

Teaching Strategies and Approaches for Pupils with Special Educational Needs: A Scoping Study

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EXECUTIVE SUMMARY

Teaching strategies and approaches for pupils with special educational needs: a scoping study

Background

Since the 1997 Green Paper, *Excellence for All Children*, the government has made a firm commitment to a high quality of education for pupils with special educational needs (SEN). It has recognised that building the capacity of teachers and schools to teach pupils with a diverse range of SEN is key to raising the achievement of these pupils. This report provides an overview of teaching strategies and approaches for pupils with special educational needs, the theoretical underpinnings of these strategies and approaches, and the role of specialist knowledge in teaching these pupils. The report also considers how the findings of the scoping study might become embedded in every day teaching practice.

Approach

The scoping study drew upon national and international publications, including reviews of research findings, individual research reports and professional guidance for teachers. The ‘areas of need’ as defined in the 2001 SEN Code of Practice were used as a framework for organising the literature under a manageable number of headings, which we called strands. The areas of need are:

- Communication and Interaction
- Cognition and Learning
- Behaviour, Emotional and Social Development
- Sensory and/or Physical

Key Findings

Across all types of special educational need there was variety in the research methods used. Differences between the profile of the type of evidence associated with each strand area has much to do with the cultural and historical development of research in that area, as well as to the nature of the ‘special educational need’ under investigation. Key teaching strategies and approaches associated with each area of need defined in the SEN Code of Practice were identified as follows:

Communication and Interaction

- Children with speech and language communication needs benefit from mainstream education with additional support mechanisms, especially in the early years, but also extending into secondary education.
- Research suggests the use of intensive interaction and/or a ‘sensory’ based approach are effective for children with communication and interaction difficulties associated with profound and multiple learning difficulties .

- The evidence on effective strategies for children with autistic spectrum disorder (ASD) is less conclusive and there is competing evidence and debate about effective approaches and strategies.

Cognition and Learning

- The teaching of transferable thinking and learning skills is commonly emphasised in professional guidance. Effective teaching strategies may include the use of ‘procedural facilitators’ like planning sheets, writing frames, story mapping and teacher modelling of cognitive strategies, although for quality and independence in learning it is crucial to extend these technical aids with elaborated ‘higher order’ questioning and dialogue between teachers and pupils.
- Research evidence and professional guidance emphasises the importance of the classroom as a whole learning environment, including the distinctive new developments in ICT.
- There is evidence about the need for explicit, comprehensive and integrated teaching of different aspects of reading linked to spelling and writing.
- There is little evidence of the need for distinctive teaching approaches for children with specific learning difficulties although responding to individual differences is crucial. The key to appropriate teaching lies in careful and ongoing assessment linked with teaching.

Behavioural, Emotional and Social Development

- The use of peers is a valuable resource either as part of a behaviour management programme (e.g. peer-monitoring) or peer-oriented intervention (e.g. buddy system).
- Approaches that encourage children to regulate their behaviour by teaching them self-monitoring, self-instruction and self-reinforcement skills are effective in producing adaptive behaviour change (i.e. increased on-task behaviour, reductions in anti-social behaviour).
- Approaches using positive reinforcement (where appropriate behaviour is immediately rewarded), behaviour reduction strategies (such as reprimands and redirection), and response cost (a form of punishment in which something important is taken away) appear to be effective in increasing on-task behaviour.
- Combinations of approaches (e.g. cognitive-behavioural *with* family therapy) are more effective in facilitating positive social, emotional and behavioural outcomes than single approaches alone.
- The research suggests that effectiveness is enhanced when parents are actively involved as partners in their child’s education.

Sensory and/or Physical

- Strategies emphasising the importance of providing opportunity for developing skills of social interaction and access to the child’s local environment such as participatory/active learning methods, physical education as a means of bridging the therapeutic/educational divide for pupils with physical disabilities and combining emotional and social development with academic and cognitive growth were recommended as effective .
- The literature emphasised strategies and approaches which providing opportunities for developing the child’s independence.

- Systemic strategies and environmental adaptations were found to increase access to participation and learning.
- The use of technology was considered particularly promising.

The review found that teaching strategies and approaches are associated with but not necessarily related directly to specific categories of special educational need (e.g. autism, learning difficulty, etc). A range of theoretical perspectives underpins research in each of the strand areas however there is considerable overlap with behavioural, social constructivist and ecological approaches dominating the intervention literature. At the same time there is an increasing understanding of psychological and educational connections between different theoretical approaches to teaching and learning, and between social, emotional and cognitive aspects of educational experience.

The review found that there is evidence that a multi-method approach is promising. Research on the efficacy of multiple approach strategies reports that a combination of strategies produces more powerful effects than a single strategy solution.

The teaching approaches and strategies identified during this review were not sufficiently differentiated from those which are used to teach all children to justify a distinctive SEN pedagogy. This does not diminish the importance of special education knowledge but highlights it as an essential component of pedagogy.

There is an increasing acceptance within the literature of the need to locate the education of children with SEN within inclusive policy and practice, with emphasis on improving the whole learning environment and the combination of teaching and learning processes applicable to all children; an approach that should serve to prevent some children from needing to be identified as having special educational needs.

Conclusion

The report concluded that questions about whether there is a separate special education pedagogy are unhelpful given the current policy context, and that the more important agenda is about how to develop a pedagogy that is inclusive of all learners. The report considers how the strategies identified from the review as having the potential to raise achievement might be usefully organised in a typology that could be used to create a multi-method response to teaching pupils with special educational needs.

The report contains recommendations for further research. A second phase of this research programme should involve systematic, long-term development work across a range of sites and settings, which also allows for the examination of the impact of the innovations upon achievement. Such research is necessary to advance knowledge about teaching and learning, and to understand how *combinations of teaching approaches* might be used in different contexts and for different purposes. Such a research programme should examine teaching and learning in real settings as it will need to take account of the ways in which teachers do their work in relation to the wide variety of situations they face.

CHAPTER ONE: INTRODUCTION

This is the final report of a four month scoping study, *Teaching Strategies and Approaches for Pupils with Special Educational Needs*, commissioned by the DfES in June 2003. The work was undertaken by research teams based at the universities of Manchester and Cambridge. This report presents a considered analysis of the literature on teaching strategies and approaches for pupils with special educational needs together with recommendations for further research on this topic.

1.1 Aims & Objectives

Since the 1997 Green Paper, *Excellence for All Children*, the government has made a firm commitment to a high quality of education for pupils with special educational needs (SEN). It has recognised that building the capacity of teachers and schools to teach pupils with a diverse range of SEN is key to raising the achievement of these pupils. To this end, it commissioned this scoping study in order to **map out and assess the effectiveness of the different approaches and strategies used to teach pupils with the full range of SEN**. More specifically the research aimed to:

- Undertake a literature review which will broaden understanding of the different learning profiles of pupils with a range of SEN and identify the best ways of teaching them as recommended by the various theoretical perspectives of teaching and learning.
- Demonstrate the effectiveness of these different approaches/strategies in raising the achievement of pupils with SEN.
- Identify the most effective teaching approaches and strategies for pupils with the full range of SEN at different phases of their learning.
- Make recommendations for the focus and development of future research in this area.

With these aims in mind, we formulated a series of questions to guide the study as follows:

- (i) What are the principal theoretical perspectives that indicate or reflect effective teaching approaches/strategies for pupils with SEN?
- (ii) What is the evidence that these strategies and approaches are successful in raising the achievement (academic, emotional, social, behavioural) of pupils with SEN?
- (iii) What is the evidence that these strategies and approaches are successful for pupils with SEN at different stages of their learning?
- (iv) What are the distinctive approaches, identified from the answers to i), ii) and iii) above, that can form the basis for the development of new initiatives/materials that can be evaluated during the second phase of the research?
- (v) How can schools and LEAs make most effective use of best practice knowledge in relation to teaching approaches and strategies in planning for pupils with SEN?
- (vi) To what extent are these approaches and strategies consistent with current knowledge regarding the development of inclusive schools?

1.2 Methods

A two-phased strategy for meeting the project aims and answering the research questions was adopted. The first three questions guided the literature review which was undertaken during July and August 2003. The findings of the review were then analysed in relation to the second three questions which relate to the future development of teaching strategies and approaches for pupils with special educational needs.

Mapping the effectiveness of different approaches and strategies employed to respond to the full range of children's special educational needs is a complex task because the field is broad, covering a range of educational needs across all phases of education. This scoping study drew upon national and international publications, including reviews of research findings, individual research reports and professional guidance for teachers. One of the key factors we considered was the extent to which the review should be led by literature that refers to categories of impairment in the field of SEN. It was decided to adopt the 'areas of need' as defined in the SEN Code of Practice as a feasible means of grouping the literature under a manageable number of headings. This strategy would include all pupils having some form of SEN as well as being generally understood by parents, practitioners and policy-makers. The areas of need are:

- Communication and Interaction
- Cognition and Learning
- Behaviour, Emotional and Social Development
- Sensory and/or Physical

Cross-university teams were organised around these four areas which we called strands. Each strand was led by a faculty member from either Cambridge or Manchester who liaised with a counterpart in the other institution. In this way team leaders were supported by a link colleague who organised and co-ordinated the contribution of colleagues and research assistants within their institution. The strand teams were steered by the project managers.

The search strategy relied on three main sources of information:

- Professional knowledge and bibliographic input from team members
- Online searches of relevant databases
- Library catalogue searches

These approaches were chosen for their efficiency, to enable the work to be completed in the specified time, and comprehensiveness, to enable the international literature to be searched. The sources and the search strategy are described in detail in Appendix A. It should be noted that the brief for this project was to undertake a *scoping study* rather than a full-scale systematic literature review.

As this scoping study was not commissioned as a systematic review, we did not restrict our search to research which involved controlled clinical approaches to the study of teaching approaches and interventions. This was important as many systematic reviews exclude numerous interventions, not because they are ineffective, but because their effects have not been documented by the specific research designs specified in the selection criteria. A bibliography listing all of the sources identified during the course of the project is included in Appendix B.

The work presented here is based on professional knowledge and bibliographic input from the research team as well as online searches of relevant databases. We searched widely for literature

reviews and studies which reported on teaching strategies for pupils with special educational needs in order to survey the current scene in terms of topics, approaches, key theoretical concepts and to identify seminal works. Specific review criteria were not applied, nor were sources subjected to the rigorous scrutiny of a systematic review.

1.3 Findings of the Review

Recently there has been a return to the debate about the advantages and disadvantages of the re-introduction of the use of categories of impairment in the field of SEN. We are aware of arguments in favour, including, that the re-introduction would facilitate research on outcomes for pupils with special educational needs. There are also arguments against. Nevertheless, an important element of the scoping study was to consider whether certain teaching approaches are more (or less) appropriate for pupils with particular impairments.

To this end we produced strand reports which summarised the literature on teaching strategies and approaches for pupils who experience difficulties in one or more of four areas (cognition and learning needs, behaviour, emotional and social development needs, communication and interaction needs and sensory and/or physical disability needs). Though we found a range of theoretical perspectives underpinning the strategies and approaches these tended to cluster around three principal theoretical perspectives. These are: (1) behavioural (2) social constructivist and (3) ecological perspectives. Each is discussed below.

1.3.1 Principal theoretical perspectives

Behavioural models of learning focus on observable outcomes of learning as influenced predominately by the key principles of reinforcement theory in different learning contexts. This theory considers all behaviour is learned according to rules which shape, change or sustain it. Cognitive-behavioural approaches take account of the capacity of individuals to understand and reflect on their behaviour. The advantages of this model lie primarily in the positive, practical outlook, the clear signs of success, and the ways in which the setting of specific targets allows all those involved in teaching and learning to understand the goals and expectations for individuals and groups of pupils. However these approaches have been criticised for an overly narrow focus on measurable learning outcomes, when it is known that many aspects of knowledge and understanding are not directly observable and measurable in the required form. There is also an acknowledged danger of pupils' coming to rely on extrinsic rewards for achieving success.

Constructivist models of learning are those in which children are seen as active participants in the processes of seeking out knowledge, making sense of their experiences and gaining intrinsic satisfaction from learning and solving problems. Constructivist learning is seen to be a transformative experience which opens up opportunities for further learning as children gain greater depth of understanding and increasingly flexible ways of representing their knowledge and dealing with new information. Related to this approach is social constructivism or sociocultural theory. Here children's active role in learning is set in the context of their membership of social groups and communities (such as classrooms and schools) which jointly create knowledge through their engagement in purposeful and valued activities.

Ecological models of learning focus less on the individual learner and more on the interaction or ‘goodness-of-fit’ between the learner and his or her environment. Ecological models operate within a concept of ‘nested systems’ or ‘levels’ often referred to as bio, micro, meso, macro exo, chronosystems (Bronfenbrenner & Morris, 1998). In such a model the learner is situated in the centre of the system interacting at various levels each of which are part of a larger system, for example, the level of the classroom (micro level), the level of the school not involving the child directly (macro level) and society (macro level). Teaching strategies and approaches often focus at a micro level but acknowledge or incorporate activity at broader levels. The mesosystem refers to the relationships between two or more settings in which the child participates. Such an approach allows consideration of the role of such things as school or community culture in learning.

1.3.2 Strand Reports

The strand reports were constructed in the form of a six part structure, beginning with a consideration of the groups of children who experience difficulties in the area of need, followed by an overview of the forms of evidence predominating in the research literature, an overview of the principal theoretical perspectives underpinning the review of literature, some promising effective teaching strategies and approaches, details of what counted for evidence that these strategies and approaches were successful for pupils with SEN at different stages of their learning and emerging gaps in the literature.

CHAPTER TWO: COMMUNICATION AND INTERACTION

2.1 Who are the children?

There is a diversity of communication and interaction needs and, indeed, a wide variation in the terminology used to refer to this group of children. It is also important to note that the nature of these needs may change over time, as may the ways in which these impact upon children's learning. It is also difficult to equate the terminology used in much of the research literature with the classifications used in the Pupil Level Annual Schools Census (PLASC), since some of the literature regarding severe learning difficulties (SLD), or profound and multiple learning difficulties (PMLD), tends to be inextricably linked with a consideration of communication and interaction.

Consequently, for the purposes of this review it was decided to think about the children associated with this strand in terms of in three broad groupings. These are as follows:

- **Children with speech, language and communication needs (SLCN).** In much of the research literature, children with SLCN are referred to as having specific speech and or language impairments (SSLI), or as children with specific speech and or language difficulties (SSLD). Here the work of Dockrell and Lindsay, (2000) has been influential in that they went some way towards establishing a common terminology for those children who are unable to express themselves in the normal effortless way as their peers, and where the difficulty cannot be attributed to physical or sensory impairments, (Bishop, 1997; Adams Byers Brown and Edwards, 1997). Such communication difficulties are said to affect about 7.4% of the child population (Tomblin, Records, Buckwater *et al.*, 1997).
- **Children with communication and interaction difficulties associated with severe and profound learning difficulties.** This group of children tend to communicate at an early intentional or pre-intentional level. They may adopt atypical, idiosyncratic, non-verbal or augmentative (assisted) methods of interacting with the world around them (Coupe-O'Kane and Goldbart, 1998). Intervention aims may vary from bringing the child's language skills up to an age equivalent level, engendering social interaction with peers, using basic cognitive processes to develop information handling and management within the curriculum, removing obstacles to enable the child to participate in learning and the life of the school (See Dee, Byers, Hayhoe and Maudslay, 2002 and Byers, 1998, in relation to children and young people with more complex communication difficulties).
- **Children with Autistic Spectrum Disorders (ASD).** This term covers a range of pervasive developmental disorders which include 'classic' autism (often in association with additional learning difficulties), for instance:
 - Asperger syndrome which is sometimes referred to as 'high functioning autism';
 - Heller's and Rett's syndromes (these two being degenerative conditions that may exhibit autistic features (e.g. see Dempsey and Foreman, 2001); and pervasive developmental disorder (PDD-NOS). Children in this group are seen as displaying deficits in three key areas, atypical communication and social development, adherence to ritualistic behaviour, plus a resistance to change (Howlin, 1998), with variable age of onset. Figures for incidence and prevalence vary widely because of the variety of labels used in different studies.

2.2 The nature of the evidence

The literature that was reviewed points to the following:

- There is a high proportion of professionally-oriented practitioner accounts in relation to this strand (e.g. Spooner 2002 and Lees and Urwin, 1998 for SLCN), which typically are either functional in approach or involve highly specialised test-retest models.
- Carefully controlled comparative studies are rare (See Panerai, Ferrante and Zingale, 2002 in relation to ASD for an example), as are studies evaluating specific teaching approaches (See Jordan, Jones and Murray 1998 for ASD; Law 2000 for SLCN).
- Studies tend to involve small numbers of subjects, are frequently ill-defined, use non-standardised or non-replicable methods of assessment and are described in insufficient details to enable their replication.
- Measurement of outcomes using established tests has only recently started to appear in the literature. There are a few high quality longitudinal studies that are following pupil progression through school (for example, see the work of Botting, Conti-Ramsden and Crutchley, 1998, and Knox 2002).

2.3 Principal theoretical perspectives under-pinning the research literature

Several theoretical perspectives appear to underpin this literature. The field is complicated by the differing perspectives from which the research originates, e.g. psycholinguistic, (work on SSLI by Bishop 1997), behaviourist perspectives (e.g. influencing some ASD pedagogies), and developmental-interactionist or social constructivist perspectives, which are sometimes found in methods used with children with more complex communication and interaction difficulties.

Preferred theoretical perspectives are also influenced by whether the researcher comes from a teaching, clinical therapeutic and or neuropsychological background. This, in part, explains the complexity of complementary terminologies used in the context of this strand. The main overall models are as follows:

Behavioural: methods associated with this perspective usually involve imitation, shaping, rehearsal reinforcement, usually task or skill specific. Targets are designed to be defined and measurable.

Cognitive: here the focus is usually on using and developing basic cognitive processes to improve skills in information storage, processing, organizing and retrieval. This may be at a phonological processing level, word level (semantics and grammar or syntactic level), or sentence level. Other related perspectives include different models of auditory memory, and approaches that examine how different aspects of language are stored and called up when needed.

Developmental: this perspective involves an analysis of the developmental stages through which a child is believed to pass. Although still prevalent in some literature, this model is no longer exclusive. Naturalistic approaches, as opposed to ‘direct’ teaching methods, may sometimes be included within this framework.

Interactionist: this perspective is known by a number of names, including experiential learning. It emphasises the development of meaningful relationships with the child’s environment, instead of teaching of skills in isolation. The child is encouraged to gain from positive experiences of

communication and interaction, to solve problems, and to devise and use a variety of increasingly complex communicative intentions and strategies.

2.4 Some promising teaching strategies and approaches

The literature highlights what seem to be some promising approaches to teaching, as well as examples of good practice. These include:

- *Early identification and intervention* Early intervention is key to implementing successful teaching strategies for pupils with ASD as well as children with language impediments (Fraser, 1998).
- *Involvement of parents and families in a collaborative partnership.* See, for example, the work of Shields (2001) in relation to children with ASD, and the account of the Hanen Programme (e.g. Manolsen 1992) for those with SLCN.
- *Collaborative working with other agencies in a child centred approach.* This is particularly important since support services may have differing foci on the form and purpose of the intervention they envisage (see Wright and Kersner 1998; Law, Lindsay, Peacey *et al.*, 2000; Law, Lindsay *et al.*, 2001 for children with SLCN).
- *Teaching approaches that adopt additional (visual) reinforcement strategies to supplement verbal instruction* (see Chiat, Law and Marshall, 1997 for children with SLCN; Siegel 2000 for children with ASD) *and be conducted alongside typically developing peers* (e.g. McConnell 2002 for children with ASD).
- *An emphasis on teaching language and cognitive process, and the strategies needed for effective generalisation through varying degrees of structure designed to match the child's needs* (see, for example, Adams and Conti-Ramsden 1995 for children with 'SLCN').

Beyond these general conclusions, there is some benefit in considering the approaches to teaching the three sub-groups identified within this strand separately, since there is some evidence suggesting that the needs of the children in each of these groups will likely be best addressed by different means. Some promising teaching approaches and strategies for each of the three groups are provided below:

2.4.1 Children with Speech, Language and Communication Needs

- This group of children is often described in terms of a developmental delay or disorder. Many children experience delays during childhood affecting their speech or language development. For the majority of children these difficulties resolve themselves with maturation and/or as a result of therapy. A language disorder is suspected when there is a discrepancy between verbal and non-verbal cognitive ability.
- Reports of approaches and teaching strategies have generally focused on placement, intervention and curriculum differentiated provision using highly individualised, child specific programmes.
- The type of intervention available varies according to geographical area, whether the speech, language and communication needs are primary or secondary to other difficulties, e.g.

behaviour problems or attention difficulties, and systemic arrangements (Law, Lindsay, Peacey *et al.*, 2000).

- Children with SLCN were noted to benefit particularly from mainstream education with additional support mechanisms, especially in the early years, but also extending into secondary education. (Conti-Ramsden, Knox *et al.*, 2002).

2.4.2 Children with communication and interaction difficulties associated with profound and multiple learning difficulties.

- It has been argued that enhancing the communication of this complex group of individuals is fundamental to their participation and achievement, in all areas of the curriculum (QCA/DfEE, 2001). This philosophy has influenced a greater emphasis in the research literature for this area in recent years,
- Approaches have moved away from task-centred, essentially behaviourist, incrementally designed approaches, towards a more social constructivist stance (see section on social constructivist teaching in chapter 3: Cognition and Learning).
- The teaching of skills out of context and adherence to developmental checklists based on normally developing infants has been questioned by some researchers, (e.g. Sebba, Byers and Rose, 1995), since such methods discourage peer interaction and forms of experiential learning that would be both meaningful and relevant to the individual child concerned.
- Research has led to a more ‘sensory’ based approach being used in order to develop opportunities for exploration of and interaction with multi-sensory environments (Aitken and Buultjens, 1992; Ware, 1996; 2003), or for intensive interaction (see Nind, 1996; Hewett and Nind, 1998).
- The use of ‘objects of reference’, and other formal and informal communication enabling systems are encouraging a more open, inclusive (child- and whole-school) centred approach to this group of individuals with more complex needs (Aitken, Buultjens, Clark, Eyre and Pease, 2000).

2.4.3 Autistic Spectrum Disorder (ASD)

- There are a wide variety of comprehensive and specific teaching approaches used with children with ASD, and very few are used in isolation. According to Drudy (2001), Jordan *et al.* (1998) and Siegel (2000), current methods include: applied behaviour analysis (Lovaas therapy), aromatherapy, art therapy, behaviour modification (for teaching skills or managing behaviour), computer assisted learning, daily life therapy, diet, drama therapy, EarlyBird, facilitated communication, floor time (the Greenspan approach), Geoffrey Walden approach, Hanen programme, holding therapy, Makaton signing and symbols, massage, the Miller method, music therapy, musical interaction therapy, option method, picture exchange communication system (PECS), sensory integration, Sherborne movement, social stories, speech and language therapy, treatment and education of autistic and communication handicapped children (TEACCH).
- Jordan *et al.* (1998) report that an eclectic approach is usually adopted and practice is influenced by the experience and expertise of staff and of visiting professionals (i.e. speech and language therapists, educational psychologists).
- For many of the approaches above there is limited or no research evidence relating to their effectiveness. Examples include aromatherapy, art therapy, option method, and holding

therapy. Some teaching approaches have been researched and reported as having no beneficial effects. These include facilitated communication and auditory integration training (Drudy, 2001). Other approaches have a research base with mixed results. These include sensory integration and daily life therapy (Drudy, 2001; Jordan *et al.*, 1998). Finally, there are two main approaches that have (a) been subjected to research, and (b) provided promising outcomes. These are applied behaviour analysis (ABA) and treatment and education of autistic and communication handicapped children (TEACCH).

2.5 Phases of education

The research evidence is difficult to classify in terms of the phases of education. Typically, ages are cited in the literature but reference to educational ‘stages’ is less common. Accounts of research are rarely related to subject or Key Stages, with one or two notable exceptions such as:

2.5.1 Pre-school

- Descriptions of intervention studies were conducted on small numbers of subjects and tended to examine improvements in skill deficits, such as poor receptive vocabulary, improvement of lexical learning, developing pragmatic (social communication) skills, or encouraging interactive relationships with the world around the child. The effectiveness of the interventions in terms of language gain, cumulative and learning effect is not generally stated in reviews of methods. Effective approaches optimised opportunities for learning how to communicate (See, for example, Windfuhr, Faragher and Conti-Ramsden, 2002 and Giolametto *et al.* 1996 for SLCN; Dawson and Osterling 1997 for ASD).
- A significant body of literature reviewed by Fraser (1998) indicates that success in this phase is related to early support to foster high quality forms of interaction between parent and child, e.g. Portage (Bluma *et al.*, 1976), Sure Start and Hanen Programmes (Manolsen, 1992), with the NAS Earlybird Programme (Hardy, 1999 and Shields, 2001), and intensive interaction (Nind and Hewett, 2001) not coming in until the child started at school.

2.5.2 Key Stages 1-2

- As noted above, there is a substantial body of research on teaching strategies and approaches for children with autism. For instance, Panerai, Ferrante and Zingale (2002) compared TEACCH to an integration approach with two groups of matched children over 12 months. They found TEACCH to be the significantly more effective approach in improving a range of physical, intellectual and communication skills in school age children with ASD. Meanwhile, other studies also show other approaches/strategies for teaching children with ASD that appear to be effective.
- A focus on language processing, information management and the development of generation of language and communication was reported to be of long lasting benefit for children with SLCN (see Spooner, 2002 and Crosbie, Dodd and Howard 2002).
- Teaching word roles in semantic and syntactic (grammatical) contexts are used in some approaches to teaching children with SLCN (see Windfuhr *et al.* 2002).
- Progress at KS1 and KS2 was reported in longitudinal studies (see earlier), but little was covered beyond this point. Some approaches were seen as being dependent on type of provision (see Dockrell and Lindsay, 1998; Knox, 2002).

- There are inherent problems in the current assessment of children's progress throughout their education, because measurement is primarily language based. Current guidelines for testing arrangements for children with SEN do not have formal provision for children who are perceived to be disadvantaged by language and communication impairments both in the classroom or through more formal examination arrangements, although many have *informal arrangements* in place.

2.5.3 Key Stages 3-4

- Lees and Urwin (1998) provide guidance and a review of approaches considered to be useful with teenagers who have 'language disorders'.
- Snowling *et al.* (2001) and Adams *et al.* (2001) investigated school leavers with SLCN at the end of KS4. The studies highlight the importance of on-going literacy support for young people with literacy difficulties.

2.6 Gaps in the literature

The review points to the following 'gaps' that would warrant greater attention:

- Measurement of timing and intensity of existing approaches in schools.
- More extensive, comparative studies leading on from the work by Conti-Ramsden and colleagues on children with SLCN
- Knowledge of specific practices used to enable access to specific curriculum subjects.
- High-class evidence-based research investigating the specific needs of children with Asperger's syndrome. Their language difficulties are often subtle, hard to distinguish and can be misinterpreted as behaviour problems.
- Systematic evaluation of the benefits of the 'new' communication technologies with pupils with more complex and severe communication and language needs at different stages of their education.

CHAPTER THREE: COGNITION AND LEARNING

3.1 Who are the children?

The SEN Code of Practice identifies ‘cognition and learning’ as one of the four areas of need. This may apply not only to children who are seen to have general or specific learning difficulties, but also to children with physical and sensory impairments, and those on the autistic spectrum. It is also acknowledged that some children may have associated sensory, physical and behavioural difficulties which compound their needs (DfES, 2001:86, para 7:58).

Researchers generally agree that it is not a straightforward matter of discovering children with intrinsic, diagnosable cognitive impairments, which can be simply remediated. It is recognised in current writing about special educational needs that it is necessary to take account of a range of interacting factors and related values: biological, psychological, social and cultural – in order to understand and respond appropriately to children identified as having learning difficulties in school. The generalisation of research findings to other children in different educational contexts is therefore problematic.

This review focuses broadly on children who are seen to have a primary difficulty in academic learning – typically in aspects of attention, memory, problem-solving, reasoning, transfer of learning, language and literacy. Associated difficulties may emerge in motivation, self-confidence and social relationships. Much research in this field focuses on teaching children who are either identified as having specific learning difficulties, or who have a syndrome commonly associated with learning difficulties (e.g. Down syndrome) – perhaps because these are more easily definable groups in spite of the acknowledged individual differences. However it has been noted that studies vary widely on the selection criteria, even for specific categories (Swanson, 2000: 13).

Research with children who are identified as having low attainment and or mild or moderate learning difficulties in the UK commonly focuses on pupils placed in particular school settings (special and mainstream), so the categorisation implicitly depends on policy and provision in local LEAs and schools. In contrast research on ‘mental retardation’ or ‘cognitive disability’ in the USA tends to make more use of an IQ score in describing the children involved – an approach with its own limitations.

Research on children with more severe and profound and multiple learning difficulties is not separately or thoroughly covered in this section, but relevant findings can be found elsewhere in this report - notably in the area of communication and interaction.

3.2 The nature of the evidence

Controlled experimental research with one-to-one instruction in isolated settings is relatively rare in this field, except for certain specific approaches such as training in ‘mnemonics’ or memory-enhancing strategies for children with a range of general and specific learning and behavioural difficulties (Scruggs and Mastropieri, 2000). Studies typically focus on a previously identified group of children placed in particular school settings, sometimes with allocation to separate treatment and control groups (the latter is commonly equivalent to ‘ordinary classroom teaching’). Numbers tend to be small, often not more than 20-30 children and frequently fewer, although there are some very large scale studies of reading interventions involving up to 3000 participants (Brooks, 2002). School-based interventions vary in the length and intensity of teaching. For example, the 25 studies of reading intervention reviewed by Brooks (2002) varied

from 4 weeks to 52 weeks, and from 30 minutes daily to less than 30 minutes a week of teaching. Swanson *et al.*'s 1997 US meta-analysis of 180 intervention studies for children with learning disabilities found that a prototypical intervention included about 23 minutes of daily instruction, 3-4 times a week, for 36 weeks, with a mean sample size of 27 children and a mean age of 11 years (2000:12). Quantitative data commonly includes standardised tests of reading, spelling and numeracy, assessments of academic attainment (e.g. tests of content knowledge), and rates of progress towards preset targets. Qualitative data includes transcripts of teacher-pupil dialogue (e.g. Watson, 1996), and classroom observations - often with rich descriptive detail of children's progress over time. Case studies and action research projects are likely to fall into this latter category, although such findings are still rarely disseminated widely or included in research reviews. It should be noted that many reviewers express serious doubts about the partial quality of the research literature, the lack of rigour and the difficulty in establishing consistency in definitions of special educational needs (e.g. Dockrell *et al.*, 2002; Fletcher-Campbell, 2000; Norwich and Lewis, 2001).

3.3 Principal theoretical perspectives

3.3.1 Cognition and metacognition

Research focuses variously on the development of basic cognitive processes for handling information (e.g. memory; phonological processing), the 'metacognitive' executive awareness and control of thinking and learning (e.g. 'thinking skills', learning strategies and 'learning how to learn'), and sometimes on the inter-relationship of these aspects of cognition (e.g. the links between word reading and reading comprehension). There is some acknowledgement that cognition is 'situated', meaning that children's attainment is affected by the familiarity, level of abstraction and the perceived purpose of investigation and problem solving (e.g. Gersten *et al.*, 2001, on maths and science). New developments in neuroscience are shedding some light on variations in brain functions for some children with learning difficulties, but they have yet to provide comprehensive and differentiated implications for teaching (although some interventions such as developmental physical exercises for children identified as having specific learning difficulties are beginning to be reviewed and disseminated to practitioners, Pope and Whitley, 2003; Goddard Blythe, 2003).

3.3.2 Social constructivist teaching

Much current research in this area takes a social constructivist perspective on learning, viewing children as active, curious learners who are motivated to join with other people to solve problems, develop knowledge and contribute to development of the learning community to which they belong. Learners benefit from the thoughtful attention and support of other people who provide expert knowledge and guidance which is gradually internalised to allow self-regulation ('scaffolding' and guided participation). For children with learning difficulties problems may have arisen at any stage in this process – the motivation, the communication and interaction with other people, the skill of the teacher, for example. Responsive teaching strategies based on this approach typically focus on different aspects of teacher-pupil interaction, classroom dialogue, 'real' problem solving and practical classroom activities, pupil choice, and reflection on learning (Watson, 2001). Some social constructivist approaches explicitly hand over some of the teaching responsibilities to pupils via a process of modelling and guided practice (e.g. reciprocal teaching for developing reading comprehension in children at all levels of reading development (Rosenshine and Meister, 1994).

3.3.3 Learning modes, styles and preferences

Models of individual differences in learning (e.g. visual, auditory and kinaesthetic modes; multiple intelligences; etc.) have a strong professional interest and resonance. Many case examples are emerging (e.g. Caviglioli, 1999) reporting on the use of 'mind-mapping' to help a child with Down syndrome represent his understanding of stories; such approaches to curriculum development are becoming part of many schools' inclusion strategies. There is an ongoing need for research on the effectiveness of these approaches for children identified as having learning difficulties.

3.3.4 Complementing and combining

There is a growing understanding of the need to move away from the belief that one model of learning informs and justifies one model of teaching. So structured behavioural techniques, for example, will be just one set of skills available for selection by teachers according to an assessment of children's overall needs (Farrell, 1997:59). Reason (2003:2) remarks on the finding that the more effective interventions for teaching reading are those which have a more comprehensive model of reading and therefore a more complete instructional approach. Similarly, Swanson (2000: 23) notes from his 1997 US meta-analysis that a combination of teaching strategies (involving elements of 'direct instruction' and 'strategy instruction') is more effective for children with learning disabilities than other narrower models of teaching, because lower order and higher order reading skills interact to influence reading outcomes. Gersten *et al.* (2001) provide evidence about the importance of combining explicit instruction with guided problem solving and discussion in order to ensure transfer and generalisation of learning in subjects like mathematics and science for children identified as having learning disabilities.

3.4 Some promising teaching strategies

3.4.1 Reading

There is evidence about the need for explicit, comprehensive and integrated teaching of different aspects of reading – phonological, syntactic and semantic – and that reading should be linked to spelling and writing. 'Ordinary teaching' is unlikely to be adequate for allowing struggling readers to catch up with their peers and many children will need repetitive and cumulative learning opportunities, together with metacognitive development, well-informed teachers and professional collaboration and support (Brooks, 2002; Fletcher-Campbell, 2000; Reason, 2003; Schmidt *et al.*, 2002). There is little evidence of the need for distinctive teaching approaches for children with specific learning difficulties although individual differences are crucial here. For example, evidence on the rationale for multisensory teaching is limited, although there are several different teaching approaches now in practice and this is a key area for ongoing research. The key to appropriate teaching seems to lie in careful and ongoing assessment linked with teaching, thus avoiding prescriptive and inflexible programme delivery. Indeed there is much current interest in the identification of literacy difficulties through response to teaching, with various approaches now in development (Speece *et al.*, 2003; Reason, 2003)

3.4.2 Generic metacognitive approaches

The teaching of transferable thinking and learning skills is commonly emphasised in professional guidance (Tilstone *et al.*, 2000). Effective teaching strategies may include the use of 'procedural facilitators' like planning sheets, writing frames, story mapping and teacher modelling of cognitive strategies, although for quality and independence in learning it is crucial to extend these technical aids with elaborated 'higher order' questioning and dialogue between teachers

and pupils (Gersten *et al.*, 2001). Some generic ‘thinking skills’ approaches are now being more explicitly applied to children with learning difficulties, such as the Cognitive Acceleration through Science Education (CASE) programme developed for KS3 by Adey and Shayer. The focus is on developing talking, listening and thinking rather than literacy skills (Simon, 2002:73).

3.4.3 Inclusion, participation and access to learning

Research evidence and professional guidance emphasises the importance of the classroom as a whole learning environment, including the distinctive new developments in ICT (e.g. McKeown, 2000). For example, collaborative team planning has been identified as one of the key factors enabling the development of flexible, inclusive classroom arrangements (Lipsky and Gartner, 1996; Sebba and Sachdev, 1997). Organisational and physical features of the classroom can be distracting and uncomfortable for many pupils, and there is some evidence that certain groups of pupils may need particular attention to learning situations (e.g. those with Fragile X syndrome, Saunders, 1999). Cooperative group learning is known to produce positive academic and social outcomes for pupils in general, but it has been noted in a US review that the direct research evidence for the academic impact on pupils with learning disabilities is somewhat mixed and inconclusive (McMaster and Fuchs, 2002). This is a good example of the need to deal with complex and potentially competing short-term and long-term aims in researching the development of inclusion, especially given the argument that pupils with learning difficulties are likely to need not distinctively different teaching but more practice, more examples, more experience of transfer, and more careful assessment than their peers (Norwich and Lewis, 2001:326).

3.4.4 Interventions beyond the school

Home-school literacy programmes are the best-researched examples of interventions beyond the school. Brooks (2002) found that schemes like Family Literacy can be both educationally effective and cost effective. However, he also notes that partnership approaches with parents, adult volunteers and other children require sufficient training for those acting as tutors.

3.5 Phases of Education

3.5.1 Early Years

Much of the research evidence focuses on overcoming the various obstacles, which may prevent young children from engaging in the essential early learning experiences of play, social interaction and exploration of the environment. Large scale programmes to reduce social exclusion, improve parenting and early years education are clearly relevant here. It is suggested from research that early intervention needs to be embedded in the daily routine, taking account of the child in the family and wider cultural context, and tailored to individual differences and educational needs. Home-school links to reinforce early literacy development are particularly important, and it is seen to be essential to link early identification to intervention and support (Dockrell *et al.*, 2002; Fletcher-Campbell, 2000; Warger, 1999; Wilson, 1998). Some small-scale specifically targeted early intervention programmes have shown promising results – e.g. teaching young children with Down syndrome to read sight words (Buckley, 2000), although further research on these children’s later development of reading comprehension is needed (Fletcher-Campbell, 2000).

3.5.2 KS1/2, KS3 and 14-19

There is insufficient research evidence about the effects of particular strategies at different phases of education. It is more that there is a difference in emphasis in the types of intervention researched. For example, in the primary years of schooling the research focus tends to be on basic literacy and numeracy, speaking and listening, classroom participation, social development, metacognitive development and use of learning strategies. At secondary level there is some subject-related research (e.g. science), research on basic skills teaching, the uses of ICT and the development of thinking skills. However, the general focus of research moves towards the development of more inclusive schools, the self-management of persistent learning difficulties and self-determination.

3.6 Gaps in the research literature

The review points to the following areas that would warrant further attention:

- Interactions between learning difficulties and other factors in children's experience, such as gender, socio-economic status and multilingualism
- Subject-related research beyond literacy, mathematics and science (e.g. English, music, art, humanities and PE)
- Research on practical approaches such as exercise programmes, learning styles and multisensory learning
- Academic interventions at KS3 and above
- The relationships between inclusive school strategies and learning

CHAPTER FOUR: BEHAVIOURAL, EMOTIONAL AND SOCIAL DEVELOPMENT

4.1 Who are the children?

This strand covers a wide variety of needs associated with behavioural, emotional and social development (BESD). It is worth noting from the outset that behaviour can only be understood in the context in which it occurs, and the use of labels or categories to distinguish between children with different kinds of BESD needs is contentious.

That said, for the purposes of simplification, we will be referring in the main to two ‘groups’ of children – those referred to as having social, emotional and behavioural difficulties (SEBD), and those diagnosed as having attention deficit/hyperactivity disorder (ADHD), as a distinction is made between these two groups of children in the literature on teaching strategies and approaches.

In the literature, the term social emotional and behavioural difficulties (SEBD) is commonly used in preference to BESD, to describe the range of children and young people, from those whose behaviour stems from a deep-seated emotional/psychiatric disturbance, to those whose behaviour is more commonly a reaction to outward circumstances (DfEE Circular 9/94). Such difficulties take different forms, including acting out, phobic and withdrawn behaviour. Other common examples include involvement in crime, substance abuse, depression and self-harm (Cooper, 2001).

Attention deficit/hyperactivity disorder is a medical diagnosis that is applied to children and adults who experience difficulties relating to inattention, hyperactivity and impulsivity (American Psychological Association, 1994). Although a separate diagnostic category of attention deficit disorder exists, this report uses ‘ADHD’ as an inclusive term to describe attention deficit disorder *with or without hyperactivity*, since there is little value in distinguishing between the two when discussing teaching strategies and approaches.

Thus, explanatory models of BESD range from the medical to the social. Assumptions about the causal factors of BESD have implications for the types of interventions that are recommended in the literature.

4.2 The nature of evidence

The following points can be made about the current research literature in this area:

- Although there have been numerous reviews of what works in this field in recent years, much of the literature on BESD locates problems *within* individuals rather than using a more context-based approach where behaviour is seen as a response to a particular situation. Nevertheless, there is an emerging literature on systemic approaches (e.g. Gammon, 2003). Despite the current emphasis on inclusion, many responses to children with BESD involve relocation of children in order to provide something different in a separate place (such as pupil referral units and nurture groups). This trend is directly linked to the widespread acknowledgement that children with BESD are the hardest children to ‘include’ (Evans *et al.*, 2003).

- Much of the research in this area is dominated by single-group ABA phase change designs, in which a baseline measure is taken (phase A), a measure is taken immediately after an intervention period (phase B), and a third measure taken following a period of withdrawal for the intervention (return to phase A), See Evans *et al.* (2003), Purdie *et al.* (2002) for further consideration of these approaches. Such designs appear to be implemented to avoid the ethical and logistical dilemmas associated with research involving ‘comparison’ groups. However, it also means that much of the research in this field concentrates on immediate rather than long-term effects of interventions. Rare exceptions to this include Rey *et al.* (1998) and Weiss *et al.* (2000), whose studies included 3-year and 2-year follow-ups respectively.
- Although the three models outlined below have emerged as being most indicative of effective teaching strategies and approaches, this may simply be a reflection of the fact that such models (especially behavioural and cognitive-behavioural) dominate this research field. Thus, rather than having been shown to be ineffective, interventions based on other underlying models (e.g. psycho-dynamic) simply have not been subjected to the same level of systematic evaluation in educational settings (Mpofo & Crystal, 2001).

4.3 Principal theoretical perspectives

Three main theoretical perspectives underpin the research literature:

- **behavioural** models, which use principles of reinforcement and punishment to reduce maladaptive or inappropriate behaviours and increase adaptive behaviours
- **cognitive-behavioural** models, which are an elaboration of learning theory to take account of the capacity of individuals to understand and reflect on their behaviour (in particular focusing on the way internalised speech serves to regulate behaviour)
- **systemic** models, (incorporating eco-systemic) which take account of the organisational context within which inappropriate behaviour occurs and attempt to change behaviour by modifying the context (e.g. arranging the classroom environment to minimise distractions)

These perspectives emerged as being the most indicative of effective teaching strategies and approaches to BESD during the course of the literature review. This was confirmed in two recent reviews, which drew similar conclusions (Evans *et al.*, 2003; Purdie, Hattie & Carroll, 2002).

It should be noted that the medical model assumes a biological or psychological cause for behavioural difficulties and there has been an increasing use of medication (e.g. Ritalin for ADHD) to manage behaviour. While the medical model offers little to teachers in terms of interventions, it is important for teachers to know when pupils are taking medication, as there may be adverse side effects. Children taking medication should be carefully monitored to evaluate the need for dosage alterations, continued treatment and continued effectiveness of the medication in managing symptoms. Few studies have evaluated the long-term effectiveness of psychotropic medications in children and adolescents.

4.4 Some promising teaching strategies

The following points can be made in the light of this review:

- Typically developing peers are a valuable resource either as part of a behaviour management programme (e.g. peer-monitoring) or peer-oriented intervention (e.g. buddy system). For the latter, evidence of improvements in social skills and reduction in levels of peer rejection can be seen in the work of Hoza *et al.* (2000), which used a single-group AB design (pre and post-intervention measures, but no control group). Such evidence has been ratified by other authors in their reviews of research in this area (e.g. McEvoy & Walker, 2000).
- Cognitive-behavioural approaches that encourage children to regulate their behaviour by teaching them self-monitoring, self-instruction, anger management and self-reinforcement skills are effective in producing adaptive behaviour change (e.g. increased on-task behaviour, reductions in anti-social behaviour). This claim is based on reviews which have examined the effectiveness of cognitive-behavioural approaches (e.g. Ervin, Bankert & DuPaul, 1996; Van de Wiel *et al.*, 2002), as well as comparative research articles (e.g. Miranda & Presentacion, 2000; Rey *et al.*, 1998).
- The behavioural approaches of positive reinforcement (where appropriate behaviour is immediately rewarded), behaviour reduction strategies (such as reprimands and redirection), and response cost (a form of punishment in which something important is taken away) appear to be effective in increasing on-task behaviour. This claim is based on reviews of research (e.g. Weiss & Weisz, 1995; Purdie *et al.*, 2002; Root & Resnick, 2003) as well as case-study research (Fabiano & Pelham, 2003).
- Multi-modal research in this field has suggested that combinations of approaches (e.g. cognitive-behavioural *with* family therapy) are more effective in facilitating positive social, emotional and behavioural outcomes than single approaches alone. This has been shown in a variety of contexts, but perhaps most powerfully in the ongoing ADHD multi-modal treatment study (MTA Co-operative Group, 1999; National Institute of Mental Health, 2003), which was a large scale comparative research venture involving nearly 600 children. However, it should be noted that we know relatively little about how different approaches interact with one another.
- For any of the above approaches to be effective, the research suggests that parents need to be actively involved as partners in their child's education, and in presenting a unified front in portraying BESD in terms that provide children with a sense of empowerment. For instance, a review of research has shown parental training programmes produce more effective results than cognitive-behavioural approaches with the child alone (Van de Wiel *et al.*, 2002). Further, a comparative study involving a control group indicated that parental training improved children's academic achievement and reduced maladaptive internalising and externalising behaviour in both the short (1-2 months later) and long (12-15 months later) (Bronstein *et al.*, 1998).

4.5 Phases of education

The research in this area tends to be dominated by work in Key Stages 1 and 2. For instance, of the 74 studies examined in Purdie *et al.*'s (2002) review, 53 involved children of primary school age. That said, there are *some* examples of research in each of the phases of education, and it is possible to provide a limited commentary on the relative effectiveness of different approaches for children of different ages. For instance, Mpofu and Crystal (2001) and Van de Wiel *et al.* (2002) suggest that cognitive-behavioural approaches (see above) are twice as effective with adolescents as with younger children. This claim is based on the argument that younger children lack the cognitive and self-awareness capabilities, which are essential to making good use of 'therapy'. Further, Cowie and Wallace (2000) caution against the use of peer education, mentoring and tutoring approaches with children younger than 11; however, the conclusions reached in the literature are mixed and sometimes contradictory.

4.6 Gaps in the research literature

It is inevitable that there are gaps in the research in this field. In terms of priorities for future research, the review suggests that the following need to be addressed:

- Cognitive-behavioural and behavioural models dominate the research in this area. There is a distinct need for the systematic evaluation of approaches based on other models or theoretical perspectives.
- There is a general lack of long-term follow-up research, which examines the enduring effects (or lack thereof) of different approaches.
- Approaches are rarely used in complete isolation in practice. Research on multi-method approaches needs to be conducted to examine the nature of interactions between intervention strategies (rather than just which combinations appear to be superior to other combinations), and to discover how such 'mix and match' programmes can be best tailored to suit individual needs.
- Many of the approaches in this area are designed in such a way that it focuses on changing 'deficiencies' within the child, and very few have consulted with the children themselves about their views on possible intervention strategies. There is a need for research that focuses on involving children and young people with BESD as active members of the decision making process in designing and implementing teaching strategies and approaches.

CHAPTER FIVE: SENSORY AND/OR PHYSICAL

5.1 Who are the children?

The children referred to in this strand are varied in terms of their impairments and, indeed, in their educational needs. They include many children whose needs can be met with a little adaptation by a mainstream class teacher. However, there are others whose needs are highly complex and who may require some input from a highly qualified specialist teacher.

Many different terms are used in the literature and there are considerable differences internationally. For instance, in the USA the term 'hearing impaired' is rarely used and the term 'hard of hearing' is preferred. The terms 'deaf' and 'hearing impaired' may indicate a 'political' distinction, particularly where 'deaf' is used. Indeed, the capitalisation of 'deaf' to 'Deaf' is often used to imply identification with a Deaf community that has its own linguistic and cultural identity. For the purpose of simplification, the following terms are used here to describe the children in this strand: visually impaired (VI), hearing impaired (HI), multi-sensory impaired (MSI), and physically disabled (PD).

Although, each of these categories carries with it implications for the specifics of effective teaching strategies and methods, within any one sub-category (e.g. HI or MSI) there is also wide variation in the educational needs of the children and wide variation in the detail of specialist teaching approaches reported.

Physical impairments can also be related to medical conditions. Epilepsy, for instance, is an important chronic medical conditions affecting children. Until comparatively recently children with epilepsy were either excluded from mainstream education, or were educated in settings supported with highly elaborate, medical assistance in place. Even now, children often experience restricted curriculum and social access to facilities in mainstream schools (Parkinson 2002, Tidman, Saravavan and Gibbs 2003). However, there is a dearth of evidence-based literature that explores best practice in assessment, access to learning and the curriculum for this group. Neither have there been any recent studies on the effects epilepsy may have on disruption to education, which may affect children to varying degrees, both short and long term (Closs 2000).

5.2 The nature of the evidence

Research in this area can be contentious as advocates of different approaches often dispute the value of other approaches. For example, within the Deaf community there is a longstanding and vigorous debate between advocates of oralism/auralism and signing. The research evidence on the use of these methods does not favour one over the other but shows different effects for pupils depending on such factors as the severity of the hearing loss and the age of onset.

There is relatively little systemic 'hard' research into the efficacy of teaching approaches in this strand. However, there are some exceptions and there is considerable professional knowledge. Fahey and Carr (2002) concur and claim that the relevant body of research literature is small, especially research literature that is evidence-based. McCall and McLinden (2001) state that research in this area (particularly for children who are blind with additional difficulties) still remains sparse. There is even less available research literature focusing on teaching approaches for children with physical difficulties, and similarly there is little high quality research literature (as opposed to the body of professional knowledge) which is available on teaching strategies and approaches children with hearing impairments. There is, however, a small body of literature on

teaching strategies and approaches for children with MSI (including those formally known as deaf-blind).

The main evidence base for this strand draws upon:

- *Case studies or multiple case studies* (e.g. Davis and Hopwood, 2002, VI);
- *Reviews* (e.g. Porter, Miller and Pease, (1997, MSI - deaf-blind), Fahey and Carr (2002, sensory impaired);
- *Expert writings* (e.g. Coup O’Kane and Goldbart, 1998; Webster and Roe, 1998, VI; . Mason *et al.*, 1997, VI; McCall and McLinden, 2001, VI; McCall, 2000, VI, McCall and McLinden, 1997, VI/MSI; McLarty, 1997, MSI;
- *Practitioner accounts* e.g. Blamires, (1999); Rogers and Roe, (1999, VI); Arnold, (2000, VI), McInnes and Treffrey, (1982, MSI); Wright and Sugden (1999, PD);, Closs 2003, MSI, Fox, (2003), MSI, Blamires, MSI, and Fox (2003, MSI - deaf-blind);
- *Small-scale quasi-experiments* e.g. Leybaert and Charlier (1996, HI) and Palmer (2000, HI); and several studies in Fahey, A. & Carr, A, (2002, MSI).

The quasi-experiments reported upon tend to focus on outcomes and approaches in highly specialised sets of circumstances and are based on small sample sizes. These studies are small scale, mainly US focused and related to children with MSI (e.g. Beelman and Brambring 1998, MSI and Sonksen *et al.*, 1991, MSI) and usually have little obvious connection with teaching and learning in the context of the system in England and Wales. Comparative studies of possible competing approaches are negligible in all areas.

5.3 Principal theoretical perspectives

Teaching strategies used with children in this strand have been influenced by several theoretical perspectives, e.g. behavioural, ecological, social-constructivist, deprivation, family systems and humanistic theories of learning (See for instance Mason (1997), in relation to children with MSI).

The *main* theoretical perspectives predominating in the literature base for the sensory and physical impairment strand are social constructivist, behavioural and systemic (eco-systemic).

- ***social constructivist*** – this is the principal theoretical perspective, focusing on ways of improving the quality of interaction, usually through active or participatory learning methods (small group work etc). This approach finds strong theoretical support in Vygotsky’s concept of the ‘zone of proximal development’ in which he states the belief that children will progress to the next stage of expertise in a task through interacting with a more expert partner (McLarty, 1997).
- ***behavioural*** – this involves a focus on ways of reinforcing particular skills e.g. life skills, use of a protractor or other instrument or technology.
- ***systemic (also eco-systemic)*** - this is about creating systems and organising the class and school environment to create an atmosphere that is more conducive to learning (e.g. displays at eye-height for children with VI, accessible classrooms, culture for inclusion).

5.4 Some promising teaching strategies

In broad terms, there are some promising teaching strategies and approaches emerging from the literature. These are typically strategies and approaches which:

- Emphasise the importance of providing opportunities for developing skills
- for social interaction and access to the child's local environment;
- Emphasise the importance of providing opportunities for developing
- skills that promote the child's independence;
- Are structured approaches that reinforce the learning of systematic
- procedures (e.g. the use of a protractor for a child with VI);
- Focus on the adaptation of the environment to increase access to
- and participation in learning;
- Use technology or ICT.

These particular strategies and approaches are expanded upon below:

- *Strategies emphasising the importance of providing opportunity for developing skills of social interaction and access to the child's local environment* (e.g. Webster and Roe, 1998).
 - Participatory/active learning methods tend to impact positively on the child's social and behavioural development (Davis and Hopwood, 2002, VI);
 - Objects of reference (Van Dijk in McLarty, 1997, MSI);
 - Leybaert and Charlier (1996, HI) and Palmer (2000, HI) conclude that deaf children exposed to cued speech, especially if used both at home and at school are more likely to use phonological coding;
 - Greenberg & Kusche, (1998) point to the importance of creating an atmosphere which encourages the integration of emotional and social development with academic and cognitive growth;
 - Wright and Sugden (1999, PD) advocate the role of physical education as a means of bridging the therapeutic/educational divide for pupils with physical disabilities. The authors distinguish between developing movement skills as defined by the National Curriculum PE programme, 'learning to move', and the wider interpersonal and cognitive skills acquired through the relationship between physical movement and interactions, that is 'moving to learn'.
- *Strategies and approaches emphasising the importance of providing opportunities for developing the child's independence* (e.g. Webster and Roe 1998, Davis and Hopwood, 2002).
 - Research has shown that deaf children with the best social and emotional development are those who take part in extra curricular activities (Luckner, 2001);
 - Strategies focusing on developing communication through the use of alternative and augmentative communication (AAC) e.g. Fox (2003, deaf-blind) also Coup O'Kane and Goldbart (1998);
 - Strategies focusing on developing communication through personal agency through, for example, the setting of personal learning targets and the self-monitoring of progress (e.g. Cornwall and Robertson, 1999);
 - Therapeutic approaches have marked a shift away from seeking to remediate deficits towards using the child's own preferences in order to develop functional movement and communication (e.g. Clarke and McConachie, 2001).

- *Structured approaches, which reinforce and contribute to the learning of required systematic procedures e.g. the use of a protractor for a child with VI* (Arnold, 2002).
- *Systemic strategies and approaches, which aim to adapt the environment in order to increase access to participation and learning* (Davis and Hopwood, 2003, many practitioner accounts)
 - The use of classroom amplification programmes in many local education authorities Brett, 2003, HI);
 - Access to the built/ physical environment of the school and classroom (e.g. Davis and Hopwood, 2002, VI); and
 - General literature on inclusion strategies
- *Use of technology*
 - The use of computer software for children with VI has had a marked impact on children's education opportunities;
 - There has been an increase in the number of young children receiving cochlear implants (Pisoni, Cleary, Geers & Tobey, 1999);
 - The development of enabling technologies to support these processes (Blamires, 1999).

Issues relating to teaching strategies and approaches

- Children with more severe or complex forms of MSI, have more in common with children with SLD (or PMLD) than with the other children with physical and/or sensory impairments. This may be because these children share a limited experiential base resulting from the complexity of the disability (because they are less able to explore and make sense of the world around them) which can hinder the development of language, symbolic play and non-verbal communication, and prevent children from developing adequate cognitive, communication and social skills. In some cases this can lead to emotional and behavioural problems, relationship difficulties and a restricted lifestyle.
- For most children in this strand, there is a need for a mixture of specialist teaching and the use of systemic methods, which increase the child's access to participation and learning.
- For children with physical disabilities (but without significant additional difficulties) much can be achieved through the use of technology, equipment and an accessible school and classroom layout.

5.5 Phases of education

- *Pre-school* - The evidence supports early intervention, also stressing the importance of interagency co-operation. A longitudinal study by Yoshinaga-Itano (2003) describes the Colorado Home Intervention Programme and concludes the diagnosis of hearing loss with the first few months of life allows the opportunity to begin early intervention.
- *KS1&2* - This is the most commonly researched phase of education, although studies tend not to fit neatly into this classification.
- *KS3 & 14-19* There is a significant *gap* in research evidence for these groups, although general documentary accounts would suggest an emphasis on a systemic approach might prove successful. It should be noted that teaching strategies and approaches found to be effective for children in KS1 & KS2 may well be effective for older children. Further research is needed.
- Typically, the older the child/young person (or the less the severity of the impairment/disability) the more the emphasis there is likely to be on systemic approaches focusing on ‘access’ to the curriculum rather than on specialist teaching.

5.6 Gaps in the research literature

The review suggests there is a need for further research:

- on the quality of children’s participation in lessons and to provide evidence of their learning.
- on the efficacy of a multiple approach strategy (e.g. active or participatory learning methods, behavioural approaches, multi-sensory approaches and eco-systemic approaches); for example, Paul (1997) states that ‘there are no best methods for teaching students who are deaf or hard of hearing to read, and becoming fixated on one technique is not only unsupported by research, but also might be detrimental to students’ progress. Whilst Nelson and Cammarata (1996) suggest that ‘rather than adopting single strategy solutions, we need to search for tricky mixes of instructional strategies (that address the unique learning needs of deaf students).
- across all phases of education.
- evidence on the effectiveness of early intervention strategies for those children with more complex needs or disabilities.

CHAPTER SIX: DISCUSSION AND CONCLUSIONS

6.1 Commonalties across strand reports:

- There is wide variation in the educational needs of children and a growing understanding of the need to move away from the belief that one model of learning informs and justifies one model of teaching.
- A range of theoretical perspectives underpins research in each of the strand areas however there is considerable overlap with behavioural, cognitive behavioural, social constructivist and systemic (eco-systemic) approaches dominating the intervention literature. At the same time there is an increasing understanding of psychological and educational connections between different theoretical approaches to teaching and learning, and between social, emotional and cognitive aspects of educational experience.
- Teaching strategies and approaches are associated with but not necessarily related to categories of special educational need (e.g. autism, learning difficulty, etc), however there is an increasing understanding of the differentiated learning profiles of certain groups of children (e.g. children with Down syndrome), whilst also acknowledging substantial individual differences within these groups.
- Across all areas of special educational needs there was variety in the research methods used. With notable exceptions, studies were often based on small scale, qualitative inquiries, such as case study and professional practitioner accounts. Differences between the profile of the type of evidence associated with each strand has much to do with the development of research in the strand area, as well as to the nature of the ‘special educational need’ under investigation.
- There is little research that takes account of the diversity of contexts in which the strategies and approaches for teaching children with special educational needs need to be applied. By diversity of contexts, we mean schools operating in very different circumstances and facing a range of challenges related to the local socio-cultural conditions, e.g. schools facing challenging circumstances, schools with a high proportion of children from various ethnic minority groups etc. This is particularly important if we are to increase our understanding of how to replicate success initiatives more effectively in schools.
- However, there is an increasing acceptance of the need to locate the education of children with SEN within inclusive policy and practice, with emphasis on improving the whole learning environment and the combination of teaching and learning processes applicable to all children; an approach that may prevent some children from developing SEN in the first place.
- Across all areas of need, research tends to be undertaken with younger children. We found insufficient evidence about effects of various strategies at different phases of education although there was strong evidence in support of early intervention across all areas of need. With the exception of social and emotional development, and research on self-determination, few studies focused on older learners.

6.2 Synthesis of Strand Reports

Consideration of the strand reports permitted a synthesis of the findings on effective teaching strategies and approaches across all areas of special educational needs and disability. In the second phase of the study, reported here, we consider the extent to which these four areas of need are helpful or sufficient in furthering understanding about teaching pupils with the full range of special educational needs.

6.2.1 Evidence on Teaching Strategies and Achievement

A central issue we considered was the relationship between learning and teaching, whatever category or type of SEN may be identified for individuals and groups of pupils. Our review identified many teaching approaches and strategies identified in the literature on pupils with SEN, but theoretically there are fundamental differences in the approaches to understanding learning. Debates continue about whether, say, behaviourist techniques for teaching may be appropriately used within a constructivist teaching environment, given their opposing views about the degree to which pupils are actively involved in the learning process.

However, from an educational perspective, it can be argued that there are in practice connections between achievement, active learning and participation (Kershner, 2000). For example, most teaching programmes now actively involve children in setting targets and monitoring their progress, thus promoting the children's awareness and control of their own learning. In practice, a classroom designed to promote pupils' overall participation in active learning will justifiably incorporate a number of different teaching strategies directed towards different stages or aspects of learning.

There is a growing understanding of the need to move away from the belief that one model of learning informs and justifies one model of teaching. Structured behavioural techniques, for example, are just one set of skills available for selection by teachers according to an assessment of children's overall needs (Farrell, 1997). Reason (2003) found that the more effective interventions for teaching reading are those which have a more comprehensive model of reading and therefore a more complete instructional approach.

Our review found that there is evidence that a multi-method approach is promising. Research on the efficacy of multiple approach strategies tends to report that a combination of strategies produces more powerful effects than a single strategy solution (Speece & Keogh, 1996; Nelson and Cammarata, 1996). As a result, we would suggest that the strategies identified during the course of this review might be usefully organised according to Kershner's (2003) typology as those which are concerned with:

- **Directly raising attainment** (e.g. using task analysis and target setting, with associated guidance, prompts and other supports to reach specified objectives and demonstrate success); and **access strategies** directly relating to attainment (e.g. teaching relevant ICT skills to overcome literacy difficulties and allow entry into learning across the curriculum)
- **Promoting 'active learning'** (e.g. modelling appropriate learning strategies, developing thinking skills, metacognition (i.e. awareness and control of learning strategies), reflection and creativity; employing investigative and experiential approaches, etc.); and **access strategies** relating to active learning (e.g. promoting language development and observational skills, self-assessment and response partner systems; facilitating choice and risk taking in learning, play, drama and simulations; making explicit links between out-of-school knowledge and school learning, etc.)

- **Promoting participation and engagement** (e.g. facilitating collaborative learning and peer tutoring; engaging in ‘real-life’ problem solving, emphasising the use or application of knowledge for ‘real life’ purposes and citizenship; apprenticeship models for learning in sports, creative arts and literacy; using mentoring schemes, artists/writers in residence and visiting speakers with work-related expertise; etc.); and **access strategies** for participation and engagement (e.g. authentic assessment, enhancing self-esteem, emotional growth and motivation; attribution retraining (i.e. locating causes of success and failure as within pupils’ control); developing social skills, teamwork and friendships; establishing supportive whole-school ethos (e.g. seeking out and valuing pupils’ opinions and contributions); forging community links etc.)
- **Responding to personalised learning styles and preferences** (e.g. visual / auditory / kinaesthetic modes of learning; orientation to study (such as deep / surface approaches); concrete / abstract / active / reflective thinking; multiple intelligence, etc.) Such a personalised approach allows for children to obtain individualised support as required. It is also consistent with the new understandings of teaching diverse groups of learners.

The theoretical roots for each of these approaches to enhancing *achievement*, *active learning*, *participation* and *responding to individual differences* can be found in the various models of learning and development discussed above. ‘Achievement’-focused approaches in SEN are largely drawn from behaviourist models of learning in which attention is paid to the observable outcomes of learning. Teaching approaches focusing on ‘active learning’ and ‘participation’ gain theoretical support from constructivist models of learning. Teaching which focuses on ‘individual differences’ (such as learning styles), relates more to the ways in which new information is handled and learning challenges are tackled than to fundamental beliefs about the nature of learning. The identification of individual differences in preferred learning modes and styles has seemed in the past to be a very promising way forward for effectively matching teaching to learners. However, as Tunmer *et al.* (2002) note, there are two problems in searching for this interaction. First, the evidence is as yet relatively weak, and, second, there are no identifiable learning experiences which call on only one mode of learning.

6.3 A question of pedagogy

Alexander (2003) argues that pedagogy “is what one needs to know, and the skills one needs to command, in order to make and justify the many different kinds of decisions of which teaching is constituted. At its most basic and fundamental level this involves

- *children*: their characteristics, development and upbringing
- *learning*: how it can best be motivated, achieved, identified, assessed and built upon
- *teaching*: its planning, execution and evaluation, and
- *curriculum*: the various ways of knowing, understanding, doing, creating, investigating and making sense which it is desirable for children to encounter, and how these are most appropriately translated and structured for teaching” (p. 4).

Consideration of the evidence of whether there is or should be a SEN pedagogy was undertaken by the team during the synthesis of area strands and during the team meetings held in September. We found that there is a great deal of literature that might be construed as special education

knowledge but that the teaching approaches and strategies themselves were not sufficiently differentiated from those which are used to teach all children to justify the term SEN pedagogy. Our analysis found that sound practices in teaching and learning in mainstream *and* special education literatures were often informed by the same basic research (e.g. Heward, 2003). Some of the research that underpins the National Literacy Strategy for example was based on studies that sought to understand the differences between readers with and without special educational needs. Similarly, there are strategies that have proved to be effective for teaching academic skills to pupils with learning difficulties even though they were developed for other purposes. Co-operative learning is a well-known example of a mainstream practice that has had positive effects on attainment for pupils with special educational needs.

6.3.1 A question of special educational need

That there are differences among children, their characteristics and upbringing may not be problematic. It is when the magnitude of these differences exceeds what schools can accommodate that children are often considered to have special educational needs. As Florian and Hegarty (2004) note:

the term SEN covers an array of problems from those arising from particular impairments to those related to learning and behavioural difficulties experienced by some learners some of the time...Many people are disabled by an impairment but they may or may not be *handicapped* by the condition...However, there are some conditions and impairments that are known to create barriers to learning unless accommodations are made. A person with a visual impairment, for example, may need **some kind of support or accommodation** to achieve the same functioning as the person without the visual impairment...The term special education is often used to refer to the process of making such accommodations (emphasis added).

Our conclusion is that this process of making accommodations does not constitute pedagogy but is an element of it. Our view is that questions about a separate special education pedagogy are unhelpful given the current policy context, and that the more important agenda is about how to develop a pedagogy that is inclusive of all learners.

This is supported by the evidence base in relation to each of the four strands in our preliminary report where the literature on teaching approaches and strategies for meeting special educational needs was organised according to the areas of need as specified in the 2001 SEN Code of Practice. There was difficulty in categorising many of the reviews located as there was a considerable overlap between area of need, teaching approach, and teaching strategy. When we searched by teaching strategy many relevant reviews that covered all areas of need were found. Our position is that the areas of need are important elements of human development for all learners. Moreover these elements interact in ways that produce individual differences which make it difficult to prescribe a course of action to remedy a particular problem. Often children with complex learning needs require support to a degree which is beyond that typically required by their peer group.

Our view does not diminish the importance of special education knowledge but highlights it as an essential component of pedagogy. Davis and Hopwood (2002) have shown how the provision of additional support can lead to inclusive practice. This is most likely to occur when specialist and mainstream staff work in partnership sharing their knowledge and diversifying their roles. Ainscow (1997) identified effective leadership, involvement of staff, a commitment to collaborative planning, effective co-ordination strategies, attention to the possible benefits of

enquiry and reflection and a policy for staff development as conditions for inclusive education. Florian (1998) has suggested there are a set of necessary but not sufficient conditions which must be met for inclusive education to become a meaningful model for meeting special educational needs. These are:

- an opportunity for pupil participation in decision-making processes
- a positive attitude about the learning abilities of all pupils
- teacher knowledge about learning difficulties
- skilled use of specific teaching methods
- parent and teacher support (p.22)

Both sets of conditions represent important constituent elements of pedagogy. They underscore the social complexity of teaching and the change in thinking and practice that is required in order to make use of available teaching strategies and approaches. Harkin and Davis (1996) point to the difficulties that many teachers' face when attempting to change long established patterns of classroom behaviour, and to the benefits of collaborating with colleagues who act as critical friends as a means of encouraging reflection on practice and experimentation. In the following section we consider how the findings of the scoping study might become embedded in every day teaching practice.

6.4 Making use of best practice knowledge

Research and experience indicates that a simple theory-to-practice model fails to take account of the ways in which teachers do their work in regard to the complexities of the social and organisational relations in the wide variety of situations they face daily. Furthermore, we are conscious of the ways in which local context influences the way techniques are interpreted, adapted and implemented. Realistically, therefore, it is argued that research that points to what seem to be 'promising approaches' can not prescribe simple solutions for what are, by their nature, complex problems. Rather, evidence from research can be useful in directing and stimulating teachers to reflect upon existing practices and to experiment with new approaches.

This is not to suggest an eclectic approach to teaching and learning in which 'anything goes'. Rather we agree with those commentators (e.g. Speece & Keogh, 1996) who suggest that the theoretical models which give rise to different teaching approaches and strategies may not be as disparate as initially thought. Behavioural, social constructivist and ecosystemic approaches to teaching and learning all contribute to pedagogy. The question is no longer which approach is best but how can we apply what has been learned from each of these models in ways that produce positive outcomes such as increased attainment and achievement?

Although it is not difficult to find studies of various types of strategies that have been shown to influence attainment of both academic and social outcomes, it is not clear how these same results can be obtained when the interventions are implemented locally by teachers in schools. The history of developing empirically based teaching strategies and interventions that are effective for pupils with SEN suggests that we know much more about practices that are effective than we do about how to influence their long term adoption and sustaining teachers in new ways of thinking about teaching and learning. Experience has shown that importing techniques that require high levels of attention to individual pupils is often unrealistic. Furthermore, the reliance on such approaches has tended to reinforce the belief that pupils with certain characteristics cannot be taught in ordinary school settings. On the other hand, research in schools that have

become more inclusive suggests that they have found ways of planning lessons and mobilising human support resources that help to personalise (rather than individualise) common learning experiences. Expert teachers who respond to the diversity of learners needs found in every classroom, but especially in classrooms with a high proportion of children with special educational needs, have been found to embed a responsiveness to individual need within the context of whole class teaching (Jordan and Stanovich, 1998). What is not well understood is how they do this – what resources they draw upon and what tacit knowledge enables them to respond effectively to pupils who experience difficulty in learning.

Studies of how teachers work, how they apply their craft knowledge suggests that teaching is not a technical or rule-following activity but one which involves making judgements and taking decisions, based on analysis of what Schon calls ‘reflection-in-action’. Teachers do not follow a single method but they draw on their knowledge and engage in what Huberman (1993) and Hargreaves (1997) call ‘tinkering’. In other words, they often experiment and try out ideas possibly informed by knowledge that they have about the range of theories and ideas that are available and guided by their own beliefs and principles.

Dyson and Ainscow (2003) have shown that local context also influences the way teaching strategies are interpreted, adapted and implemented. Their experience is that evidence from research can be useful in stimulating teachers to reflect upon existing practices and to experiment with new approaches. Florian and Rouse (2001) found school structures to have an important influence. Their study investigated teacher *knowledge and use* of the strategies thought to promote inclusive practice. They found that contrary to the literature which suggests that teachers lack knowledge about inclusive practices, they were actually quite knowledgeable, but that *knowing* and *doing* were very different things. What teachers were able to do was constrained by such things as subject department and school policy (e.g. setting), and the availability of resources (e.g. ICT, teaching assistants, etc.). Attempts to trial new approaches must, therefore, pay attention to contextual factors, including the way practice develops within social contexts.

What we have learned from this and other research undertaken within our teams is that research to practice issues are nested within a wider set of considerations. The limited research on implementation suggests that the adoption of innovative or effective practice is effected by such things as:

- time to work on the innovation;
- philosophical acceptance and perception of the importance of the intervention practice, and
- teachers’ perception of their technical competence and ability to influence student learning.

A pervasive theme in the implementation literature is the mismatch in perspective between researchers and practitioners. New research on innovation (i.e. how teachers adopt technology) suggests that simply because a programme or approach has been validated by the literature does not mean it will be used as intended in practice (Woodward, Gallagher and Reith, 2001). How teachers use empirically validated strategies is not well understood but some researchers – ourselves included - now recognise the need to incorporate ways of examining the complex and non-linear patterns of teachers’ work in their research designs.

6.5 Recommendations for future research

We recommend that future research in this area explores the following wider considerations and how they affect the capacity of teachers and schools to teach pupils with the diverse range of SEN. It should consider how teachers and schools can be supported in implementing evidence-based strategies built upon a pedagogy which combines theoretical insights from a range of learning theories with knowledge of children, assessment and curriculum.

Although some of the approaches we have identified do not have a strong evidential base as yet, they are seen as having considerable potential to enhance learning. For example strategies for all pupils which may currently be seen as promising in certain contexts include: developing thinking skills, responding to learning styles and multiple intelligences, using ICT to support learning, listening and responding to pupils' views, developing peer tutoring and group work, enhancing motivation and self-esteem, enhancing the role of the creative arts, incorporating so-called 'authentic' learning experiences, linking learning in school with learning outside school and the re-establishing the role of extra-curricular activities such as sport, clubs and outdoor activities. While innovative strategies for certain groups of pupils with SEN might include: specific planning and teaching for pupils with dyslexia, using social stories for autistic spectrum disorders (ASD), more specific uses of ICT or counselling. There is a need for further systematic research across all these areas.

Future research in this area should involve systematic, long-term development work across a range of sites and settings, which also allows for the examination of the impact of the innovations upon achievement. Such research is necessary if we are to advance knowledge about teaching and learning to understand how *combinations of teaching approaches* or what we have called 'multimodal approaches' might be used in different contexts and for different purposes. To do this it would be important to consider teaching and learning in real settings in order to take account of the ways in which teachers do their work in relation to the wide variety of situations they face.

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APPENDIX A

Method

Method

This was a collaborative project between the universities of Manchester and Cambridge. Cross-university teams were organised around the four areas of need specified in the SEN Code of Practice.

Our search strategy relied on three main sources of information:

- professional knowledge and bibliographic input from team members
- online searches of relevant databases
- library catalogue searches

Each source is described below:

i. Professional knowledge and bibliographic input from the research team

The main source of information and analysis is a product of the strength of expertise that we have within our team. Colleagues with expertise in particular areas of special educational needs or disability wrote briefing papers summarising, synthesising and analysing the literature in their areas. These ‘stand alone’ papers, addressed research questions one to three in a range of areas e.g. dyslexia, dyspraxia, visual impairment, hearing impairment, autism, ADHD, speech, language and communication needs, severe learning difficulty etc.

Project directors and strand leaders recommended relevant references across all four areas of need as well as literature on effective strategies for teaching pupils with the full range of special educational needs.

ii. Online search of relevant databases

A range of databases were searched from several different perspectives:

- Pupils with various types of special educational needs
- Particular teaching approaches and specific programmes for raising achievement
- Strategies aiming to promote inclusion and self-determination
- Alternative theoretical views of child development, learning and teaching

The searches included literature reviews conducted from 1995 to the present, as well as certain key texts published earlier. We also examined first-hand reports of relevant empirical studies, digests of research findings and other information about effective teaching approaches. The balance of findings from different sources has varied considerably between the four strands and between different special educational needs, depending on the current state of play of the research.

The following databases were searched:

BEI (British Education Index)

ERIC (Educational Resources Information Center)

NFER/CERUK (Current Educational Research in the UK),

AEI (Australian Education Index),

Education-line

PsycINFO

In searching these databases we were mindful of the problems identified by Evans¹, Harden, Thomas and Benefield in their 2003 EPPI review of support and intervention for pupils with emotional and behavioural difficulties in mainstream primary school classrooms. Notably, that lists of search terms are not standardised and databases themselves are organised differently making it impossible to use search terms consistently. To this end we developed a list of key words based on those identified in relevant thesauri, our knowledge of database organisation and international terminology. The following list of keywords was used in various combinations, initially with the primary specification of ‘review’ or ‘meta-analysis’, and then without this specification depending on our preliminary analysis of the availability of specific literature.

- review / literature review / meta analysis

AND

- teaching strategies/methods / approaches/ *and variants*

AND

- special educational needs / *and variants*
- disabilities / *and variants*
- learning difficulties / *and variants* (including the US term ‘mental retardation’)
- emotional, behavioural, social difficulties / *and variants*
- physical and sensory impairment / *and variants*
- dyspraxia / dyslexia / autism / ADHD / *and variants*
- communication / speech and language difficulties / *and variants*

The searches were further refined with reference to the following key terms, singly or in combination:

- preschool education / primary schools / secondary education / postsecondary education / *and variants*
- specific teaching strategies and programmes such as conductive education / augmentative and alternative communication / peer tutoring / etc.
- learning processes, including metacognition / mnemonics / etc.

¹ Evans, J., Harden, A., Thomas, J. and Benefield, P. (2003) Support for pupils with emotional and behavioural difficulties (EBD) in mainstream primary school classrooms: systematic review of the effectiveness of interventions, London: EPPI-Centre and NFER.

This search resulted in the identification of over 400 reviews, research articles and other references. This list was scrutinised by team members who were able to eliminate those that did not include an emphasis on teaching strategies or approaches, those that were redundant with similar reviews by the same authors, or those that were obscure (e.g. unpublished papers). These lists are to be linked with the bibliographies provided by the special educational needs and disability experts to create the full bibliography.

iii. Library catalogue searches

The University of Cambridge library is one of the few copyright libraries in the country. Its extensive holdings were searched using the Newton Library catalogue and this process enabled us to locate most of the references identified during the online search. Sources not available at Cambridge were tracked down using the library search engines of Manchester, Birmingham and London universities. The few remaining reviews were located via colleagues at the University of Edinburgh, and at Vanderbilt University and the University of Maine in the USA. Recent issues of some key journals were hand-searched – including the European Journal of Special Needs Education; Educational

Psychology in Practice; Educational and Child Psychology; and others. Other sources, such as the on-line Times Educational Supplement, the DfES site, and the NASEN research database were also browsed for relevant references.

Data Collection

To avoid overlapping and multiple searches using identical criteria, we kept a log of all searches specifying date, search engine or database, keywords and number of entries found.

The entries were reviewed by strand leaders and their teams, and posted on a secure website to enable remote access to a single source by all team members. The website allowed all members of the research group to send in request forms for a reference or information to be added or modified. This information was updated daily to enable us to track the organisation and reading of the literature.

The main database currently includes a combination of empirically-based research articles, research reviews, and professional guidance – all of which provide evidence about the efficacy of a range of interventions for pupils with special educational needs in different phases of education. We have deliberately not limited our database to large-scale, quantitative, quasi-experimental studies, partly because there are few available in education, as the recent EPPI reviews have documented. In this context such studies may assume an unjustifiable authority if they have not been subject to appropriate randomisation and validation in a range of educational contexts (Cohen² et al, 2000: 217). We did not want to limit our survey to a small set of quasi-experimental studies which do not fully cover the range of strategies and approaches known by practitioners to support pupils with special educational needs. Our position is that many effective teaching approaches have not yet been subjected to this controlled type of evaluation. In addition, there are other research methodologies that produce robust findings and we did not want to exclude them from the scoping study.

² Cohen, L., Manion, L. and Morrison, K. (2000) *Research Methods in Education*, 5th ed., London: RoutledgeFalmer.....

APPENDIX B

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