth review.

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APPENDIX 1.1

Advisory Group membership

International Advisers

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

User Group Advisers

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

Review Team Members

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

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.

Janet Collins's 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.

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

Kathy Hall is Professor of Education at the Open University where she researches in the areas of literacy, inclusive schooling, assessment and rural childhoods. She currently directs (with Jon Tan) a longitudinal evaluation of a reading intervention programme for under-achieving pupils in early secondary education. She has led several research reviews, including one TDA-funded systematic review of research evidence on literacy teaching.

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.

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.

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.

Jon Tan specialises in evaluative education and policy research. He was principal researcher for the 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.

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.

APPENDIX 2.1

Inclusion and exclusion criteria

Map inclusion/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

In-depth inclusion/exclusion criteria

The in-depth review *included* those studies that met *all* the following criteria:

- had a focus on teaching and learning
- had a focus on outcomes for the academic achievement and social inclusion of pupils with special educational needs (SEN)
- were focused on mainstream classroom teachers
- were based on exploration of relationships or were evaluations

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

- did not have a focus on teaching and learning
- did not have a focus on outcomes for the academic achievement and social inclusion of pupils with SEN
- had a focus on a collaborative teaching approach
- had a focus on programmatic interactions
- were not based upon exploration of relationships or evaluations

APPENDIX 2.2

Search strategy for electronic bibliographic databases

Keywords based on ERIC subject headings

Terms for special educational needs

special educational needs or special education or special educational program

disabilities

Terms for inclusion/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

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

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

Record of specific searches of each bibliographic databases

ArticleFirst: Search strategy

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

(kw: mainstreaming
or (kw: inclusive and kw: education))
and (kw: disabilit*
or kw: special w education* w need*
or kw: special w need*
or kw: learning w difficult*)
not (kw: nursery

or kw: preschool*
or kw: kindergarten
or kw: early w year*
or kw: early w childhood
or kw: further w education
or kw: higher w education
or kw: universit*
or kw: adult*
or kw: adolescent*
or kw: policy
or kw: law
or kw: regulation*
or kw: legislation)

Australian Education Index (AEI): Search strategy

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

Search: (14 term(s)

Year of Publication=("1994" OR "1995" OR "1996" OR "1997" OR "1998" OR "...
AND 2 term(s): AEI Subject Headings=("SPECIAL NEEDS CHILDREN"
OR "SPECIAL NEEDS STUDENTS...
OR 2 term(s): AEI Subject Headings=("LEARNING DIFFICULTIES"
OR "LEARNING DISABILITIES")
OR 1 term(s): AEI Subject Headings=("DISABILITIES")
AND 2 term(s): AEI Subject Headings=("INCLUSIVE EDUCATION"
OR "INCLUSIVE SCHOOLS")
OR 1 term(s): AEI Subject Headings=("MAINSTREAMING"))
NOT NURSERY
NOT (EARLY CHILDHOOD)
NOT KINDERGARTEN
NOT ADULT?
NOT PRESCHOOL
NOT UNIVERSIT?
NOT (FURTHER EDUCATION)
NOT (HIGHER EDUCATION)
NOT LAW
NOT REGULATION?
NOT LEGISLATION

British Educational Index: Search strategy

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

(Year of Publication=1994
OR 1995
OR 1996
OR 1997
OR 1998
OR 1999
OR 2000
OR 2001
OR 2002
OR 2003)
AND (((BEI Subject Headings=SPECIAL EDUCATIONAL NEEDS
OR SPECIAL EDUCATIONAL NEEDS'
OR CHILDREN WITH SPECIAL EDUCATIONAL NEEDS
OR PUPILS WITH SPECIAL EDUCATIONAL NEEDS)
AND ((BEI Subject Headings=INCLUSIVE EDUCATION)
OR ((BEI Subject Headings=MAINSTREAMING)))))
NOT POLICY
NOT UNIVERSITY
NOT (EARLY YEARS)
NOT (EARLY CHILDHOOD)
NOT (HIGHER EDUCATION)
NOT (FURTHER EDUCATION)
NOT PRESCHOOL
NOT LAW
NOT LEGISLATION

ERIC: Search strategy

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

(Publication year=1994
OR 1995
OR 1996
OR 1997
OR 1998
OR 1999
OR 2000
OR 2001
OR 2002
OR 2003)
AND (((ERIC Subject Headings=SPECIAL NEEDS CHILDREN
OR SPECIAL NEEDS STUDENTS)
OR ((ERIC Subject Headings=LEARNING DISABILITIES)
OR ((ERIC Subject Headings=DISABILITIES))) AND ((ERIC Subject Headings=INCLUSION (EDUCATION)
OR CLASS INCLUSION
OR INCLUSIVE EDUCATION
OR INCLUSIVE EDUCATION PROGRAMS)
OR ((ERIC Subject Headings=MAINSTREAMING))
AND ((Document Type=INFORMATION ANALYSIS (070))
OR ((Document Type=ERIC DIGESTS IN FULL TEXT (073))
OR ((Document Type=REPORTS--DESCRIPTIVE (141)
OR REPORTS--EVALUATIVE (142)
OR REPORTS--GENERAL (140)
OR REPORTS--RESEARCH (143))
OR ((Document Type=DISSERTATIONS/THESES (040)

OR DISSERTATIONS/THESES--DOCTORAL DISSERTATIONS
OR DISSERTATIONS/THESES--MASTERS DISSERTATIONS (0)
OR DISSERTATIONS/THESES--PRACTICUM PAPERS (043)
OR ((Document Type=JOURNAL ARTICLES (080))
OR ((Document Type=BOOK (010))))))
NOT (EARLY CHILDHOOD)
NOT (HIGHER EDUCATION)
NOT POLICY)
NOT PRESCHOOL
NOT ADULT?
NOT ADOLESCENT?
NOT LEGISLATION?
NOT POLICY NOT Q-W-0)))))
NOT LEGISLATION

Dissertation Abstracts: Search strategy

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

KEY(mainstreaming
or inclusive education
or inclusive school*)
and KEY(curriculum
or teaching practice*
or teaching method*)
and DATE(>=1994)
and DATE(<=2003)
NOT KEY(policy
or law
or regulation* legislation)

ECO: Search strategy

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

(kw: mainstreaming
or (kw: inclusive
and kw: education))
and (kw: disabilit*
or kw: special w education* w need*
or kw: special w need*
or kw: learning w difficult*)
not (kw: nursery
or kw: preschool*
or kw: kindergarten
or kw: early w year*
or kw: early w childhood
or kw: further w education
or kw: higher w education
or kw: universit*
or kw: adult*
or kw: adolescent*
or kw: policy
or kw: law
or kw: regulation*
or kw: legislation)

PaperFirst: Search strategy

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

or kw: legislation)

(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*

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**)*

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 & 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

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 (1309)

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 *www.nasen.org.uk*

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

Down Syndrome Organisation *www.downs-syndrome.org.uk*

Mencap *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)
. . . . . .

A2. Status
Published
In press
Unpublished

A3. Linked reports
Is this report linked to one or more other reports in such a way that they also report the same study?
Not linked
Linked (please provide bibliographical details and/or unique identifier)
. . . . . .
. . . . . .
. . . . . .
. . . . . .

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) . . . . . .

A7. Curriculum
Art
Business studies
Citizenship
Cross-curricular
Design and technology
Environment
General
Geography
Hidden
History
ICT
Literacy – first language
Literacy further languages
Literature
Mathematics
Music
PSE
Physical education
Religious education
Science
Vocational
Other (please specify) . . . . . .

A8. Programme name (please specify)
. . . . . .

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) . . . . . .

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

Review-specific keywording

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 assisant
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

(Records for two studies identified in 2004 were lost from the database.)

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

Agran M, Blanchard C, Wehmeyer M, Huges C (2001) Teaching students to self-regulate their behavior: the differential effects of students vs. teacher-delivered reinforcement. *Research in Developmental Disabilities* **22:** 319–332.

Ashton TM (1999) Spell checking: making writing meaningful in the inclusive classroom. *TEACHING Exceptional Children* **32:** 24–27.

Bailey S (1997) David: a study in integration. *British Journal of Physical Education* **28:** 17–18.

Baxter J, Woodward J, Wong J, Voorhies J (2002) We talk about it, but do they get it? *Learning Disabilities: Research Practice* **17:** 173–185.

Bishop ME (1995) Inclusion: balancing the ups and downs. *Momentum* **26:** 28–30.

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

Clark SG (2000) The IEP process as a tool for collaboration. *Teaching Exceptional Children* **33:** 56–66.

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.

Daly T (2001) Pedagogy and disability: insights from action. *Irish Educational Studies* **20:** 107–124.

De Lemos MM (1994) *Schooling for Students with Disabilities*. Department of Employment, Education and Training, AGPS, Canberra.

Demchak MA (1995) *Implementing Inclusive Education for Students with Severe Disabilities in a Rural Elementary School.* American Association on Mental Retardation, San Francisco, CA.

Din FS (1996) A field test of a full inclusion project. Paper presented at the Center for the Study of Small/Rural Schools Creating the Quality School Conference. Oklahoma City, OK: 28–30 March.

Douglas T (1997) Moving towards a postmodern liberatory pedagogy in special education: one school district's beginning. University of Tasmania. Medical thesis.

Dyck N, Sundbye N, Pemberton J (1997) A recipe for efficient co-teaching. *Teaching Exceptional Children* **30:** 42–45.

Eldred JR (1998) Evaluation of an inclusive education program for elementary school special education students. Central Michigan University. PhD thesis.

Ellery P (1995) Peer tutors work. *Strategies* **8:** 12–14.

Evers RB (1995) Effective teaching practices in a mainstream vocational education setting. *LD Forum* **20:** 34–37.

Falk-Ross F (2000). Finding the right words: a case study in classroom-based language and literacy support. *Research in the Teaching of English* **34:** 499–531.

Farmer S (1996) Finding Amy's voice: a case for inclusion. *Voices from the Middle* **3:** 27–31. (Not available)

Ferranti J (1997) Finding a common ground: special and general education. *Primary Voices K-6* **5:** 30–34. (Not available)

Fields BA (1999) The impact of class heterogeneity on students with learning disabilities. *Australian Journal of Learning Disabilities* **4:** 11–16.

Gaunty-Porter DC (1999) Building a literate community in one second-grade classroom: through the teacher's eyes. PhD thesis. State University of New York at Albany.

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.

Gross AL, Ortiz LW (1994) Using children's literature to facilitate inclusion in kindergarten and primary grades. *Young Children* **49:** 32–35.

Gunsalus CC (1999) The effect of choice on on-task behavior with two middle school students with learning disabilities in an inclusionary setting. PhD thesis. Ball State University.

Habedank LK (1994) The effects of reintegrating students with mild disabilities in reading. PhD thesis. University of Oregon.

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.

Holmes JA (1999) The least restrictive environment: is inclusion best for all special needs students? Paper presented at the Annual Meeting of the Mid-South Educational Research Association. Point Clear, Alabama: November 17–19. (ERIC Report ED437760)

Hoyt L, Ames C (1997) Letting the learner lead the way. *Primary Voices K-6* **5:** 16–29. (Not available)

Hrekow P, Barrow G (1994) Supporting pupils with special educational needs in the mainstream setting: methods and approaches. *Pastoral Care in Education* **12:** 26–30.

Janney RE, Snell ME(1997). How teachers include students with moderate and severe disabilities in elementary classes: the means and meaning of inclusion. *Journal of the Association for Persons with Severe Handicaps* **22:** 159–169.

Kiernan W (2001) Directed Research Project: Integrating Curriculum for All Students, 1 October 1998 – 30 September 2001. Final Report: 166.

Johnson RR, Test DW, Algozzine B (1995) Special education in general education classrooms: cooperative teaching using supportive learning activities. *Special Services in the Schools* **10:** 25–43.

Kaczmarcik PM (1996) Inclusion: perceived problems and possibilities for secondary administrators (mainstreaming). Widener University. EdD thesis.

Kelly P (1995) Effectiveness of integrating exceptional children into a junior secondary coeducational Catholic school. MEd thesis. Australian Catholic University, Queensland.

Kline SA (1994) Interventions that facilitate the inclusion of children with special needs. PhD thesis. University of Kansas.

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.

Knight BA, Graham L, Hughes D (1995) Fostering the acceptance of students with learning disabilities in the regular classroom: a challenge in the United Nations' international year of tolerance. *Australian Journal of Remedial Education* **27:** 6–12.

Long PC (1994) Quality outcomes for all learners. Selected papers from the Australian Association of Special Education 17th National Conference. Melbourne, Australian Association of Special Education (AASE).

McKeown S, Stevens C (2000) Special education needs (SEN) and information and communications technology (ICT) – supporting inclusion. *Learning Resources Journal* **16:** 45–48.

Meinbach AM (1999) Seeking the light: welcoming a visually impaired student. *Middle School Journal* **31:** 10–17.

Monkman H, Baskind S (1998) Are assistants effectively supporting hearing-impaired children in mainstream schools? *Deafness & Education* **22:** 15–22.

Montgomery JK (1994) Selected strategies for inclusive classrooms. School reform and special educational needs conference. University of Cambridge Institute of Education.

Morocco CC, Walker A, Lewis LR (2003). Access to a schoolwide thinking curriculum: leadership challenges and solutions. *Journal of Special Education Leadership* **16:** 5–14.

Nelson NW, Bahr CM, Van Meter A (2002). Writing Lab Outreach Project, 1 September 1998 – 31 August 2002. Outreach Projects for Children with Disabilities. Final Performance Report, Western Michigan University, Kalamazoo College of Education: 71.

Noble T, McGrath H (1994) An integration program: different kids, same classroom. In: Long PC (ed.) *Quality Outcomes for all Learners*. Selected papers from the Australian Association of Special Education: 17th National Conference. Melbourne, Australian Association of Special Education (AASE).

OECD (1999) *Inclusive Education at Work: Students with Disabilities in Mainstream Schools*. Paris, OECD.

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.

Parker MA, Schuster JW (2002) Effectiveness of simultaneous prompting on the acquisition of observational and instructive feedback stimuli when teaching a heterogeneous group of high school students. *Education and Training in Mental Retardation and Developmental Disabilities* **37:** 89–104.

Potter A, Rushton M (1998) Evaluation of a bilingual-bicultural educational program for deaf and hearing grade two students. *Australian Journal of Education of the Deaf* **4:** 41–48.

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

Pritchard C, Vincent S (1994) The use of co-operative learning as an effective tool to integrate a class of multiply disabled children into a mainstream unit. *Partnerships in teaching and learning : Australian Association of Special Education 18th National Conference, 30 September – 3 October 1994: papers and presentations'. {Buranda Qld}: Australian Association of Special Education (AASE)*. (Not available)

Rafferty CD, Leinenbach M, Helms L (1999) Leveling the playing field through active engagement. *Middle School Journal* **30:** 51–56.

Rosman NJS (1994) Effects of varying the special educator's role within an algebra class on math attitude and achievement. MA thesis. University of South Dakota.

Scanlon D, Deshler DD, Schumaker JB (1996). Can a strategy be taught and learned in secondary inclusive classrooms? *Learning Disabilities Research and Practice* **11:** 41–57.

Shipway K, Nehrmann L (1994) Maintaining students with special educational needs in regular schools: the Derwent District Support Team. In: Long PC (ed.) *Quality Outcomes For All Learners*. Selected papers from the Australian Association of Special Education: 17th National Conference, Melbourne, Australian Association of Special Education (AASE).

Smith A (2004) The inclusion of pupils with special educational needs in secondary school physical education. *Physical Education and Sport Pedagogy* **9:** 37–54.

Staub D, Spaulding M, Peck CA, Gallucci C, Schwartz IS (1996) Using nondisabled peers to support the inclusion of students with disabilities at the junior high school level. *Journal of the Association for Persons with Severe Handicaps* **21:** 194–205.

Stone CA (1998) Moving validated instructional practices into the classroom: learning from examples about the rough road to success. *Learning Disabilities Research and Practice* **13:** 121–125.

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APPENDIX 4.1 Summary of studies in the in-depth review

Authors	Country	School/Grades N of teachers (students) and schools	Curriculum	Research foci and (general approach)	Evidence collected and presented	Outcomes measured	Outcomes/Relationships
Jordan and Stanovich (2001) Patterns of teacher-student interaction in inclusive elementary classrooms and correlates with self-concept	Canada	Primary 3rd/4th 9 (48) 6	Language Arts Maths Science	Relationships across the teachers' beliefs about their roles with learners with SEN, their teaching practices, and the self-concept of their students (quantitative)	Observations of interactional patterns and conversational sequences; Inventories to teachers about beliefs and to pupils re self-concept	Pupil self-concept Teacher beliefs Classroom interaction	Teacher beliefs related to differences in their interaction patterns for all pupils. INT teachers had more prolonged interactions at higher cognitive level with SEN. Different interactional patterns and beliefs are related to student self-concept. Students (+SEN) of INT teachers scored higher on self-concept. WoE D: Medium
Palinscar et al. (2001) Making science accessible to all: results of a design experiment in inclusive classrooms	US	Primary 4th/5th Phase 1: 4 (168) Phase 2: 4 (111)	Science	Engagement and learning of SEN within guided enquiry science instruction (quantity and quality)	Observations of interactions in whole class and small group; 3 written assessments, pre/post; interviews with target pupils Pupil work samples Teacher journal entries	Reading skill Science concepts Attitudes re Science	Significant learning gains made by all students. Participation of SEN influenced by the nature and amount of assistance received. SEN found it difficult to learn from large-group discussions without support. One-to-one discussion with the teacher helped to maximise engagement. WoE D: Medium

Authors	Country	School/Grades N of teachers (students) and schools	Curriculum	Research foci and (general approach)	Evidence collected and presented	Outcomes measured	Outcomes/Relationships
Rieth et al. (2003) An analysis of the impact of AI on teaching and learning activities in two ninth grade language arts classes	US	Secondary 9th 1 (62) (1)	Literature	Effect of anchored instruction (AI) on quantity and quality of interaction	Observation of length and levels of student and teacher questions and statements/ responses Teacher and pupil interviews	Length and quality of teacher and pupil interaction	Increased student participation, attention to task, and understanding of content. Quantity and quality of high level interaction rose. More thought-provoking questions from the teacher led to more thoughtful responses from students. WoE D: Medium
Tindal and Nolet (1996) Serving students in middle school content classes: a heuristic study of critical variables linking instruction and assessment JnSpEd	US	Middle/ Secondary 7th 2 (74) 1	Science	Relationships across curriculum, verbal interactions, and performance outcomes	Audio recordings of interactions attending to facts, concepts and principles; analysis of textbooks for same; 3 assessments (test, task, and perception probe) interviews with teachers	Student perceptions of lesson concepts Student knowledge and understudying of the specific science taught; content/ focus of classroom interaction	Verbal instruction and textbook concepts aligned. Information in content classes was not of equal value and this was not always obvious to pupils with SEN. WoE D: Medium

Authors	Country	School/Grades N of teachers (students) and schools	Curriculum	Research foci and (general approach)	Evidence collected and presented	Outcomes measured	Outcomes/Relationships
Wallace et al. (2002) An ecobehavioral examination of high school classrooms that include students with disabilities	US	Secondary 118 classrooms 96 teachers 4 schools	Range of subjects	Teacher behaviours, student responses, and classroom ecology in settings that had success in including students with SEN (qty)	Observations of teacher behaviours, student responses and aspects of classroom ecology (physical arrangement, instructional grouping and instructional task)	Academic, task management, and competing responses of students Academic, discipline management (teachers)	High level academic engagement & low level inapprop. behavior for all; no sig. diffs in the behaviour of students with and without disabilities; more than 75% of time spent instructing, managing and interacting with their students; students with disabilities were more often the focus of their teachers' attention than students without disabilities WoE D: Medium
Ward and Center (1999) Success and failure in inclusion: some representative case histories	Australia	Primary and Secondary Stage 1 43 students with disabilities	Range of subjects	Quality of the educational and social experience of children with disabilities (mixed methods leading to case accounts)	Child measures: tests, engaged time Classroom measures: observation School measures: resources and ethos Questionnaires and interviews	Academic success Engagement Curriculum modification	Academic and social outcomes of mainstreaming may be highly 'idiosyncratic' Factors contributing to successful mainstreaming: modifications to the curriculum; use of structured teaching strategies; the availability of trained support staff; a supportive school policy; positive teacher attitudes; and a principal and staff committed to mainstreaming. WoE D: Low

Authors	Country	School/Grades N of teachers (students) and schools	Curriculum	Research foci and (general approach)	Evidence collected and presented	Outcomes measured	Outcomes/Relationships
Zembylas and Isenbarger (2002) Teaching science to students with learning disabilities: subverting the myths of labelling through teachers' caring and enthusiasm	US	Primary 4th/5th 1 boy	Science	Role of teacher's caring and enthusiasm in science classroom (action research/ descriptive)	Teacher description of pupil responses and behaviours	Academic success Engagement	The importance of caring relationships and the inappropriateness of labels for describing students with disabilities WoE D: Low

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/reel/**

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