Early Years Research: Pedagogy, Curriculum and Adult Roles, Training and Professionalism

by

Members of the British Educational Research Association Early Years Special Interest Group

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I. THE REVIEW PROCESS

INTRODUCTION

The foci of the research review
In this document members of the British Educational Research Association's Early Years Special Interest Group (BERA SIG) present a literature review of some of the research relevant to their specialist area.

The 'Early Years' of childhood are internationally recognised as being from birth to eight, and although some of the work presented here is concerned with children within those full age ranges, the majority of the report focuses on research about provision for children aged between three and six years. This focus was hotly debated when the SIG members came together for the first time to work on the task of the review, since it was felt that to leave out any age group within the definition of 'early childhood' might be interpreted as regarding those children (usually under threes) as less important educationally. On the contrary, the group members welcome the new Government interest in under threes and the 2001-2002 project, led on their behalf by Professor Lesley Abbott, exploring ways of developing effective practice with this age group. However, the extensive nature of research evidence about under threes – termed 'infants' by psychologists – from developmental and cognitive psychology and other relevant disciplines would have made the work far too broad for this first Early Years SIG review.

Like the House of Commons Select Committee (1988-89) and the OECD (2001), we see settings attended by young children as providing both care and education, because for this age group the two processes are inseparable. The majority of the research reported upon here concerns group settings outside the children's homes, because by and large these are the sites where studies of published research were conducted. The few recent studies of children learning in their own homes tend to be case studies of the acquisition of language and literacy skills, for example, but very few have been sited in childminders' homes. Additionally, the group recognised that not only did the age range to be covered present challenges, the amount of research available demanded a narrowing of focus in order for the review process to be manageable.

Thus the group decided to focus on three main areas:-

- pedagogy
- curriculum and
- adult roles, professional development, training and the workforce.

Further, this review focuses on practice rather than policy research.

As a result, the group has identified not only notable research omissions in the areas reviewed, it also highlights the need for more early years policy research, particularly at a time when there are so many different initiatives and developments. Many of these are currently being evaluated in terms of 'effectiveness' measures but there are few examples of research analysing policy (however, see for example, Lubeck and Jessup 2001; OECD 2001; Valiente 2001).

The research questions identified
Several seminars hosted at SIG members' institutions and at BERA AGM conferences were used to discuss and plan the content of the acreview and to agree a process. At the first event the group identified the following questions:-

- What do we know about how young children engage with curricula in educational settings?
- What do we know about how adults promote young children's learning in educational settings?

The review process
Three working groups were formed to contribute to the main sections of the text and one editor took responsibility for each of those sections. This meant it was imperative the members of all three groups agreed the criteria against which to assess research reported in the public domain which would contribute to the academic review..

To this end, articles about assessing research and conducting literature reviews were read and discussed (for example: Bassey 2000; Davies, 2000; Eisner 1998; Harlen 1997 and 2000; Meade 2000; Slavin 1986; Sylva 1999). Following support and guidance at one Early Years SIG event by Professor Ann Lewis, co-author with Professor Brahm Norwich (2000) of the BERA review '*Mapping a pedagogy for special educational needs*', it was agreed that each subgroup follow a process of charting identified sources against the criteria derived from Slavin (1986) and Eisner's suggestions as outlined by Meade (2000), using the grid in Figure 1.

Figure 1: The grid

Field/ Domain being reviewed:- ……..

No.	Full reference – title, etc	Quantitative	Qualitative	Mixed (state paradigms)	Slavin's criteria	Eisner's criteria
					*1,2,3,	*1,2,3,4,5,6,7,8

Slavin's (1986) criteria were:-

- the research is germane to the issue being reviewed
- it is based on a research design which minimises bias
- the research has external validity.

Eisner / Meade (2000) criteria were:-

1. the philosophic position of the researcher is clear
2. theoretical constructs and units of analysis are identified
3. the nature and extent of the sample is described and justified
4. the arguments are based on data and are logical
5. there is sufficient evidence (eg. from triangulation where the sample is small)
6. standards of judgement have been rigorously assessed by others
7. generalisations have not been attempted where inappropriate
8. the work has been published and subjected to public scrutiny as a result.

These criteria were to be used to ensure the inclusion of only the most 'robust' research. However, they instigated paradigmatic debates among the group, adding to the usefulness of the process in terms of group development and a deepening of understanding of many of the difficulties we face when seeking to share research with each other and the wider world.

Each subgroup compiled a set of key terms which were to be used for their data base searches. They also identified key journals which would be likely to contain relevant articles. For example, data bases used included :- the BEI (British Education Index); OVID; ASSIA.; examples of key journals targeted are :- the *British Educational Research Journal, Childhood Education, Early Child Development and Care, Early Education and Development, Educational Researcher, Early Years Educational Research Journal, Education 3-13, European Early Childhood Educational Research Journal, International Journal of Early Childhood, International Journal of Early Years Education, Journal of Research in Childhood Education, Oxford Review of Education*. Additional advice was sought from academics outside the group who were known for their work in specialised research areas**.**

The next phase of the process involved the data base searches. Members of the group brought to bear their years of experience in the field in meticulously reading through the abstracts of all potential research articles and reports. Their experience of research and scholarship was also brought into play, as well as the agreed criteria, when subsequently reading the articles selected for inclusion. At this point it was important for the subgroups to maintain their foci. The huge amount of potential material in the field of early childhood education research meant that some areas could not be covered, despite their importance. Further it was agreed that the review would have to be limited, focusing mainly upon British research conducted during the previous decade. The reviewers did not set out to cover topics such as the role and involvement of parents; policy research; cross cultural studies, except where they have been pivotal in informing the British scene; nor does the review give a full account of pedagogy and curriculum relating to Early Childhood Education and Care (ECEC) in the years from birth to three, although some of the recent research regarding this age group is considered in the section on adult roles, and the curriculum section was annotated by a specialist in the care and education of children under three. A review of the literature about children from birth to three, instigated by the DfES project *Birth to Three Matters* led by Professor Lesley Abbott at Manchester Metropolitan University, is currently in press (David et al in press).

Having explored and assessed the abstracts and titles of material which fulfilled the criteria of relevance and were concerned with recent British research, these were printed off and the full articles located and read by members of the group. Unless there was a serious doubt that the work did not come close to fulfilling the rigorous research criteria, those publications which provided the 'best evidence' were included in the review. Thus the scope of the review was refined at successive stages. Each working group drew up recommendations based on members' analysis of the research reviewed and in turn these are synthesised in the conclusions in Section V.

We do not claim that the review is comprehensive, particularly as it does not include unpublished reports, articles from professional journals where the underlying research process is implicit, or other documents to which the group did not have access, as we reviewed only material which would be in the public domain and thus accessible to readers who might use our review to trace references.

Circulating the review to SIG members and two reviewers

In the final stages, the text was circulated among SIG members, for corrections, omissions and comment. One SIG member provided very helpful, critical comment from members of the voluntary body (the PLA – Preschool Learning Alliance) for which she works as a researcher. Two colleagues who had not taken part in the process were then asked to act as referees and to provide feedback. This collaborative process throughout was intended to lead to a final text which not only served the purposes of BERA but which would stimulate further thinking and research in the field of ECEC. The text will also form the basis of a shorter, user review to be written by Tricia David for practitioners and policy makers.

The three sections which follow present 'best evidence' about *pedagogy*; *curriculum and assessment*; and *adult roles, training and professionalism*. The fifth and final section of the review is a brief statement of the conclusions and recommendations which we can draw on the basis of the work reviewed here, together with any emerging issues and ideas for future research.

RESEARCHING EARLY CHILDHOOD EDUCATION AND CARE

During the last twenty years the number of those in the field of ECEC involved in research in this country and throughout the world has grown as rapidly as the field itself. Before 1980 most research into ECEC was conducted by developmental psychologists rather than by educationalists. Further, the field continues to be highly multi-professional and multi-disciplinary. ECEC researchers have a responsibility to address a wide community, often including parents. Early years researchers also recognise that owing to the vulnerability and issues of power relating to babies and very young children, they must be rigorous about not only ethical aspects of their work but also the appropriateness of the whole process. Thus there is an increase in debate about research methodology and its development for this field (see for example: Aubrey et al 2000; Aubrey 2001; MacNaughton et al 2001; Penn 2001).

Internationally, the OECD (Organisation for Economic Cooperation and Development), a 'club' whose members tend to be the richer nations of the world, suddenly became interested in early childhood and its importance in relation to the development of lifelong learning. The resulting survey (OECD 2001) of provision for young children in 12 countries includes comment upon the contribution of research to policy and practice in each of those states. The OECD concludes that at present insufficient is spent on research in every one of the twelve countries and that at present it is dominated by work which espouses one particular research paradigm.

Educational Research in general has been criticised during the last five years (see for example Hillage et al 1998; Tooley and Darby 1998) on a number of counts, but in particular for its failure to impact on the field, so influencing practitioners and policy makers. Initiatives such as the BERA academic and user reviews are intended to contribute to the different ways in which researchers share their experience and expertise, as well as promoting dialogue among these groups.

II. PEDAGOGY

INTRODUCTION

As the term 'pedagogy is by no means universally used by early years researchers or, indeed, even defined in the same way, this creates some difficulties for carrying out a systematic review of the chosen topic field. With respect to primary-aged children, David McNamara (1994: 6) has suggested that the notion of pedagogy has a 'hostile tone with implications for pedantry, dogmatism or severity' and noted that it is worrying that the word, traditionally employed to signify the art and science of teaching, should carry negative associations. Mortimore (1999) has described pedagogy as a 'contested' term with 'changing connotations and pressures', more common in other European countries, in particular, in French, Germany and Russian-speaking academic communities. He has taken the view that it is helpful to define the term in a way that takes the learner into account, otherwise it would be better described under the more limited term of 'didactics'. His preferred definition is 'any conscious action by one person designed to enhance learning in another (Mortimore 1999: 3).

Siraj-Blatchford and Sylva (2002) in their recent DfES-sponsored study of effective pedagogy in the early years, have taken a similar view, suggesting that effective pedagogy is both 'teaching' and the provision of instructive learning environments and routines. This definition, thus, provided both a suitable starting focus and a reminder that keyword searches would need to include 'teaching', 'instruction' and 'learning environments', as well as 'pedagogy'.

ISSUES OF THEORETICAL CONCEPTUALISATION

Singer (1993) has noted, however, that 'pedagogies of childhood' are not reducible to scientific enquiry alone, since they are framed within cultural values that can best be addressed when the researcher's own position is made explicit. As she pointed out, child development theories are presented as objective and universal and 'very often we are unaware of just how deeply our theories, concepts and research questions are anchored in moral and social-political choices and problems' (Singer, 1993:130).

Researchers from the US, for instance, have been concerned with fundamental issues to do with the nature of learning, schooling and knowledge, and the relationship between theoretical understanding and educational practice (Alexander 2000). Greeno et al (1996) have argued that there are distinct traditions in educational theories and practices that derive from differing perspectives on the phenomena of the domain. The perspectives correspond to three general views of knowing and learning in European and North American thought derived from Case (1991; 1992) and Packer (1985), referred to as *empiricist, rationalist* and *pragmatist-sociohistoric*. The empiricist perspective, exemplified by Locke and Thorndike, emphasises the consistency of knowledge with experience. The rationalist perspective, typified by Descartes and Piaget, emphasises conceptual coherence and formal criteria of truth. Pragmatism, typified by Dewey and Mead, and sociohistoricism, typified by Vygotsky, emphasises that knowledge is constructed in practical activities of groups of people as they interact with each other and their material environments. These three perspectives correspond with current behaviourist, cognitive and situative views and may, according to Bereiter and Scardamalia (1996), carry basic conceptions of what good teaching should be. Whilst certain interpersonal, managerial and performative aspects may be common to different instructional approaches, personal thinking and beliefs concerning the way learning is fostered and views concerning teaching will be different. It is generally accepted today that children's learning is active, self-regulating, constructive in problem situations and, is related to existing knowledge as they act upon their environment. In contrast to this view, Bereiter and Scardamalia have suggested, there is a folk psychology in which each individual has a 'mind-as-container', which contains 'things' such as beliefs, intentions and motivations which determine behaviour. This carries with it the assumption of the child as an empty vessel and a very simple receptive, accrual view of knowledge.

To elaborate, in the behaviourist/empiricist view, learning is the process in which associations and skills are acquired and transfer occurs to the extent that behaviours learned in one situation are utilized in another. Motivation is seen as a state in the learner that favours formation of new associations and skills, primarily involving incentives for attending to relevant aspects of the situation and for responding appropriately. Behaviourism has been characterised in terms of observable connections between stimuli and responses and learning in terms of forming and strengthening or weakening and extinguishing these connections through reinforcement. More recently, connectionism is treating knowledge as the pattern of connections between neuron-like elements and learning as the strengthening or weakening of those connections. In fact, according to Bereiter and Scardamalia (1996) the notion that knowledge is in the connections constitutes a new metaphor of mind as pattern recognizer. The connectionist mind can, thus, be knowledgeable without containing knowledge (Bereiter 1991).

The cognitive/rationalist view emphasizes understanding of concepts and theories in different subject matter domains and general cognitive abilities, such as problem solving, and comprehending language. It is located by Greeno *et al* within the constructivist category because of its emphasis on organisation of information in cognitive structures and procedures, in other words, information-processing traditions. Learning is understood as a constructive process of conceptual growth, often involving the reorganization of concepts and growth of general cognitive abilities, such as problem solving and metacognitive processes. Ideas of motivation focus on ways of fostering the intrinsic interest of learners.

The situative/pragmatist-sociohistoric view sees knowledge as distributed among people and their environment, including objects, artefacts, tools, books and the communities of which they are a part. Analyses of activity are located within the context

of cultural practices and patterns of social interactions, as well as discourse and conversation analysis. Knowing is, thus, an attribute both of groups who carry out co-operative activities and individuals who participate in the communities of which they are members. In the view of the writers, there has been a continuity in the development of research in these three traditions over the twentieth century and each has been valuable in distinctive and complementary ways, providing resources for deployment in designing learning environments, analyses and formulation of curricula and assessment. Greeno et al (1996) conclude, moreover, that questions about theory are not limited to whether it is coherent and yields accurate predictions, but also whether it works, that is, whether the concepts and principles of the theory inform practice in productive ways.

Meanwhile, Prout and James (1990) and James et al (1998) have demonstrated that early childhood itself is a social and cultural construction. Cultures not only vary but change over time, thus, notions of childhood change correspondingly. These constructions are constituted through discourse and are highly productive of pedagogical theory and practice. Aubrey (2002), for instance, suggested that early childhood education (for three- to five-year-olds) in England, particularly in inner city contexts challenged to meet national targets for educational achievement, is the site for two competing discourses and ideologies. Early childhood is firmly on the agenda of improving educational standards in school through didactic means yet, at the same time, policy-makers and practitioners still adhere to the notion of a distinct pedagogy, practices and ways of understanding early childhood, as well as a distinct set of purposes for early childhood institutions. Moreover, Moss (1999) has concluded that different constructions of the child, early childhood institutions, learning and pedagogy, produce different constructions of the early childhood worker, such as, pedagogue, teacher, educator, nursery nurse or childcare assistant as well as what that work entails. Dahlberg et al (1999) contrasted the idea of early childhood workers as technicians, cultural transmitters and facilitators in age-appropriate activities with the notion of pedagogues and children as citizens and co-constructors of knowledge, identities and values, in a pedagogy informed by, but not determined by scientific knowledge and technical processes.

In short, social constructivist perspectives assume that there are no immutable understandings of childhood, purposes for early childhood services, theories, policies or pedagogical practices. The very embeddedness of early childhood education within particular social contexts renders the critical examination of dominant assumptions, discourse practices and cultural activities the more difficult for those sharing the same cultural 'lens'.

Different practices, discourses and meanings, moreover, demand correspondingly different approaches to research. Moss (2000: 6) argued that research in the field of early childhood educational services has been dominated too long by positivist research approaches, psychological and child development theory. Singer (1993), for example, described an 'attachment pedagogy' which attempts to model the dyadic mother-child relationship and is reflected in individualistic approaches to working with children, staffing structures and ratios, which undervalue the group of children, the 'pedagogy of relationships' and 'children as pedagogues'

This preliminary discussion is sufficient to indicate that even terms such as 'pedagogy' may, as Mortimore (1999) suggested, have changing connotations, which both open new possibilities and, at the same time, may be limited by the unexamined assumptions upon which they are based. Suffice it to say at this point that the educational practices to be examined in this section of the review have been located within the context of broader theoretical trends by the individual writers. These theoretical perspectives, we suggest, have contributed and continue to contribute important insights to our understanding of pedagogy.

RESEARCH QUESTION ON PEDAGOGY

Consideration of key definitions, key words and key theoretical perspectives led to the generation of broad research questions:

- how do children engage in learning experiences in preschool and early years settings and how can their learning be enhanced?
- what theoretical models (current/past) from research into cognitive and developmental psychology have the potential to inform early years pedagogy?
- how do adults support children's access to different forms of knowledge in different kinds of learning environments?
- what are the key features of appropriate learning environments for young children from birth compulsory school age and for pupils six- to eight-years-of-age in the first stage of formal schooling?

The review will start by examining the policy to practice context, in order to relate pedagogical events to the society in which they are located. Next, it will consider pedagogical processes in more detail by turning to the child's social context, developing a sense of self and becoming sociable. From here, it will turn to play in early years pedagogy and, finally, discuss relationships of learning and experience to cognitive neuroscience.

POLICY AND PEDAGOGICAL PRACTICE

From birth to compulsory school age

Early childhood is a crucial stage of life in terms of children's physical, intellectual, emotional and social development and of their well-being. A significantly high proportion of learning takes place from birth to age six. It is a time when children particularly need high quality care and learning experiences (QCA/DfEE 1999:4).

Since 1997, the government has increased investment in families and young children and attempted to create a wide-ranging programme to expand and reform early childhood education and care. It is beyond the scope of this review to do more than outline initiatives which relate to education policy. In May, 1998, a *National Childcare Strategy* was announced, to be implemented through locally-based *Early Years Development and Childcare Partnerships* working in conjunction with the local education and social services authorities. Separate funding for disadvantaged areas has been allocated through the *Sure Start* initiative. A pilot *Early Excellence Centre* programme was established in 1997 to test integrated approaches to care and education. In the year of 2000, *Curriculum Guidelines for the Foundation Stage* (for three to five years) were published by QCA/DFEE, to help practitioners to plan how their work contributes to the new early learning goals. All settings and schools receiving grant-funding for the education of these children are required to plan activities which help children progress by promoting personal, social and emotional development; communication, language and literacy; mathematical development; knowledge and understanding of the world; physical and creative development. The period from three years to the end of reception (at five to six years) is described as the foundation curriculum and the early learning goals set out what is expected for most children by the end of the foundation stage (QCA/DfEE 1999). Well-planned play, indoor and outdoors, is regarded as a key way in which young children with diverse needs, learn with enjoyment and challenge, including those children who need additional support or who have particular needs or disabilities. Such provision is monitored rigorously by the new Office for Standards in Education (OFSTED) team for early years settings. OFSTED has formulated national standards to ensure that all children receive good quality educational experiences and that providers are clear about the standards they must meet. Such initiatives are dramatically changing early years provision as well as the training needs of early childhood education and care workers. Local authorities are now required to provide an early education place (of two-and-a-half hours daily) for all four-year-olds and for all three- to four-year-olds by 2004, many of these new places are likely to be provided by playgroups, voluntary and private providers.

Over a similar period of time, since the DfEE-commissioned Hillage Report (Hillage et al 1998) *Excellence in Research in Schools* was published, the need for the actions and decisions of policymakers and practitioners to be informed by research has been widely recognised and supported by the *Action Plan* (DfEE, 1998). The First Report of the House of Commons Education and Employment Committee Committee *Early Years* was published in December, 2000. This report set out the evidence of an inquiry into early years education which examined:

- the appropriate content of early years education;
- the way in which it should be taught;
- the kind of staff that are needed to teach it and the qualifications they should have;
- the way quality of teaching learning in the early years is assessed; and
- the age formal schooling should start.

The broad age range with which the inquiry was concerned was three to six years, though account of the potential impact of the Government's Sure Start programme on early learning from birth to under four years, was also taken.

This report recommended that the years between birth and five plus should be viewed as the first phase of education, in which the involvement of families and parents will be crucial and that 'education and care are inseparable' (DfEE 2000: p. xii, paragraph 33). It was also recommended that children below compulsory school age should be taught informally in ways that are appropriate to their developmental stage and their interests. The DfEE document also stressed that more structured learning should be introduced very gradually so that by the end of the reception year children are learning through more formal, whole-class activities for a small proportion of the day.

The high level of commitment to evidence-based policy developments in the field of early childhood education and care has also been demonstrated in *The Effective Provision of Preschool Education (EPPE) Project* (1997-2003) sponsored by the DfES. This is a longitudinal study, which is investigating the attainment and development of 3,000 children between the ages of three to seven years, from 141 preschool centres, involving six English local authorities and including six main types of provision. Both qualitative and quantitative methods (including multilevel modelling) have been used to explore the effects of individual preschool centres on children's attainment and social/behavioural development at entry to school and at the end of Key Stage 1. Characteristics of more effective preschool settings, including interaction styles and pedagogy are particularly relevant to this section of the review.

By the Summer, 2001 quality of provision for early childhood education and care in the 25 reception classes in the regions, using two environmental rating scales, could be compared with previously-established scores for the main types of preschool provision (Sylva *et al* 2001). On a more global assessment of quality that included care components as well as activity ones, the nursery schools, classes and centres combining care and education showed evidence of higher quality than reception classes. Playgroups and private day nurseries lagged significantly behind local authority day nurseries. A more detailed

breakdown of factors showed reception classes were rated poorer than other local authority preschool settings for 'activities' as well as 'facilities' though for 'interaction' and 'supervision' they were similar to nursery schools, classes and combined centres. On a scale which provided a more detailed picture of curricular strengths, in literacy, reception classes were significantly better than day nurseries, private day nurseries and playgroups, and on a par with nursery schools, classes and combined centres. In mathematics, reception classes were stronger than all other sectors except combined centres. Science showed a different picture, with both nursery classes and schools excelling over reception classes. From this, it has been concluded that combined centres, nursery schools and classes seem to offer better education and care to young children than do reception classes.

In order to consider effective pedagogy in the early years in more detail, the DfES commissioned two further studies: one based on intensive case studies of identified effective practice from the EPPE project (Siraj-Blatchford and Sylva 2002) and one based on a study of identified effective practitioners (Moyles et al 2002). Results from the Siraj-Blatchford and Sylva (2002) study showed that the most effective settings provided both teacher-initiated group work and freely chosen yet potentially instructive play activities. Excellent settings tended to achieve an equal balance between adult-led and child-initiated interactions and activities. Cognitive outcomes related to teacher/adult planned and initiated, focused group work and the amount of shared thinking between adults and children with the curriculum approach supporting the *Curriculum Guidance for the Foundation Stage* and differentiated by age. Effective practitioners were seen to assess children's performance to ensure the provision of challenging, yet achievable experiences to model appropriate language, values and practices, as well as encourage socio-dramatic play, praise, encourage, ask questions and verbally interact with children. Findings from the Moyles et al (2002) study indicated that effective pedagogy was more than the application of knowledge and skills and a number of issues was raised. The most effective practitioners helped children to develop strategies for the identification and resolution of conflict. Play, however, was a high priority in thinking but not in practice. Formative diagnostic assessment was regarded as vital but rarely occurred. The value of the outdoor teaching and learning context was questioned. ICT provision varied considerably. Common to both effective pedagogy studies was the nesting of effective practice within a pedagogical framework, which included planning, resourcing and assessment, as well as professional management, development and self-evaluation, parental engagement, liaison with other professionals and community relations.

In contrast to these two process-oriented studies, the DfES also commission Taylor Nelson Sofres with Aubrey (2002) to investigate a number of challenges identified in implementing the Foundation Stage in reception classes with a telephone survey. A total of 1551 telephone interviews was conducted in October, 2001, among a representative sample of primary schools in England, 799 with head teachers and 752 with reception class teachers. Questions covered a number of areas: their general experience of and views about the Foundation Stage; implementation of the Foundation Stage; flexible implementation of the Literacy Hour and daily mathematics lesson; transition to Key Stage 1, mixed-age classes, parental involvement and relationships with their local EYDCP. Of relevance to this section of the review, were findings related to implementation and general experience of the Foundation Stage. Curriculum organisation tended to shift from a pattern of integrating the six areas of learning, at the beginning of the year, towards a greater differentiation by the end. This was accompanied by a similar shift towards the greater use of whole-class teaching and grouping of children by ability over the year, as recommended by the House of Commons Education and Employment Committee Report *Early Years* (2001). This was also consistent with the finding that the National Literacy and Numeracy Strategies were initially delivered flexibly across the day but, by the end of the year, the Literacy Hour and the daily maths lesson were in place. Class teachers felt able to provide opportunities for children to engage in activities they had planned and initiated themselves though, at the same time, they reported creative and physical development to be slightly, though significantly less important than literacy and numeracy. Moreover, whilst reception teachers felt the Foundation Stage had 'got it right' in terms of emphasis, 25 per cent thought that the Foundation Stage did not sufficiently address formal aspects of learning. This suggested that some teachers were still uncertain about the broader pedagogical approach being advocated, with play as a key way of learning.

Meanwhile, through initiatives such as Sure Start and Early Excellence Centres (EECs), new ways of supporting families and children before and from birth have been pioneered, particularly those who are disadvantaged. The pilot EEC programme has been subject to rigorous national evaluation, and already local evaluation is providing early evidence of the impact and cost-effectiveness of the programmes (Pascal et al 1999; Bertram and Pascal, 2000). This is an indication that a new range of research activities, used in appraising the design, implementation, and utility of social policy programmes in the early years, are also being used both at a national level by policy makers as well as by local evaluators.

Historically, English early years professionals (for birth to five-year-olds) tend to have diverse backgrounds, training and experiences and work in a variety of settings. Anning and Edwards (1999) examined how enquiring practitioners could develop preschool, cross-sector and cross-authority, learning networks through an 'educare' research partnership between local authorities, practitioners and university-based early years specialists. These networks not only sustained innovation during the project but led to the creation of several other sub-groups which formed and reformed within the authorities concerned. The action research model adopted, provided a focus for dialogues on analysis of observations, fieldnotes, photographs, video recordings, children's models and drawings and the conversations of parents and staff. As this moved forward a discourse was developed which bridged gaps between the lived experiences and working realities of individual professionals' lives as differing views of children and their needs provided a creative starting point and catalyst for meaningful exchange of ideas.

Engelstrom (1993: 67), writing within a sociocultural framework has described this sustained interaction across boundaries which seemed to result in learning as a problem space' 'at which an activity is directed'. Joint action around common interests, to which different perspectives and strengths were brought to bear, were central to this project.

Early childhood pedagogy research as described here varies from major, longitudinal effectiveness studies using multilevel modelling, through surveys that seek to investigate sources of facts, actions, views and perspectives of informants themselves, to evaluations and qualitative case studies of social phenomena in their natural settings as well as action research, which seek to solve professional problems in context.

Policy to pedagogical practice in the first stage of compulsory schooling
Policy to practice issues for children in formal schooling are inevitably different.
According to Ball (1999) the acquisition of skills and dispositions in current policy terms is stripped of social and psychological meaning. The pressures for performance, he argued, act back on pedagogy and the curriculum, both narrowing the classroom experience and encouraging teachers to attend to those students likely to 'make a difference' to the aggregate performance figures of the class and the school. Pedagogy and curriculum are shaped specifically to maximise test scores. This is in stark contrast to recent learning theory (of, for instance, Lave 1988 and Rogoff 1990) or, for that matter, the subject pedagogies of the original National Curriculum groups who, for instance in mathematics and science, emphasised investigations, open-ended problem-solving and real-world applications.

Most recent major primary educational research has not focused exclusively on Key Stage 1 (for five- to seven-year-olds). In fact, some primary researchers have not included this age range in their sample (for example, Galton et al, 1999). A common aim has been the documentation of changes to pedagogical practices which attended the introduction of a National Curriculum.

Alexander et al (1995) in the follow-up to an earlier study, considered the impact of the National Curriculum on professional educational practice in twenty-five schools and thirty teachers. Whilst larger-scale survey data confirmed considerable change in curriculum planning, management, assessment and record-keeping, analysis of discourse showed this taking place against a background of relative continuity at the deeper level of pedagogy. Teachers' pre-occupation with curriculum content and assessment seemed to have pushed pedagogy further into the background of their professional concerns than before 1988. 'Though the core dilemmas of primary teaching seem to be changing, primary pedagogy may not change substantially until it recovers its central position within teachers' dilemma consciousness' (1995: 117). Alexander et al concluded that recent pedagogic research tended not to follow through its analysis of pupil outcomes, and drew attention to the fact that we needed to know more about the relationship between subject structures, teachers' conceptual grasp of subject matter, and the character and content of teacher-pupil interactions. Evidence of powerful continuities in teacher-pupil discourse supported the view that the National Curriculum has been a weaker influence than factors specific to the teacher, the classroom and the professional culture.

Alexander (1999) also reported on a primary education project in five cultures which aimed to build on his previous classroom enquiry methods, lines of pedagogic analysis and experience of interpreting pedagogy in the comparative dimension. Data were gathered at two levels: at school level, observation, document analysis and journals, involving pupils at the mid-point of our Key Stage 1 and Key Stage 2; at local and national level, involving interviews with policy-makers and officials. Comparative research provided the opportunity to interrogate a number of assumptions upon which the current drive for standards is based.

Suffice it to say that none of these assumptions were supported by the analysis. The writer noted that, by 1998, direct intervention in pedagogy with minute-by-minute prescriptions of the literacy and numeracy hours had imposed a 'single pedagogical formula' on 'every primary school, classroom, teacher and child in England' (Alexander et al 1999: 176) and that 'international research has now been enlisted by policy-makers and their advisers to support rather than challenge' … 'a nineteenth-century, proto-industrial primary curriculum' (ibid 1999: 172) 'long since identified as having survived as a result of the complexity of the contemporary web of policy and culture within which classrooms are embedded' (ibid 1999: 150).

Brown et al (2000: 457) examined the policy process between 1997 and 1999 in relation to the production and implementation of the National Numeracy Strategy. They also described a tension between ideologies of traditionalism and apparent modernisation, represented among those responsible for the education policies and reflected in the Numeracy Strategy text production. Furthermore, in the context of practice, despite the high levels of top-down prescription, uniformity of training and control, 'cyclical recontextualisations and multiple interpretations' existed, some of which arising from inconsistencies and ambiguities in the policy texts themselves. Whilst broadly welcoming improvements in areas such as mental calculation they suggested that, in the long term, the curriculum shift may be shown to have gone too far, and necessitate a counter-movement towards the synthesis and meaning needed for creative application, problem-solving and investigation.

Pollard *et al* (1994) also investigated the impact of the English National Curriculum in terms of curriculum, pedagogy and assessment. They, too, came to see the changing focus of education policy as a reflection of the tensions between modern and post-modern society, with new priorities and new forms of contestation, regulation and discourse emerging. Their early data suggested that classroom life reflected a more classified, subject-based curriculum, increasingly controlled and framed forms of pedagogy, and more explicit forms of assessment. It was argued subsequently, in Croll (1996: 156), that schools, teachers

and pupils were 'embedded in a dynamic network of personal identity, values and understandings developed in the light of internal and external interaction, pressure and constraint'. Policy directives were translated into classroom practice through a series of 'mediations', or creative reinterpretations by the actors involved at each successive stage of the process of delivering education. Bernstein's (1996) theoretical model of curriculum classification and pedagogical framing provided a powerful tool with which to examine the documented changes in the PACE data (Pollard et al 2000).

According to Ball (1999), both the present and previous governments have emphasised education's role in contributing to economic competitiveness whilst, at the same time, generating a system based on decontextualised, 'basic skills' learning in which a didactic pedagogy and a prescribed curriculum are shaped to maximise test scores. He has described the orientation of policy analysis as 'critical and deconstructive'. The task of policy analysis is, thus, post-structural analysis of discourse and texts to 'interrupt the taken-for-granted' and isolate 'contingent power relations which make it possible for particular assertions to operate as absolute truths' and 'critical ethnography' in which process and case analyses generate critical perspectives on the impact of policy in local settings. Other educational researchers reporting on policy to practice matters in the formal school years in this review, however, have used a conventional range of quantitative methods, for example, structured interviews, systematic classroom observation and attainment testing; and qualitative case studies using observation, interviews, questionnaires, journals and document analysis.

Although, in respect of school-age children, Alexander et al (1995:17) considered that 'for the foreseeable future the policy-practice interface in education will remain problematic and elusive … and policy-led change … off-set, balanced or indeed subverted by apparently fundamental continuities', early years researchers have been attempting to improve this situation (see for example Dahlberg et al 1999; Moss 2001; Lubeck and Jessup 2001).

DEVELOPING A SENSE OF SELF AND BECOMING SOCIABLE

Consideration of the child as a citizen and co-constructor of knowledge with other children and adults demands more specific attention to young children in a social context. This part of the review examines studies that share insights on the young child's developing capacity as a social being. As Schaffer (1999) pointed out, whilst the development of the young child's ability to understand and so relate to others shows parallels with self-development and self-awareness, the links between these parallel developments remain uncertain. We know that young children are forming social concepts during these early years of development, about themselves and about the people with whom they interact. They are striving to make sense of their experiences in interpersonal situations but the processes involved in making sense and the contexts most conducive to making sense are relatively un-researched. Familiarity with contexts and similarly engaged players seems to play some part as repetition and rehearsal enable the conceptual frameworks to become assimilated. As infancy recedes, young children are striving for self-control and wider control of an increasingly familiar environment that they must share with others. This first part of the review on developing a sense of self and becoming sociable offers a backdrop for a subsequent review of some British-based studies of the last ten years or so. The review focuses mainly on the two to eight age range, going briefly, slightly beyond and into the primary sector for further illumination.

Vygotskyan and Piagetian legacies remain influential in a developing understanding of the growth of sociability. Vygotsky (1978; 1988) emphasised the social orientation of cognitive development, collaboration becoming a route to assimilation and independent action by re-structuring and re-patterning internal cognition. He drew attention to inherent links between emerging sociability and intellectual growth through the medium of language. Building on his work, other writers have emphasised the need to better understand how socio-cultural contexts shape behaviour and development (Hennessy, 1993; Suchman 1987; Mercer 1992; Rogoff 1990; 1994). Piaget's work on schematic building has been a focus for Athey (1990) and Nutbrown (1999) each of whom illustrate the emergence and consolidation of schematic understandings in young children, often in the company of similarly engaged peers. These learning communities can be vigorous, innovative and dynamic but what do we really know of them?

Broadhead (1997; 2001) in observational studies of three- to five-year-olds in nursery and reception class settings has begun to chart the progression from associative to cooperative play through four levels of development. This chart (or continuum) describes the characteristics of interactive play as language and action. It demonstrates increasing reciprocity and complexity in both as children progress to cooperative play. It illustrates high levels of intellectual demand and creativity as children sustain cooperative endeavour, a key feature of which is joint problem-solving in a variety of guises. Its use with practitioners is illustrating some potential for enhancing their professional understanding of the links between children's social and cooperative play and intellectual challenge and problem-solving. Ogden (2000) drew on *theory of mind* perspectives in her study of peer reciprocity in reception, year 1 and year 2 classrooms. This research revealed how, as children become older, levels of mutual understanding are enhanced. Children begin to perceive peers as intentional agents and recognise and anticipate intentional action. They learn to plan as they play and in so doing, to accommodate the needs and intentions of others in order to ensure the play is sustained.

Munn and Schaffer (1993) identified a growing appreciation of how the development of literacy and numeracy are related to social settings and these form the contexts for children's early cognitive achievements. They observed two- and three-year-olds in day nursery settings and interviewed staff. Literacy events were greater in number than numeracy events. Whilst these

environments were full of opportunities for literacy and numeracy events, one key issue is how effectively adults can communicate their potential to the children in naturalistic ways that correspond with children's immediate and spontaneously articulated interests. The adult is a key figure in supporting young children's emerging sociable and cooperative potential and in linking that potential with cognitive growth through the provision of an appropriate learning environment and through their own interventions with interacting peers.

Mercer (1996) has identified communicative and intellectual dimensions relating to the organisation of collaborative activities for five- to twelve-year-olds. Talk is illustrated as a social mode of thinking and not just a means of communication, further evidence that cooperation is linked with intellectual stimulation and development. The study encouraged a reconsideration of the status of peer talk in educational settings and also highlights the need for a rationale of procedures and principles for related activities – a rationale explicit to learners as well as teachers. Yet again, we note that it is the degree of adult understanding about interactive learning opportunities that is a key feature here. The EPPE project provides additional insights. This, as noted earlier, is a large-scale, longitudinal study of factors affecting the effectiveness of a range of types of preschool provision. Social/behavioural development was measured using the Adaptive Social Behaviour Inventory (Hogan et al\ 1992). One finding (Melhuish et al 2001) showed that where English was a second language, this was associated with lower cooperation/conformity ratings and lower cognitive development scores. Ratings were provided by educators in the provision. Children of professional parents were rated more highly on social/behavioural variables. Girls showed more cooperation/conformity, peer sociability and confidence and also had higher cognitive development scores.

Hurd (1990) drew on Edwards and Mercer (1988) to distinguish ritualistic knowledge from principled knowledge – the latter being grounded in deep conceptual understanding and the former on an absorption of common usage rather than full understanding. Hurd's work gives insights into the adult's role (scaffolding), as does Mercer's (1996), and Edwards and Mercer (1988) in assisting the child in developing principled understanding. She further shows how some children's relative lack of principled understanding might be masked by seemingly advanced or age-appropriate social skills. There is clearly a role for the adult.

Some studies (Bennett and Dunne 1992; Galton and Williamson 1992) have revealed that collaboration is often not sustained in primary classrooms. Others have revealed that the potential is there if the environment is conducive and if educators are familiar with the purposes and benefits and see the associated activity as high status.

In understanding the growth of sociability and the development of cooperation, we need now to draw closer parallels between psychologically-informed approaches linked to child development and opportunities available in early education settings. This would suggest a need for observation-based studies in settings along with informed insights pertaining to a range of types of interventions or 'scaffolding' in enabling children to initiate and sustain sociable and cooperative encounters and to develop related knowledge and understanding in literacy, numeracy and other areas of learning. These types of interventions might be direct, such as adults playing and working alongside children, adults structuring play to achieve particular goals and adult design of tasks. They might be indirect such as allowing sufficient time for play themes to develop and providing open-ended resources that stimulate innovative responses from young learners much as the Reggio Emilio approach in Italy aims to do. (For information on the Reggio Emilia approach, see Abbott and Nutbrown 2001; Edwards et al 1998).

New studies of sociability, such as those suggested above, might benefit from a focus on creativity and how it is understood, described and valued in settings for young children. We know little about this dimension yet it seems integral when considering how the intellectual demands of cooperative endeavour are shaped and sustained and links too with schematic development.

Some progress has been made in understanding how children begin to perceive the necessary detail to build effective schemas whilst initiating and sustaining sociable and cooperative encounters. We need further understanding of these complex processes.

RESEARCH ON PLAY

Among the fundamental continuities in early years pedagogy has been well planned play, indoors and outdoor, 'as a key way in which young children learn' (QCA 1999:10). Play is an almost hallowed concept for teachers of young children. It is richly cloaked in ideology which emphasizes its fundamental role in early learning and development (King, 1978). Among the tenets of this ideology is the idea that children need to play, and in doing so, reveal their ongoing needs which, ideally, should inform the curriculum offered. Various forms of play have been elevated to the dominant and most natural ways in which children learn. A direct relationship between playing and learning is assumed, such that learning occurs spontaneously without the necessity for adult presence (Bruce 1987; Anning 1997; Bennett et al 1997). In spite of these endorsements, a consistent picture that emerges from research is that play in practice is problematic. In 1977, Manning and Sharp reported on a project, carried out under the auspices of the Schools Council, entitled *Structuring Play in the Infant School*. The introduction to their study set an agenda which remains relevant some 25 years later:

The idea of the project first arose because of the difficulties which many teachers were experiencing in using play in the classroom. Although accepting that children learn and develop through play and that play is a motivating force for children's learning, many teachers are pressurized by the very full first school curriculum and large classes to neglect play as a means of teaching. They leave children to play on their own. In addition, any parents' expectations are that children will 'work' when they come to school, not 'play'. (Manning and Sharp 1977: 7)

What progress has been made in terms of theory, research and pedagogy in validating play as a medium for learning and teaching? Theoretically, there are substantial claims for the value and significance of play in language and literacy learning; emotional development; social competence and peer group affiliation; spatial and mathematical learning; and the development of positive learning dispositions and orientations. Much of this research has emanated from the disciplines of biology, psychology and anthropology. In the last 30 years, there has been a significant change from generating broad understanding about the role of play in early development, to more specific understanding of its relationship to learning, particularly in educational settings (Pellegrini and Boyd 1993). In terms of exploring the pedagogy of play, Guha (1988) made a useful distinction between play *as such,* and play *in school*, and argued that play *in school* is likely to be qualitatively different. The emphasis in research has changed from 'What is play, and why does play occur?' to 'What does play do for the child?' and, 'How can good quality play contribute to children's educational progress and achievement?'

Pedagogically, claims about the efficacy of play have been linked to the progressive, 'child-centred' approach that was based on the work of Dewey and others, and gained currency during the latter half of the twentieth century. The ideals of progressivism were consistent with the 'play ethos' (Smith, 1988), and included a joint emphasis on exploration, discovery, hands-on experience, child-initiated activity, and the importance of choice, independence, and control. Whilst play forms the bedrock of early learning, an agreed pedagogy of play is less well articulated, and play in practice is deeply problematic. The dominant ideology is not underpinned by systematic empirical research, and key studies both in preschool and statutory school settings have identified significant gaps between the rhetoric and the reality of practice. With the ascendancy of the New Right in the educational arena, the ideologies that validated progressivism and play were devalued (Anning and Edwards 1999). The educational agendas of successive Conservative governments from 1979 onwards prioritised increasing control of what should be taught in schools, and how that teaching should be carried out. Thus the role and value of play were not just questioned, but on the basis of research evidence from the 1980s onwards, were questionable.

Several key studies have provided an evidence base on the quality of play, its educational benefits, and the pedagogy of play, in the contexts of preschool and school settings (Tizard et al 1975; Sylva et al 1980; Wood et al 1980; Meadows and Cashdan 1988; Hutt et al 1989; Bennett and Kell 1989; Cleave and Brown 1991; Bennett et al 1997). Most of these studies did not focus specifically on play, but on broader curriculum and pedagogical processes, of which play was an integral part. Their findings were critical of the quality of play; the dislocation between the rhetoric and reality of play; the extent to which play and learning were linked; the role of adults in children's play, and how play was utilised towards educational outcomes. The consistent picture to emerge from these studies is that play in practice has been limited in frequency, duration and quality, with teachers and other adults too often adopting a reactive, 'watching and waiting' approach. The following sections provide a brief review of the key studies and their findings, focusing firstly on play in preschool settings, and secondly, on play in Reception classes.

Play in preschool settings

The Oxford Preschool Research Project focused on adult-child talk and interactions, and detailed observations based on the 'target child' method. Sylva et al (1980) aimed to assess the extent to which different learning contexts in preschool settings stimulated complex activity, concentration, and interactions between children, and between children and staff. Certain contexts elicited more complex play, longer periods of concentration, and more extended dialogue. Play activities that were classified as 'higher level' in terms of task demand included more structured activities such as art, and large and small-scale construction, paired play, and play with adults, particularly for older children. In a related study, Wood et al (1980) were also critical of the role of adults in children's play. They concluded that adult involvement in play was rare, and that adults either did not regard playing as part of their job, or as only a small part of their job. A consensus in both studies was that the adults had a commitment to allowing free play because children were better able to select the direction of play for themselves. Adult intervention was considered to be potentially damaging to the spontaneity and imagination of children. A further consensus was the powerful influence of the social context in relation to social participation in play, and the level of cognitive challenge. Both studies detail the methodological challenges of studying children in naturalistic settings that are complex and dynamic. They also highlight the issue of the researchers' ability to interpret the meanings and actions of adults and children.

The theme of adult interaction in children's play was reiterated in subsequent studies. Meadows and Cashdan (1988) reported a study that aimed to characterise the range and variation of teaching styles in a sample of typical mainstream nursery schools over a period of four school terms. They used similar observation and interview methods to the Oxford preschool project and looked at children in different contexts during the sessions. Analyses of the quality of 2809 bouts of play resulted in some critical findings. There were differences in the duration and quality of play according to the age and maturity of the children. Levels of involvement and participation were higher for older children; the duration of play bouts was longer, and sequences of play were more complex. There was also considerable variation between children in their free play behaviour and in the cognitive content of their play. The study noted a lack of intellectual challenge, and provided evidence of repetitive activity that indicated boredom, or disengagement. The authors concluded that there was only weak evidence that the traditional free

play curriculum contributed to the development of children's thinking or to their later educational achievement, though it contributed more clearly to the development of their social skills. They also commented that the missing ingredient in free play was 'responsive, scaffolding participation', which constituted a further challenge to the efficacy of play as a child-centred, child-led activity.

Further critical evidence regarding adult interaction and the quality of play in preschool settings was provided by Hutt et al (1989) Their study noted that children engaged in stereotypical, repetitive behaviours, particularly in sand and water play, and there was little evidence of cognitive challenge. Adult interventions were predominantly monitorial and did not involve sustained conversations. The activities where an adult was present (commonly collage and junk modelling) produced more sustained engagement and lively discussions. Fantasy play was quite rare, and occurred primarily among children in positive affective states. In common with the study by Sylva et al (1980), quite a high proportion of children's time was spent in 'transit activities' such as on-looking and walking around.

A consistent theme running through these studies was that educators need to create the conditions for learning through play. This theme was reiterated in the study carried out by the Froebel Block Play Research Group (Gura, 1992) This study focused on detailed observations of children's play with blocks over a three-year period, and provided a more detailed specification of teaching and learning through play, and of the importance of adult interaction. Much of the children's learning was distinctly scientific, technological and mathematical. They also needed to acquire 'play knowledge' about the blocks in order to develop mastery and use them for a variety of functions. With experience, the children used the blocks in increasingly complex ways, showing progression in their knowledge and skills. The study concluded that a number of learning-relevant conditions were necessary to support high quality play, including:

- adult involvement
- allowing children to share the initiative about what is to be learnt
- enabling children to take risks, be creative and playful in their ideas
- organising the physical setting to maximise learning opportunities
- developing effective systems for observation and record keeping, and using these to inform curriculum planning.

The study provided further validation of a proactive and interactive role for practitioners, which was more in tune with the socio-cultural theories of Vygotsky than with the traditional laissez-faire ideologies of play.

Findings from these studies indicate some problematic issues surrounding play in preschool settings. First, there is little understanding of how play progresses in early childhood, and how progression can be supported. Second, practitioners tend to espouse an ideological adherence to the efficacy of free play, even though there is little empirical evidence to support this. Third, practitioners make assumptions about the competence and ability of young learners to benefit from a predominantly laissez-faire environment, in which they are expected to choose from a wide range of activities and experiences. Fourth, not all young children know how to play, and the role of educators is critical in supporting their abilities to benefit from play. The evidence for social and cognitive gains, and for educational effectiveness of 'the play way' is, therefore, limited.

With the expansion of preschool provision from the mid-1980s onwards, the focus of research shifted from preschool settings to reception classes in primary schools. In terms of progression, research evidence from the U.S.A. indicates that children's play skills and preferences are correlated with developmental progressions in social, cognitive and psycho-motor competence (Kelly-Byrne 1989; Hughes 1991; Sutton-Smith 1997). Hughes (1991) argued that children's play development moves along paths of increasing complexity, and their thinking becomes more orderly, structured and logical. Sutton-Smith (1997) takes a similar standpoint and states that although play is seldom the only determinant of any of the important forms of learning that occur in children, play in childhood is nevertheless progressive, and may facilitate transfer of knowledge and skills between different contexts. In contrast, empirical evidence indicates variable quality in play provision for four and five year old children in school settings, and a lack of progression in their play skills (Bennett et al 1997; Wood and Bennett, 2000).

Play in Reception Classes

A number of research studies have raised concerns about the quality of educational experiences offered to four- to five-year-old children in reception classes. The age at which children enter reception has fallen gradually from 'rising five' to 'just four', and although a play-based, nursery style curriculum has always been advocated for this age group, there is limited evidence of this in practice. Sestini's study (1987) showed that although play activities were provided, teacher attention was focused predominantly on more formal tasks, particularly literacy and numeracy. Play served a mainly social function, and there was little evidence of cognitive challenge. Similar conclusions were reached by Stevenson (1987), Bennett and Kell (1989) and Cleave and Brown (1991). Again, the teachers in these studies espoused a commitment to the value of play and expressed clear views about its potential purposes and benefits in relation to children's learning. However, Bennett and Kell's study found play to be 'very limited and very limiting'. Play was mainly used as a time filler; teachers generally had low expectations of it; there was no clear purpose or challenge; pupil involvement was lacking, and there was little monitoring by teachers, or attempts at extension and challenge.

Bennett et al (1997) provided more detailed insights into why learning through play is problematic, and why there is a gap between rhetoric and reality. They carried out a study of nine reception class teachers' theories of play and their relationship to classroom practice. The study demonstrated that although the teachers were all committed to integrating play into the curriculum, the intended learning outcomes were not always achieved. A number of constraints were identified that intervened between teachers' theories and practice, including the legislated curriculum framework; parents' expectations; the school timetable; space and resources; adult:child ratios, and the children's abilities to profit consistently from play-based activities. Progression in learning through play was difficult to sustain because precise learning outcomes could not always be achieved or measured. The teachers found it difficult to interact with children in order to support learning, and increase their own knowledge of the value of play/learning contexts. This study has added substantially to understanding the pedagogy of play, and the practical constraints faced by reception teachers in achieving continuity with the preschool curriculum. In common with the studies of preschool settings, one of the key findings of this study was that teachers need to take a more proactive and interactive role in supporting children's learning through play.

In addition to these 'broad-brush' studies, more detailed studies have been carried out which illuminated specific aspects of learning and development. Hall and Robinson (1995) reported a curriculum project that explored the relationship between children's socio-dramatic play and the development of writing. They concluded that there were a number of conditions for learning literacy, including the provision of authentic activities and stimulating contexts, maintaining links between oracy, reading and writing, structuring the learning environment to provide appropriate resources, materials and literacy 'events', and educative, responsive interactions between teachers and children. They warned against the danger of narrowing teaching to focus mainly on literacy skills and instructional strategies, and the possibility of losing sight of the complexity of events for which these skills are required. This warning seems particularly apt in view of the subsequent introduction of the prescriptive National Literacy and Numeracy Strategies which are having a marked influence on pedagogy in the early years (Wood and Bennett 2000).

In summary, research evidence for the efficacy of play is mixed and, in some areas, problematic. This view has also been reinforced by evidence from OFSTED inspection reports (OFSTED 1993). Whilst play-based learning appears to hold much promise, implementing a play-based pedagogy continues to present numerous challenges to practitioners. The original impetus for Manning and Sharp's study still has currency over a quarter of a century later. However, the recent *Curriculum Guidance for the Foundation Stage* (QCA/DfEE 2000) builds substantially on previous government reports (DES 1989; DES 1991) and provides a strong validation for play and talk in the curriculum. So what characterises this new pedagogy of play? The primary emphasis is that play should be planned and purposeful, and should provide children with challenging and worthwhile activities. In addition to creating the appropriate conditions for learning, practitioners are encouraged to interact with children and provide a richly resourced learning environment. Children should be enabled to plan and develop their own activities, and have sustained periods of time to work in depth.

This dual approach (teacher-directed and child-initiated play) potentially holds considerable promise for practitioners to develop a greater degree of synchronicity between playing, learning and teaching, as recommended by Bennett et al (1997). At the same time, this duality raises the questions of whose purposes are being served – those of the curriculum, or those of the children; and to what extent are those purposes competing or complementary? The primary assumption is that teachers take the lead in determining what constitutes planned and purposeful play. However, evidence from preschool programmes in other countries (Siraj-Blatchford 1999) indicates that children are equally capable of developing planned and purposeful play. The work of Athey (1990) and Nutbrown (1999) has also shown how educators can base curriculum planning on children's own learning agendas. Their work was based theoretically on Piaget's ideas about young children's schemas (patterns of learning and thinking), and has shown the importance of representation, symbolisation and playfulness in the development of literacy, mathematics, science and technology.

There are already emerging concerns about competing policy directives, and the influence of the more prescriptive National Literacy and Numeracy strategies on provision for children under five. Anning and Edwards (1999) raised concerns about early childhood pedagogy becoming content driven and focused on instructional strategies. Such directives would militate against the constructive use of play, and could well sustain a more formal pedagogy. Wood and Bennett's recent study of progression and continuity in Nursery, Reception and Year 1 classes provided evidence of a transition from predominantly learner-centred approaches in nursery, towards curriculum-centred approaches in Reception and Year 1. Their study noted regression in play and little continuity, because of the increased pacing and sequencing of curriculum content, and the pressures from the Literacy and Numeracy Strategies (Wood and Bennett 2000). In relation to the current discourse of standards, effectiveness, intended learning outcomes, and performativity, learning through play remains vulnerable because it is not always predictable, and is likely to lead children and practitioners in unplanned directions.

Clearly there is a need for further research into play and its relationship to learning in order to underpin a more secure pedagogy of play. In conclusion, there is much valuable research on play emanating from the U.S.A. and Pacific Rim countries. Some of the studies are small-scale, and many focus on children with special educational needs. However, there is a substantial body of international evidence that supports the role and value of many different types of play to children's all-round learning and development (Sutton-Smith 1997; Roskos and Christie 2000). There has been notable progress in understanding children's early literacy and numeracy development, in examining the effects of socio-dramatic play on children's social and cognitive competence, and on establishing relationships between children's play styles and learning

styles. Theoretically, there is less adherence to a Piagetian model of 'ages and stages', with a gradual shift towards locating research in socio-cultural frameworks. Socio-cultural theory may provide a means for understanding the nature of progressive learning through play in different settings, and the relationships between learning in play-based and formal learning contexts. Such contextually situated accounts would also contribute to greater synergy and joined-up thinking between psychologcially-based studies of play, ideological claims for its efficacy and play in educational practice.

Emerging evidence on the neuro-physiological development of the brain also indicates the potential importance of children making connections between areas of learning and experience through exploration and experimentation, as well as through collaborative and reciprocal relationships (Greenfield 2000; Gopnik et al 1999). A challenge for the early childhood research community is to develop further research on play which is theoretically and methodologically rigorous, provides sound guidance for practitioners and policy makers and contributes towards a new pedagogy of play.

BRAIN DEVELOPMENT RESEARCH

The significance of research on brain development for early years education

The last decade has seen a huge explosion of research on the brain and there has been much debate recently as to whether neuroscience can usefully inform educational psychology and understandings about pedagogy in the early years. It seems self-evident that, as the brain is the main centre of learning, understanding about its functioning must necessarily inform pedagogy. Some commentators have suggested, however, that to endeavour to make links between cognitive neuroscience and education is a 'bridge too far' (Bruer 1997). There is certainly an array of deductive pitfalls which need to be avoided in interpreting neurophysiological research, including various kinds of reductionism, over-interpretation and over-simplification.

Notwithstanding the complexities of the relationships between brain physiology, cognition and learning, several commentators have already begun to make claims about implications for early years education (see, for example, Brierley 1994; Shaw and Hawes 1998; Sylwester 1995). While some of this work may easily be dismissed as over-simplification, there is a growing body of research evidence which does lend support to some general conclusions. There are also increasing indications of the ways in which further research may be capable of throwing light on significant questions in early education – for example, those related to issues concerned with young children's relationships and the significance of the emotions during early learning and brain growth. The question arises as to whether neuroscience usefully informs educational psychology and understandings about pedagogy in the early years.

Next, it is necessary to consider whether there are specific issues in early years education which, might be informed by research in cognitive neuroscience. In a special edition of *Educational Psychologist* (1992) devoted to the brain and education, research papers by a range of well-respected cognitive neuroscientists and psychologists reviewed neurophysiological research relevant to issues such as reading and writing acquisition, metacontrol, explicit memory and generative learning processes. Bransford et al (2000) have more recently edited a review put together by the prestigious Committee on Developments in the Science of Learning, which comprised sixteen leading researchers in cognitive science across the United States. They concluded that there was an exciting convergence of evidence about human learning from a number of scientific fields, including developmental psychology, cognitive psychology and neuroscience. Key conclusions from this evidence included:

- learning changes the physical structure of the brain;
- structural changes alter the functional organisation of the brain, in other words, learning organises and re-organises the brain; and
- different parts of the brain may be ready to learn at different times.

They reviewed evidence about a wide range of aspects of learning to which brain studies have contributed, including memory, problem-solving and reasoning, early predispositions, metacognitive processes and self-regulatory capabilities, cultural experience, expert performance, transfer of learning, learning environments and effective teaching.

A key issue in relation to the teaching of young children which evidence from neuroscience has been used to address is the special significance of early learning and critical periods for learning. It has been argued that the significance of the early environment may be associated with the period of rapid synaptic proliferation, termed *synaptogenesis*, in the first few months of life and the subsequent period of synaptic elimination or pruning during which frequently used connections are strengthened and infrequently used connections are eliminated. Different areas of the brain go through these processes and stages at different rates. For example, synaptogenesis occurs later and the pruning process takes longer in the area of the frontal cortex responsible for planning, integrating information and decision-making than they do in the visual cortex. In a number of areas, periods of growth in synaptic connections have been shown to be associated with related cognitive gains (Byrnes and Fox 1998).

As Blakemore (2000) concluded, a considerable body of neurobiological evidence supports the importance of enriched, stimulating early childhood environments. A Canadian psychologist, Diamond, has been researching in this area since the 1960's and has identified a range of features of work with young children that influence the brain's growth and development (Diamond and Hopson 1998). These included positive emotional support, stimulation of all the senses, the presentation of novel challenges, encouraging social interaction and an active style of learning. Rich experiences in particular areas of learning are also associated with growth in associated brain regions, for example, a language rich early environment has been shown to be associated with dendritic growth in the left hemisphere's language centres.

On the contrary side, impoverished or stressful early environments can be damaging to brain development. Glaser (2000) provided evidence of impaired development of the hippocampus in children suffering child abuse and has argued that secure early attachments have demonstrable positive effects on brain development.

A number of reviewers and commentators have pointed out, however (Bruer 1997; Blakemore and Frith 2000), that this evidence of early synaptenogenesis and differential growth between brain regions cannot be used to argue that early childhood constitutes, in some sense, a *critical period* for learning. Indeed, the evidence of the impressive plasticity of the adult brain (see McGuire et al 1997, for example, on London taxi drivers) and on its ability to recover from early deprivation, led Blakemore and Frith to conclude that:

> there is no biological necessity to rush and put the start of teaching earlier and earlier. Rather, late starts might be reconsidered as perfectly in time with findings from brain research.
>
> (Blakemore and Frith 2000: 2)

From their impressive review of work in neuroscience relevant to educational concerns, Blakemore and Frith (2000) also highlighted evidence about the power of implicit learning. From a range of work it has been long established that a considerable proportion of learning, by children and adults, takes place without awareness (for a review, see Gardner 1996). Berns et al (1997) have successfully investigated and mapped the regions of the brain of subjects involved in responding to novelty (the ventral striatum) and contextual information (the right prefrontal cortical area) while learning complex sequences in stimuli, completely without any explicit awareness.

This work raises important pedagogical questions about the efficacy and timing of explicit instruction as opposed to more experiential approaches to learning. A whole set of unexplored questions remain about the contribution which can be made to young children's learning by adult intervention and various kinds of modelling, explicit knowledge transfer and so on.

Whether neuroscientific research will be able to help further with a range of unresolved but important questions in early education is still a matter of conjecture and debate. Some questions which might be amenable to this kind of work include:

- can we be more specific about developmentally appropriate kinds of experiences at different stages/ages?
- what is the precise nature of individual differences at birth (for example, between boys and girls), and what 'abilities' are most susceptible to the influence of experience and learning?
- how and why do certain kinds of experience enhance learning (for example, play)?
- how can the introduction of explicit declarative knowledge support implicit learning in young children?

Bruer (1997) has concluded that if we are looking for a basic science to help guide educational practice and policy, cognitive psychology is a much better bet. It is also fundamental to our everyday understanding of the way neural structures support and implement cognitive functions. In the meantime, we should be sceptical about brain-based educational research policy and practice but look more carefully at what behavioural science already can tell us about teaching, learning and cognitive development.

The relevance of brain research for early childhood education: conclusions

The policy to practice context in relation to early years pedagogy is one which is receiving considerable, current attention. The recent Education and Employment Select Committee Report *Early Years*, for example, took evidence from experts and visited different nursery settings in England and abroad. Their report concluded that children should not be introduced to formal learning too early. So how *do* children engage in learning experiences in preschool and early years settings and how can their learning be enhanced? Evidence from brain research is consistent with psychological research and leads to certain conclusions:

- experience –everything that goes on around the infant and young child – changes the brain;
- everything the baby and young child sees, hears, touches and smells, influences the developing network of connections among brain cells (neurons);
- other people play a critical role;
- babies and young children have powerful learning capacities;
- they actually participate in building their own brain;
- radically deprived environments may influence development.

So *do* theoretical models (current or past) from research into cognitive and development psychology have the potential to inform early years pedagogy? Where does the latest brain research leave twentieth century theory which educational researchers have invoked as the philosophical and conceptual base to their empirical investigations? Even though the theories of twentieth century pioneer developmental psychologists such as Piaget and Vygotsky were rooted in detailed and pain-staking observation, the last twenty to thirty years have been marked by the use of video recording and computers which have exploited what babies do even at the preverbal stage to transform our knowledge about the earliest stages of development. Right from the start, it seems, babies are thinking, observing and reasoning, building models which are then refined in the light of subsequent experience.

How do adults support children's access to different forms of knowledge in different kinds of learning environment? Post-modern critical thinking has revealed that such apparently technical terms as 'pedagogy' far from being universal and value-free reflect a diversity of perspectives and interpretations which must be exposed before alternative practices can be investigated. Perhaps the only question which is left is – what works?

The evidence we have suggests that the most effective preschool settings plan a curriculum which is taught informally, in ways appropriate to the child's age and interests. Parents and families are involved. A balance is struck between teacher-initiated group work and freely chosen yet potentially instructive, child-initiated play activities which can stimulate co-operation and reciprocity. Effective practitioners assess children's performance to ensure the provision of challenge, at the same time, modelling appropriate language, values

and practices, encouraging socio-dramatic play, praising, interacting and questioning. Cognitive outcomes appear to be associated with adult-planned and initiated group work and shared thinking in the context of integrated areas of learning. By the age of six years, however, it seems that a shift is made from a play pedagogy towards a greater differentiation by subject area, a greater use of whole-class teaching and the grouping of children by ability. In general, conclusions drawn from the evidence indicate that pedagogical practices in the first stage of compulsory schooling have been too driven by pressures for performance since the introduction of the National Curriculum and attendant assessment. In the context of some powerful continuities, there is a consensus that whilst broadly welcoming improvements in some areas, the curriculum shift may be shown to have gone too far in terms of the prescription of a single pedagogical formula in particular for literacy and numeracy.

Importantly, there is a growing recognition of the need for researchers, policy-makers and practitioners to work together as partners to define problems and forms of enquiry which are helpful to all groups. Donovan et al (1999), in the United States, propose that research on human learning should provide a dynamic mechanism for advances in learning and teaching into continual cycles of co-ordination and improvement. We would also argue that the strong evidence from neuroscience has a welcome place in any reviews of evidence about young children's development and learning, but its main role is that of supporting existing arguments in the field of ECEC, which have been based on research in this field.

III. CURRICULUM AND ASSESSMENT: PRINCIPLES, POLICY AND PRACTICE

INTRODUCTION

In this section of the review the broad question, 'What do we know about how young children engage with curricula in educational settings?' will be addressed. In particular the focus will be on research evidence of the appropriateness and effectiveness of models of early childhood curricula and related assessment systems in early childhood settings. The review of subject based research evidence includes literacy, mathematical, scientific, musical, physical and artistic development. Evidence of young children's development in technology, the humanities and religious/spiritual/emotional/social development has not been addressed.

Defining a knowledge base for early childhood education

The concept of the curriculum as socially organised knowledge is a critical starting point. The way in which knowledge is codified and accorded status is traditionally related to the values and power bases of dominant cultural groups (Young 1999). In UK education high status has been accorded to specialised subject knowledge characterised by distinct boundaries, lack of clear connections to 'everydayness' and prioritising disembedded, abstract knowledge over practical knowledge embedded in action (Bernstein 1971). There is an assumption (unsubstantiated by research) that an emphasis on raising standards in literacy and numeracy will impact on the economic success of a nation and the 'appropriate' behaviour of its citizens. High levels of funding for resources (staffing, training, materials, activities, assessment) have been assigned to promoting progress in the 'basic skills', defined as literacy and numeracy, and formidable inspection and testing regimes established to measure their delivery. There is a question as to whether 'curriculum' is an appropriate term to describe the most significant features of a learning environment for children under three (Stonehouse 1999). Nevertheless 'learning' is on the agenda for under threes. The POST report (Blakemore 2000) refers to the importance of early learning (birth to three years) and the draft national day care standards (DfEE 2000a) refer to care and learning from birth. One of the strands of the Surestart intervention programme (www.dfee.gov.uk/sstart) for families living in poverty with children under three is to improve access to good quality play, early learning and childcare opportunities.

A curriculum for five- to seven-year-olds in the UK

In September 1989 a Key Stage One National Curriculum was introduced to five- to seven-year- olds. The framework has the three core subjects (English, mathematics and science), six of the seven foundation subjects (not modern languages) and religious education. Seven-year-olds are tested on Standard Assessment Tasks in English and Mathematics (Science tests were abandoned in 1993). The Literacy Hour was introduced in 1999 and the Numeracy Hour in 2000 for all five- to seven-year-olds. Many Local Authority advisers and headteachers strongly advised Reception class teachers to introduce literacy and numeracy hours to the many four-year-olds starting school early. Targets in English and mathematics are set centrally by the Department for Education and Employment (DfEE) for LEAs and local authorities negotiate local targets with schools to government requirements.

A curriculum for three- to five-year-olds in the UK

During the last two decades government policies have impacted on curricula models at 'preschool' level for three to fives. In effect their education was re-framed as a preparation for formal schooling. By 1992 there was evidence that the National Curriculum was impacting on non-statutory early years settings (Sylva et al 1992) and on the curriculum offered to four-year-olds entering primary school Reception classes (Cleave and Brown 1991a; 1991b). The Desirable Learning Outcomes introduced in 1996 (DfEE/SCAA 1996) and the Foundation Stage organised into six areas of learning with related Early Learning Goals for under-fives introduced in 1999 to early years settings offering an educational component in England and Wales(QCA/DfEE 1999) outlined six broad 'areas of learning'. Personal and social skills (1996) and personal, social and emotional development (1999) headed the lists. However, the introduction of Baseline Assessment for all children at school entry prioritised standards in early literacy and numeracy, with less attention paid to scores in social development (see the section on Assessment). An inspection regime of all preschool settings offering educational experiences for under-fives (from 2001 to be managed by Ofsted) emphasised the importance of the quality of pupil learning experiences in literacy and numeracy (Ofsted 1998; 1999). Understandably practitioners put their efforts into teaching aspects of the curriculum for which they were held publicly accountable (Anning and Edwards 1999). However, anxiety about the negative effects of 'too formal too soon' has led to the DfEE establishing a Foundation Stage for under-fives, and includes the Reception class year for four-year-olds (QCA/DfEE 1999). In Scotland the Curriculum Framework for Children 3 to 5 (Scottish Consultative Council on the Curriculum 1999) offers a broader curriculum framework based on key aspects of children's development and learning. As the statutory school starting age is four in Northern Ireland, four-year-olds tend to be inducted early into formal schooling.

In early childhood settings, by folklore and tradition, areas of knowledge are not normally taught in subjects; more often in themes, topics or areas of experience. Children and adults 'everyday' activities are used as the basis for planning. Practical 'experiential' learning is prioritised over abstract, disembedded knowledge. Sensory experiences are valued. Children are encouraged to make choices in what they learn at least for some part of each day. Advocates of a developmentally appropriate curriculum argue that the education of young children should be conceptualised as a phase with a distinct conceptual framework based on evidence of how young children learn and develop (Bredekamp 1986; Blenkin and Kelly 1994).

Research into aims of early childhood workers in the UK show that they consistently rank emotional, social and physical as well as language development as priorities (Taylor et al 1972; Bennett 1987; Hutt et al 1989; Blenkin and Kelly 1997).

Alternative curricular models for young children

There are alternative ways of conceptualising curricula for early childhood education. In fact, although there is a paucity of research about the impact of the curricular models adopted by pioneers such as Froebel, Montessori, Steiner, McMillan, Isaacs and others (see Curtis 1986), their writing provides evidence from which we can deduce the aims of their provision. In addition, there are more recent, psychologically based models such as the High Scope curriculum (Hohmann et al 1979) in which knowledge is codified as nine key areas of experience, initiated in USA but influential in the United Kingdom. The USA based Howard Gardner's (Gardner 1993) Multiple Intelligences is gaining in influence in the UK, particularly through initiatives promoting Accelerated Learning. Kieran Egan's (1988) 'storying' model based on the power of narrative in learning has had less impact. There is interest in children learning how to learn in the USA (Dweck 1986). There have been skills based models outlined in the UK such as Curtis's (1986). In Northern Italy the Reggio Emilia approach (Edwards et al 1998) to extending children's understanding and knowledge rejects the idea of 'delivering' a pre-determined body of knowledge to young children and this work is being developed in the UK via the BAECE Sightlines Project in Newcastle-Upon-Tyne. In this model the theories of adults and children are constantly tested against the evidence of phenomena and debate situated in their cultural context. Elfer and Selleck's (1999) work on constructing a rigorous process of self reflection on practice with children under three is consistent with Dahlberg's (2000) description of the Reggio Emilia approach. Athey's (1990) work on schemas and Goldschmied and Jackson's (1994) work on heuristic play for babies and toddlers have been influential in curricula models in preschool and day-care settings.

Work by Walkerdine (1981), Browne and France (1985*)* and Penn and McQuail (1997) in the UK and in Australia by Davies (1989, 1993) and MacNaughton (2001) questioned the gendered nature of early childhood curricula. Other work has been published on developing multi-cultural curricula for early childhood settings (Siraj-Blatchford 1996) and Skelton and Hall (2001) have reviewed literature/studies which address the development of gender roles in young children.

More recently there have been attempts to base curricula on professional/practitioner consensus about an appropriate knowledge framework for early childhood settings where 'colonisation' by Education is being contested. The Quality in Diversity curriculum drew heavily on the New Zealand Te Whaariki model (Early Childhood Education Forum 1998). It involved eighty 'experts' in early childhood education working together between 1993 and 1997. Work at Goldmiths University College through the Principles into Practice (PIPs) project (Blenkin and Kelly 1997) was based on a survey of the attitudes of practitioners in 2,420 early years settings (for which there was a 25% return rate), follow up interviews with eleven head of settings and action research in these settings. Anning and Edwards' (1999) worked over eighteen months with twenty-four members of multi-disciplinary educarers drawn from three Local Authorities to design a curriculum based on practitioner beliefs/practices. In 1994 the DfES initiated a Centre of Excellence programme to promote models of high quality, integrated early years services for young children and their families. In the evaluation of the impact of the Centres of Excellence (Bertram and Pascal 2000) the focus has been on the processes by which services are delivered. Little attention has been paid to gathering evidence of changes in models of curricula or pedagogy.

Impact of curriculum models and organisational structures on pupil gains

Three- to five-year-olds

Debates about the relative merits of subjects or 'developmentally appropriate practice' approaches to curricula for under-fives have been stronger on assertion than evidence. What evidence there is conflates the effects of attendance at types of preschool settings with the effects of educational experiences there.

Sylva et al (1980) analysed several hundred hours of systematic observations of under-fives in playgroups and nursery schools and demonstrated how the structuring aspects of children's experience impacted on cognitive gains. The key factors were:- the time children spent on activities; the quality of interactions with adults and peers; the learning environment; and the nature of different curriculum tasks. Cognitive gains were measured by perseverance on task, complexity of play behaviours and language use with adults and peers. At school entry children who had attended nurseries, rather than playgroups, were more likely to initiate contacts with teachers that were 'learning orientated' rather than asking for help and used more persistent and independent strategies when they met obstacles in school activities. In a 'quasi experiment' Jowett and Sylva (1986) studied ninety working class children transferring to school, half with playgroup and half with state nursery education experience. Measures of 'school readiness' indicated that those with nursery class experience settled into school better, played in more purposeful and creative ways, persevered longer at challenging tasks, engaged in more connected conversations and were more motivated to learn. Hutt et al (1989) compared the school entry behaviours of children who had attended four types of nursery provision – eight nursery schools and classes, right playgroups and six day-care settings. Children with nursery school or class experience showed only slight differences, the most significant being that those children (particularly boys) made more verbal bids for attention and consequently gained more teacher time. Effects were soon 'washed out' as children were socialised into appropriate school behaviours. Large scale analyses drawing on national data banks such as Standard Assessment Tasks at seven (Shorrocks et al 1992) and Baseline Assessment (SCAA 1996) indicate that attendance at any kind of preschool is positively associated with children's scores regardless of the pre-existing differences in gender, ethnicity, class or age of entry of groups.

Findings from the large scale Effective Provision of Preschool Education (EPPE) Project (Sylva et al 1999) aims to provide more robust evidence and through multi-level modelling disentangle the impact of attendance at types of settings from the quality of learning experiences within and across the settings. It is a longitudinal study of 3000 children from the ages of three to seven as they move through preschool and school systems. The EPPE project is using a broader range of measures of 'impact', including social/emotional criteria, than the predominantly school educational criteria used as indicators of effectiveness in the other research studies cited. The EPPE team have designed additional subscales (ECERS-E) to supplement the ECERS-R (Harms et al 1998) measures of quality of settings to collect more detailed and UK specific information about the educational aspects of provision. ECERS-R scores for activities and facilities were lowest for playgroups and next lowest for Reception classes and private day nurseries. Next nursery classes and local authority settings ranked equally. Nursery schools and Combined Centres scored highest. ECERS-E scores from the different early childhood settings, though showing similar trends, did not score significantly differently on the educational subscales (Sylva et al 2001). A parallel study, the EPPNI project, has been funded in Northern Ireland (Melhuish and Quinn 2001).

The pattern of admitting all four-year-olds into Reception classes in September in England generated a spate of research evidence about the inappropriateness of much of the provision including curriculum models. An NFER study based on surveying 108 local authorities in England and Wales and case studies of twelve schools in two LEAs (Cleave and Brown 1989; 1991; 1991a) identified lack of space, limited access to outdoor play and teaching assistants, and 'inappropriate' curriculum activities and teaching methods as features of many four-year-olds' experiences in reception classes. Pascal (1990) identified problems in curriculum delivery caused by the staffing of reception classes by teachers not trained for early childhood settings. Bennett and Kell's (1989) research involving interviews with headteachers and at least one teacher of the four-year-olds in sixty schools (twenty in each of three LEAs) and observations in eighteen of the schools confirmed the NFER findings on the inappropriate nature of curriculum activities offered daily to four-year-olds. Further research (Bennett et al 1997) reported in depth on nine reception class teachers' espoused theories about play and how difficult they found it to translate their beliefs into teaching strategies and curriculum activities in their classrooms. The concern about inappropriate curriculum and pedagogy for four-year-olds in primary schools in the UK has fuelled the 'too formal too soon' debate. Comparisons have been made with school systems where children start formal schooling at five, six or even seven (Mills and Mills 1998) and yet achieve 'better' later school attainments. However, school starting age and later achievements are not necessarily causally linked.

Relationships between preschool experiences and later achievements are complex. For example, we might try to argue that children in Belgium are showing higher levels of achievement in school because of a less formal approach to their preschool curriculum. However, the real effect may be the much higher ratio of adults to children in Belgium preschools. Claims made about the effectiveness of the High Scope curriculum (Schweinhart and Weikart 1993) in USA preschool intervention programmes have been influential in guiding government policy. However, the fact that parents were so intricately involved in the delivery of High Scope 'knowledge', or that the staff in the initial programmes were highly motivated and well trained postgraduates, may have been more influential on children's long term social and life skill gains than the way the curriculum was framed or taught. Ramey and Ramey (1998) argue that fragmented short term early intervention programmes are unlikely to succeed in improving children's cognitive, academic and social outcomes, whereas intensive high-quality, ecologically pervasive interventions can and do.

Five to seven year-olds

Within the 'school effectiveness' paradigm, Tizard et al (1988) reported on all children starting school in thirty three London schools in September 1982, tracking their progress in English, mathematics and social development over three years. Children's achievements at school entry and particular teachers and schools affected children's progress. The findings include evidence of three hundred and forty three children's responses to variations in curriculum coverage. Some worrying patterns of differential gender and ethnicity achievements emerged. The two major factors associated with progress were the range of curriculum activities assigned to children and the expectations teachers had of children. By age seven black girls were ahead of all other groups in both reading and writing, whilst black boys were doing worst. Both black and white boys made more progress than girls in mathematics, with white boys making the most progress. The children were asked to record preferences for curriculum experiences but only within a narrow set of choices in 'basics'. Their preferences for activities were for mathematics (80% of boys and 62% of girls), reading aloud to the teacher (70% of black children and 60% of white children) but not reading alone (51% of all children). The least preferred was writing (56% of all children). The reasons given, predominantly by the lower achievers, for not liking reading alone or writing were frustration at not being able to succeed in them. Work done ten years later under the auspices of the Performance Indicators in Primary Schools (PIPS) project (Tymms et al 1997; 2000) at Durham University replicated Tizard et al's (1988) findings that schools, as well as pupils' prior attainments on entry, affected children's progress at Key Stage One. There were long term benefits (as measured by Standard Assessment (SATs) results at age seven) in terms of achievement in reading and mathematics from attendance at a Reception class with high value-added scores at the end of the first year in school.

A cluster of research projects were funded to monitor the impact of the introduction of the National Curriculum to five- to seven-year-olds in the 1980s and 90s. The Primary Assessment and Curriculum Experience (PACE) project (Pollard et al 1994) had a longitudinal and cross-sectional research design. One hundred and fifty teachers from forty-eight schools in eight LEAs were surveyed. The perspectives of nine teachers for each of the years of the project, and within their classes of six children in each school as they moved through Key Stage One were investigated. Nine from the sample of schools were

selected for detailed observational studies. The research captured evidence of the impact of curriculum change on classroom practices and the teachers' and children's views about these changes. The children were asked about their curriculum preferences in an open ended way. They responded that they most liked physical education, then maths, home corner play, painting, singing and reading alone. They least liked writing stories and science. Similar preferences were expressed by three hundred and twenty seven Year Two children surveyed by Davies and Brember (1995) and three hundred and sixteen by West et al (1997*). The* latter also showing that children enjoyed work with computers. Common to all surveys of children's responses to aspects of the curriculum is that they rate positively activities which involve high levels of active involvement and autonomy but are well matched to their capabilities.

Though the teachers in the PACE project broadly welcomed the National Curriculum, it caused a major shift in their planning and practice from integrated topic based approaches to stronger subject based classification and towards more formal pedagogy. As the pressure built in schools for seven-year-olds to score well in Standard Assessment Tasks (from 1991 school Key Stage One SATs results were being published as league tables) curriculum coverage focused more on activities leading to progress in testable outcomes. A smaller scale study in Wales based on questionnaires and interviews over a three year period with headteachers and Year One teachers in twenty six schools in South Wales LEAs included questions about curriculum changes from the National Curriculum and its impact on children (Cox and Sanders 1994). The teachers in Wales reported a move towards subject based planning and teaching, tighter structuring of curriculum activities and a greater emphasis on assessment. The Leverhulme Primary Project (Wragg et al 1989) surveyed nine hundred and one teachers' responses to the National Curriculum from one hundred and fifty two nationally representative schools in England and Wales and reported similar findings. However, a study of the perceptions of thirty Key Stage One teachers in England of the impact on their working lives and the children's experiences of schooling of the National Curriculum reforms in the early stages of its implementation (Evans et al 1994) found that the amount of time allocated to subjects had shifted very little over two years of reform though there was strengthened emphasis on science and the new subject technology. It seems likely that changes to Ofsted inspection schedules as the reforms bedded into accountability systems were more likely to change practices in curriculum delivery than government policy changes.

Since this spate of research interest in the initial impact of the reformed curriculum for Key Stage One data, rather than anecdotal evidence about subsequent changes, particularly since the introduction of the National Literacy and Numeracy strategies, has been available only from annual Ofsted reports. An emphasis on the short term elevation of national standards in literacy and numeracy at ages seven and eleven has dominated policy and practice in England and Wales. Little research funding has been allocated to inquiry into broader aspects of educational gains. The EPPE project may be funded to follow up a sub-sample of the three thousand children beyond the age of seven to investigate links between types of early years education and longer term achievements. The National Evaluation of Surestart (www.ness.bbk.ac.uk) includes a longitudinal study of nearly twenty two thousand under-threes living in the most deprived areas of the country from one hundred and fifty Surestart programme areas and fifty Surestart to be areas over a six year period. The children will be assessed at regular intervals on standardised measures of cognitive and social/emotional achievements. Evidence may emerge from the NESS findings of relationships between quality of preschool experiences and children's educational achievements.

ASSESSMENT

Introduction

The recent explosion of interest in the assessment of young children can be tracked back to the present and previous governments' drive towards improved standards through inspection, testing and accountability. In England the national tests of sixteen and eighteen year olds have filtered down to the ages seven, eleven and thirteen following the Education Reform Act of 1988 and then, in 1998, to the statutory assessment of children on-entry to school. This flurry of national assessment activity has raised the profile and urgency of assessment in the early years and it is in this context that research and practice must be located in England. Within Scotland, assessment in primary schools has not followed the same pattern, with no requirement that pupils are assessed on entry and no publication of test results in league tables. This has created a quite different climate within schools (Tymms and Wiggins 2000). In Wales a compulsory baseline scheme started a year later and there was a single scheme as opposed to the ninety different schemes used in England. Although Northern Ireland has less formal assessment throughout the primary years than in England and Wales, there are still selection tests at the end of primary schooling. Northern Ireland recently decided to discontinue league tables because of disquiet from school staff and parents about their effects on schooling and in 2002 the Welsh Assembly discontinued national assessments during KS1 – although there are reports of local authorities continuing to ask for assessment results.

Assessment in the early years can be seen in a broader perspective to have its origins in three different strands. First there is the informal assessment by practitioners, which arises spontaneously and is often not documented. Then there are the 'diagnostic' assessments of educationalists, psychologists and psychiatrists. These were created partly for research purposes (to help understand the development and education of young children), partly to help teachers teach, partly for evaluation purposes and partly to assist in clinical practice. Thirdly, there are the physical assessments by doctors, paediatricians, health visitors and educators, mainly intended to identify any potential learning difficulties so that they can be remedied as soon as possible.

Baseline assessments, can be seen as evolving from practitioners' assessments and from health workers/educationalists/psychologists' assessments. The term baseline can be very confusing since it can be used to denote the collection of data at the start of anything. One can have a baseline for a term, a lesson, a degree course or even the rest of one's life! In the UK it has more commonly come to refer to the assessment of children when they start school. It might more clearly be called 'on-entry' assessment.

Baseline assessments in the 1970s were used mainly by educational psychologists to identify children with special educational needs at an early stage (Lindsay and Desforges, 1998). Detailed work made it clear that early identification of SEN was problematic since there was invariably a high proportion of false positives and negatives. The use of baseline assessment specifically to identify special needs gradually faded. The changes in the purposes of baseline have been well documented. (Blatchford and Cline 1994, Lindsay and Desforges 1998, Nutbrown 1997, Tymms, 1999, Wolfendale 1993). During the 90s the use of informal and formal on-entry assessment became more widespread. It became official in England, Wales and Northern Ireland in the sense that all mainstream schools were *required* to carry out baseline assessment with their pupils, using an accredited scheme for all children on entry to primary school. Some of the ninety schemes were essentially a formalisation of practitioner-based assessments. Others were created more along the lines of the assessments of educationalists and psychologists.

The most recent development in England has been the introduction of the Foundation Stage Profile, to start in 2002/3, continued through from age three to five. The continuation of forms of on-entry baseline assessment are encouraged but will not be required to be officially reported.

Types of assessments

Practitioner assessments

As was noted earlier the spontaneous assessments of practitioners, which are a necessary aid to the day to day planning by practitioners, are often not recorded. Nevertheless, some examples of this activity can be seen in many of the ninety accredited schemes of England. These schemes, (see Wolfendale 1993) for a review), are generally based on the judgement of teachers and others, sometimes including parents, and have usually not involved attempts to assess the quality of the assessments in term of reliability and validity.

Assessments of educationalists and psychologists

Numerous objective assessments have been developed in the UK by educationalists and psychologists. These may be characterised as having been produced in the scientific tradition developed to generate high quality data, and they usually report measures of reliability and validity. Most developers of these assessments would probably agree with Ramachandran and Blakeslee (1998:234) that 'reductionism has been the single most successful strategy in science' and that the tests created test specific aspects of the young child's capabilities. Work involving such assessments has often aimed at understanding some aspect from a wide variety of young children's lives and development but it has also involved attempts to improve educational provision through professional monitoring with feedback. Several examples of assessments relating to the development of literacy and numeracy may be found in Tymms (1999).

Physical assessments

The earliest physical assessments are of babies at birth when their heights and weights are routinely measured. Checks are also made for a variety of organic abnormalities including hearing loss. Heath Visitors make home assessments at regular intervals, which look at the general development of the child, and at specific issues. Physical assessment is often ignored in educational settings although there is clear evidence that it is related to academic success and that interventions can have a positive impact on co-ordination.

Baseline assessments

On-entry baseline assessments have essentially evolved from other forms of assessments. Most of the assessments are broadly aimed at the cognitive and behavioural areas. In the cognitive areas this is largely verbal and early literacy assessment, alongside assessments of mathematical development. There is evidence that the items on Baseline Assessment schedules favour activities preferred by girls (Arnot et al 1996) and that girls are regularly out performing boys in social skills, letter identification, writing and drawing. On the behavioural side the focus has been on personal, social development and more recently emotional development. (Lindsay and Desforges 1998; Tymms 1999)

Impact of assessment in the early years

Many of the issues surrounding the assessments are debated in academic journals but they spill over into the wider world when the assessments become formal requirements and are conducted by practitioners. When this happens the views of practitioners are clearly important. From1998 Tymms and Stout (Stout et al 2000) conducted three years of surveys of a nationally representative sample (n=177,148 and 125 respectively) of reception teachers asking about their perceptions of baseline

assessment using a series of semantic differentials in which they chose a point between two extreme positions to represent their views. A snapshot of the results is shown below.
About assessing children on-entry to school

Essential	X							Unnecessary
Valuable	X							Waste of time
Helpful	X							Hindering
Labelling			X					Diagnostic
Constraining			X					Enabling
Imposed			X					Sought

The chart graphically shows not only the average response of practitioners in schools but also sets out some of the key issues as dichotomies. Teachers from this nationally representative sample were predominately of the view that baseline assessment was a positive thing and did not regard the negative possibilities as dominant. But that does not put an end to discussion. The figures shown above were averages – many practitioners did not fit the pattern shown above.

The major issues surrounding the use of baseline assessment must concern the impact on children. Does the assessment cause harmful stress to the child and/or the teacher? Does assessment focus attention inappropriately on the easily measurable? Does assessment help teachers identify important issues? Are some children's lives enhanced because early assessment spotted something that was sorted out at a crucial early stage? Are some children's lives blighted due to unwarranted labelling? These and other questions need to be debated and researched to address arguments for and against different policies on assessment. In reality we cannot know the impact of a policy, such as the introduction of baseline assessment, whatever its form, without trying it out in a controlled fashion. This has never been done, nor has any comparison of the cost effectiveness of approaches to assessment been carried out.

Assessment (summative and formative) and special educational needs
Most of the current interest and investment in assessment and testing is in measurement, certification and accountability and thus in summative assessment steps. Summative assessment emphasises normative judgements and weightings that are usually predetermined by previous policy makers and educationalists. Thomas and Loxley (2001) argue that such assessments do not merely describe but also construct that which they set out to describe. Their use as a reference point for measuring and recording children's 'ability' is delineated by what is **perceived** as desirable sets of knowledge and understanding to be held by children at certain stages of their educational career. Assessment used as the basis for decisions made about a child's educational ability, leads to classification, ranking, comparing, and distribution of individuals relative to what is deemed 'normal'. Within our current education practice, assessments are given particular relevance at transition stages and are used to suggest suitability for particular educational provision, for example, mainstream or special school (Buck and Youngman 1996) and, according to Buck (1999) to determine the 'resource worthiness' of children with SEN.

Summative assessment procedures have been utilised under the Code of Practice (1993) and the subsequent identification and planning for children with SEN and this seems set to continue under the new Code of Practice to be introduced in 2002 (DfEE 2000). Rueda and Mehan (1986) point out some of the complicating factors in effective assessment, such as the influence of the child's ability to understand and utilise social interchanges. This is particularly true when testing young children or pupils with autistic spectrum disorders where environment and social and emotional needs have a major impact on children's understanding and hence performance.

Specialised summative assessments designed to identify where children's difficulties lie and then prescribe programmes of help are used alongside regular assessment procedures. This suggests that these children are seen as needing a very different form of assessment, curriculum and perhaps even teaching compared with children seen as not having difficulties. This form of assessment generally uses the medical model of disability and supports the notion of the child not fitting the education system rather than the notion of the system not being flexible and diverse enough to enable the child to learn in any educational environment. Lewis (1996: 13) argues that summative assessments are likely to disadvantage pupils with SEN and that moderated teacher assessments are likely to be fairer to pupils 'and more consistent with the ethos of inclusive schools than statutory tests used to date'. This view is supported by the work of Thomas and Loxley (2001) who suggest that:

> 'the brood of evaluations undertaken in the mid seventies and since show that help based on this kind of approach is no more effective than help based on the teacher's own gut assessment of the difficulties and his or her own solutions to it ' (Thomas and Loxley 2001: 2).

EARLY LITERACY

The importance of the effective teaching of literacy has received considerable emphasis, particularly in western societies, given the difference that being fully literate makes to both the life chances and personal enhancement of the individual and the economic health of a society. In the final thirty years of the twentieth century, insight into the way that young children become literate expanded hugely. Educationalists are greatly indebted to the vast body of research undertaken in order to inform our understanding about the teaching of and learning about literacy, both in the home and in early childhood settings.

Research findings have provided evidence firstly, that proficiency in written language builds on well-developed spoken language and secondly, on the ways through which children learn to read and write. It is now appreciated that the literacy process involves complex, cognitive functioning, which is composed of an interrelated array of skills, dispositions and attitudes, which interact powerfully together. In order to address this complexity and multi-facetedness, the review will attempt to answer three main questions:

- what do children need to understand before they can learn to read and write
- what do they have to be able to do to become literate
- what type of adult support and environment best supports literacy learning

The review will, of necessity, be highly selective given the plethora of research in the field. Each question will cite landmark studies from the early part of the last thirty years, but the main focus will be on more recent research from the nineties which was undertaken in order to build on the earlier seminal work.

The conceptual issues which underpin being literate

Fundamental understandings need to be in place before progress with learning to read and write can be made, and within these concepts layers of complexity are encompassed. Young children have to grasp the primary concept that print is speech translated into a permanent form and that this transformation involves the use of an artificial writing system. If the essential concept that print has a communicative function is taken as the starting point on the path to becoming literate, then an appreciation of the cultural conventions of a particular writing system follow and then the unravelling of the still more complex concepts are meta-linguistic issues. These understandings cover issues such as the fact that a word represents a unit of meaning and a letter represents a unit of sound within a word, and conversely, that punctuation symbols do not represent any sounds of language at all. Rigorous quantitative research studies into young children's grasp of the conceptual issues regarding the nature of written language and the generation of texts gradually informed teachers and early childhood practitioners on the ways that children become aware of the complexity that literacy entails (Clay 1966,1972; Reid, 1958,1966; Downing, 1979).

Cognitive competences, learning dispositions and skills required when learning to read and write

Problem-solving skills

Ferreiro and Teberosky (1982) carried out an ethnographic study which provided evidence of the active meaning making and problem-solving that young children employ as they experiment with mark- making in order to communicate through written language and so represent spoken language. These researchers, through their meticulous recording of observations, showed how children worked at 'finding' their way into the alphabetic code system.

Phonological awareness

There is a substantial body of experimental psychological research evidence that indicates that it is essential to be able to discriminate the individual and constituent sounds in words (phonemic awareness) in order to be able to both decode and encode fluently and speedily. Bryant and Bradley (1985) and Bryant et al (1989) in their seminal study demonstrated the relationship between the preschool child's ability to identify rhyme and alliteration and early successful reading. This aural acuity, the researchers argue is the precursor to full phonological awareness. Building on this work, Goswami and Bryant (1990) focused on the child's ability to use analogy to read words not previously encountered. They showed that young children can puzzle out a word with the same rhyme (final syllable) as in a known word by recognising and remembering the ending (e.g. c-ook from l-ook). This again points to the importance of children being able to identify and be aware of the separate units of sound in the first instance.

The inter-relationship of phonological awareness and orthographic awareness

As young children develop a clear view of the relationship between spoken and written language, they pass through stages of awareness of the precise way that print and sound map onto each other. Quantitative research studies such as Bryne (1991) offer more evidence on the nature and the path of children's grasp of the alphabetic code with all the inherent vagaries of the English language system. Ehri (1992) built on Frith's (1985) earlier framework. Both these researchers demonstrate the way that the young child's phonological awareness supports orthographic awareness and vice versa as the understanding of both become more refined through the activities of reading and writing. Riley's (1996) school based research on the transition from emergent literacy to conventional literacy behaviours is also a useful resource for practitioners.

The type of environments and adult support which facilitate literacy development

Changes in research paradigms in relation to emergent literacy over the last two decades have repositioned a conceptualisation of young children as active agents in their own learning of literacy. It is now clear that children apply the same formidable problem- solving capacity as they strive to make sense of print and text as they apply to other aspects of learning about the

world (Ferreiro and Teberosky 1982; Bissex 1980). Learners do this most successfully when sensitively supported by more knowledgeable and experienced language users (Wells and Raban 1978; Wells 1987).

The child's individual context, which encompasses both the home environment and access to personally significant adults, therefore, is highly influential. It is this context which can provide the opportunities for sustained literacy experiences. Clark's (1976) seminal study looked at the home environments of children who had arrived at school already reading fluently and showed that seeing adults engaging with literacy in many useful and enjoyable ways, and the positive attitudes their parents demonstrated towards literacy was powerful in enhancing the reading performance of the children. Stainthorp and Hughes (1999) replicated Clark's work two decades later with similar findings. Exposure to and experiences with print in all forms featured significantly, as did the children's skills in phonological and alphabetic awareness. However, both studies were unable to answer the question of just how the children came to have these precocious abilities. Further evidence that learning to read does not happen through encounters with books alone, is found in Weinberger's (1996) study which draws attention to the ways in which children's later achievement in literacy in school is linked to wider early literacy experiences, such as parents pointing out environmental print and the number of nursery rhymes known. This study also offers evidence for the intergenerational transmission of literacy difficulties within families associated with different socio and cultural literacy practices. Hannon's (1995) work on the role of parents in their children's literacy development recognises the importance of parents finding opportunities for learning, recognising their children's achievements, having interactions around literacy activities and modelling literacy behaviours. The concept of 'recognition' has been developed in the Raising Early Achievement in Literacy Project (REAL) (Nutbrown 1997; Nutbrown and Hannon 1997).

Bilingual learners

Work conducted by Gregory (1996) on the progress of bilingual children learning literacy in an additional language to their community tongue has affirmed the ability of very young readers and writers to make sense of the written forms of the new language, and frequently to those written also in different script. Much that is valuable for monolingual learners holds true but what is important is an explicit building on the rhythms and patterns of spoken language which has proved to be especially beneficial with bilingual children. These readers tend to have well developed decoding skills but weaker 'top-down' processing which is supported by context of the text and deep knowledge of the structures of language.

The experiences of preschool children include a variety of socio-cultural dimensions, which in turn, will have different influences on literacy development. Minn's (1997) study of five preschool children has raised awareness about individual differences in cultural learning patterns in literacy, although many common experiences were shared; these included media literacy and everyday reading and writing experiences. The important role of older siblings is also recognised. Both Minns and Gregory (1996) draw attention to the cultural mis-match that can occur between home and school literacy experiences, which can disadvantage emergent bilingual readers and writers. Purcell-Gates (1996) also studied the nature of the different emphases placed by various communities on particular literacy practices. The learning which occurs reflects the level of the adults' literacy, its saliency in their lives, the attitudes of the caregivers to literacy, their reading interests and preoccupations. Senechal et al (1998) showed that children are highly sensitive to the nature of the emphasis of the various experiences. Senechal et al attempted to quantify and to differentiate between the particular contributions that the reading of stories and the direct teaching of preschool children make to the level of success at school regarding oracy and literacy. The distinction between the informal and the formal, is whether the focus of the experience offered the child is on the message contained in the print or about the print itself. These different experiences are related to the development of a range of literacy related skills, some of which are more facilitative and beneficial for the child when arriving at school than others. The important implication of this work is that reception teachers need to be aware of the literacy knowledge that the child has acquired before school entry in order to support most effectively further progress.

Implications of Research

This review of selected research has affirmed young children as active literacy learners and problem solvers who are able to engage in the formidable task of making sense of a complex system of spoken and written language. The evidence available supports the view that in the earliest years this is most likely to take place in a literacy rich environment where learning is supported by a receptive and psychologically available adult. A clear message from research is that individual literacy contexts will vary according to socio and cultural practices and that adults working in early childhood settings need to develop shared systems of understanding about literacy with parents and carers.

MATHEMATICS DEVELOPMENT

The context

Traditional research on young children's early mathematical development excludes the context of learning as a source of knowledge. This may underplay the extent to which maths is a socially- and culturally-defined activity. Many researchers (Hughes 1986; Nunes and Bryant 1996) have argued that we need to help children bring their everyday understanding of maths into the classroom. In this view, maths learning is less the transmission of facts and more 'situated practice' (Lave 1990:309). *How* children learn maths becomes as important as *what* they learn. Assessments and clinical interviews tell us *what* children know. Conversation analysis and ethnomethodology tell us something of *how* they learn. The questions we address in this section of the review are:-

- how do children engage in (mathematical) learning experiences in preschool and home settings and how can their learning be enhanced?
- how do adults help children learn about maths in different kinds of settings?
- what are the features of appropriate mathematical learning for under-threes, under-fives and under-eights?

The answers to these questions are reached through detailed studies of individuals and their social contexts. Such studies are typically ethnographic in approach, though qualitative and quantitative methods may be used. They tend to be small-scale, yet time-consuming.

Young children learning in the home
A number of studies have described the nature of number learning in the home. Durkin et al (1986) analysed mother-baby videotapes. He saw age-related changes in the kinds of counting toddlers produced and in the social context of their number use. Below twenty-four months they produced number words either singly, in conversation, or as part of routine expressions such as, 'one, two, three, go'. Between twenty-one and thirty months, reciting the count sequence became common while they were playing with a parent. In their third year, they used number terms in conversation as well as in a count sequence, indicating a very early intention to quantify, but enumerated without counting when they dealt with very small sets. Many uses of number were observed, and many ambiguities in parental input which led to mismatch of behaviour between participants.

Young (1995) kept a diary of his children's mathematical experiences at home over twenty months and collected diaries from six other families. He made video recordings at home, playgroup and nursery, and interviewed forty-six adults in these contexts. Though the style of home and preschool experiences was similar, there were more adult-mediated number experiences in preschool than at home. Adults believed that children needed to know only how to recite to twenty, count in one-to-one correspondence to ten, recognise small quantities and possibly recognise the first ten digits. Once children could do this, adults' mathematical support lessened. Bottle (1999) used observation, interview and diary records of six families to study maths in the home during children's preschool years. All families reported carrying out mathematical activities and the researcher observed this to be the case – some adult- and some child-initiated. Only three of the families, however, recognised their importance for future educational achievement. Number and counting was mentioned most often. In both the Bottle and the Young studies, the quality and extent of maths experiences varied considerably from home to home.

Hughes (1986) analysed a large number of conversations between three- to four-year-olds and their mothers. He concluded that there were relatively few conversations where children's mothers were explicitly using the language of arithmetic.

Aubrey et al (2000) re-examined Gordon Wells' mother-child conversations from a mathematical perspective. The children were between eighteen and forty-two months olds. Taking the mid-point recording average, just 2.1 per cent of speech units contained reference to maths though there was some increase in this proportion with age. Most of the speech was related to number and counting. Conversations usually involved the focal child and parent – rarely, a sibling. There was adult-led and child-initiated talk about number. Children also counted to themselves and talked about size relations.
Studies of maths in the home show that

- adults mediate children's number experiences
- the frequency of mathematical experience varies considerably, and is often quite low.
- adults' expectations can be quite limited.

Learning and teaching mathematics in the preschool setting
With the introduction of a Foundation Curriculum, there is the potential to maximise mathematical learning. This does not always happen.

Munn and Schaffer (1993) studied two- to three-year-old children in ten Scottish day nurseries. They noted that number experiences were scarce relative to literacy experiences (occurring in only 5% of observation intervals). Very few activities explicitly dealt with quantity or comparison and very little talk was specifically about number or quantity.

Kleinberg and Menmuir (1995) worked on adult perceptions of maths in Scottish preschools. They asked seventeen adults in three preschools to record what they saw as mathematical events. There were 134 of these events, lasting from a few seconds to thirty minutes. Two-thirds concerned number and only seven were non-mathematical. Their context varied across the range of nursery activities. Staff tended to equate mathematical engagement with word use. They did not see non-verbal activities, or sorting and matching, as mathematical. Their event descriptions showed that many nursery staff have a view of early maths that is broadly similar to parents' views.

Munn (1995) examined the role preschool staff played in children's numeracy and literacy experiences. Discourse analysis of staff conversations and observations of children's play showed that there was a relationship between staff reflectiveness and the quality of children's literacy and numeracy experiences. Where staff used discourse between themselves as an aid to understanding children, then children's numeracy (and literacy) activities were more active and meaningful. Walkerdine

(1982) explored the impact of gender differences, as the quality of adult/child interactions around mathematical activities in preschool settings.

Learning and teaching mathematics in Reception classrooms
Aubrey (1995; 1996; 1997) and Suggate et al (1997) investigated the mathematics teaching of eleven reception teachers and their classes. Their work showed that

- children brought into school a rich informal knowledge of counting, numeral recognition, simple addition, subtraction and social sharing
- this matured considerably over children's first year at school.

Many entered school competent in simple calculation for real problem-solving. However, there was little evidence that these children carried out simple calculations in their reception classes. The curriculum emphasised play and teacher-led group work. Often the areas covered were those in which the children were already competent.

Learning and teaching mathematics in Key Stage 1 classrooms (five to seven-year olds)
In England and Wales, the National Numeracy Strategy has influenced the curriculum and emphasises number knowledge and calculation skills. There is little emphasis on problem solving.

Findings from two recent European projects suggest that this early focus on numeracy does lead to a short-term advantage in arithmetic skill. Pupils starting later, at six to seven years, however, make up this advantage within a few months. (Kavkler et al 2000; and Godfrey and Aubrey 2000).

Hughes et al (1999; 2000) have investigated different approaches to the application of maths at Key Stage 1.They find that children have difficulty outside school in using and applying knowledge to novel problem situations.

Brown et al (2000) have examined the production and implementation of the National Numeracy Strategy at Key Stage 2 (for seven- to eleven-year-olds), which has implications for the Key Stage 1curriculum. They conclude that changes in the curriculum might be valuable in the short-term for improving facility with mental calculation. In the longer term, however, 'there may well need to be a return to problem solving and investigation' (Brown et al 2000: 469). Brown et al (1998) conclude that if an emphasis on mental arithmetic leads to improvement, this may be at the cost of other areas that receive correspondingly less time.

In other parts of the English-speaking world, academics have produced interventions for children at economic and social disadvantage (Fuson 1997; Griffin and Case 1997 in the United States; Young-Loveridge in New Zealand, 1993; and Wright et al 1993, in Australia). These programmes, which have demonstrated gains for children in the lower ranges of attainment that are sustained, at least in the short-term, demand consideration of:

- maths as a subject;
- how to build on the knowledge children already have;
- how to help children learn new strategies.

The underlying models are varied, but there are commonalities in these number 'recovery' programmes which:

- include assessment material, curriculum resources and teacher education
- value the effectiveness of game-like formats.

Outside the English-speaking world, the Freudenthal Institute in the Netherlands is responsible for the 'realistic' primary maths curriculum (Gravemeijer 1994; Streefland 1991; and van den Heuvel-Panhuizen 1996). A broad theoretical framework provides a basis for an early years curriculum that:

- develops formal knowledge from children's informal strategies;
- relates school teaching to the real world, by using the children's everyday knowledge;
- allows children to contribute to the teaching/learning process;
- allows children to use their own mathematical tools to help solve real-life problems ('horizontal mathematizing')
- leads children from the perceived world to the world of symbols ('vertical mathematizing').

After more than twenty-five years the curriculum is still in a process of research and development.

Key points concerning mathematics
Having reviewed the research on mathematics in the early years, we can make the following key points:-

- adults mediate children's engagement with maths. The quality of adult support is very variable and depends upon their expectations and their reflectiveness
- preschool and home vary in the mathematical experience they provide. In general, organised preschool environments provide more learning opportunities than most home environments
- we do not know the ideal type or extent of children's mathematical experience in the early years.

However, we do know that:-

- under-threes need adults to converse with them about number
- under fives need teachers to recognise and exercise their number abilities
- under-eights need a curriculum that encourages them to apply maths to real problems.

SCIENCE

This section of the review is concerned with both learning and teaching science for children aged four to seven. The development of concepts is the main focus, but procedural skills and informal opportunities for learning have also been addressed.

The development of concepts

Piaget's work, particularly, *The Child's Conception of the World*, published in 1929, has influenced both educationalists and psychologists in their study of the development of scientific concepts in young children, Piaget's ideas about the active, individual constructing of knowledge together with his research instrument, the clinical interview, are widely acknowledged as the inspiration for a body of qualitative research by educationalists. The emphasis is on charting the development of concepts defined as 'scientific' in order to inform teachers of the knowledge to be expected and the identification of common misconceptions which can interfere with learning.

Within this tradition of research on the nature of knowledge in early science education, the science component of the National Curriculum was the stimulus for work in the early 1990s with young children in England. The Science Processes and Concept Exploration (SPACE) project covered ten science topics and related to the ideas held by children aged five to eleven. Leach and colleagues' (1995; 1996; 1996a) studies of the development of ideas about ecology from age five to sixteen followed a similar format. These cross-sectional studies were carried out with groups no larger than thirty encompassing a two to three year age span. Palmer et al's (1993; 1999) international longitudinal research project charts environmental understanding and is ongoing. It began with four-year-old children who were studied later at age six, eight and ten. It related to groups in excess of one hundred and twenty in the UK and USA and groups of over sixty in Slovenia and Greece. As one would expect, all these studies indicate that the general trend is for children's knowledge and understanding to increase with age. Most importantly for teachers is the finding that when responding to tasks, young children demonstrated that they knew much more than is commonly expected of them.

Developmental cognitive psychologists and researchers in the constructivist paradigm work from the belief that a young child's 'scientific' theories are constructed from their own experiences of and observations of phenomenon. They examine the normal, untutored trajectory of children's ideas. Much of this work is small scale, involving the comparison of groups of ten to twelve children at ages from four to ten years. A recent example is that of Slaughter et al (1999) who believe that preschoolers hold an intuitive theory of 'living things' which leads them to make unexpected statements; for example that certain inanimate objects can grow, eat and breathe. As 'factual' knowledge is gained, this theory is replaced by biological concepts.

Investigative work in science

The Exploration of Science project (Foulds et al 1992) studied children's performance on first-hand investigations. Two hundred and thirty five seven-year-old children took part in a science investigation to find out the answer to questions such as: *'Which car goes furthest?'* Many children made inappropriate plans and so failed to obtain evidence relevant to the problem. However, those who had identified the variables correctly were able to devise a fair test, manipulate the independent variable and recognise what had to be measured. Even so, less than seven percent made quantitative measurements using standard equipment. Instead they made comments such as, 'The green car goes furthest,' and tended to look to see whose car was the 'winner'. The majority drew a picture to record their work, omitting to make use of tables or graphs.

Approaches to teaching science

Associated with constructivism as a theory of learning is interest in the pedagogy of teaching science to young children. Murphy (1997) explored the perceptions of preschool staff of gender differences and their impact on play preferences, including science activities. Based on this perspective, the learner is helped to carry out first-hand explorations in order to bring to mind previous knowledge and ideas. These ideas are tested through experiment. The learner is then encouraged to develop a more 'scientific' view through discussion of the evidence. There is an untested assumption that discussion will lead to the development of 'scientific' knowledge. Interventions employed in the SPACE project followed this strategy. Although it was not possible to set up a control group, or to ensure consistency in application of the strategy, a relationship was assumed between children's responses pre- and post-intervention. For most topics effectiveness of the interventions was limited to children aged nine to eleven. Only for the topic, *Understanding Processes of Life*, did the children aged five to seven show significant gains.

Newton and Newton (2000: 599) describe understanding as 'the connecting of facts, the relating of newly acquired information to what is already known, the weaving of bits of knowledge into an integrated and cohesive whole'. From this standpoint they observed the lessons of fifty teachers with seven to ten-year-old pupils. The purpose was to record discourse that related explicitly to causes and reasons in science, rather than to facts and description. They found disappointingly low levels of discourse on the part of both teachers and pupils related to causes and reasons, especially with the younger children.

Informal learning in science
The School-Home Investigations in Primary Science (SHIPS) project indicated that parents' approach to tasks was influenced by their attitude towards science as either 'facts' or 'discovery'. They reveal 'the power of a home culture to imprint its own values and meanings on messages from the outside world' (Solomon 1994: 576). Similarly, Mayall's (1994) study of children's opportunities to learn about health indicate that they were offered more consistent messages at home than at school.

Some small-scale studies conducted in the London Zoo and in the Science Museum and an exploratory (Tunnicliffe et al 1997; Brooke and Solomon 1998) illustrate that conversations between children and their care-givers capitalise upon shared experiences and assist in the formation of meaningful links between new information and prior knowledge in science and that when play arouses curiosity it can lead to productive investigation.

Implications of Research about science education
Practical aspects of science education in early years settings meets the needs of young children for discovery and hands-on activity. Even though children learn much informally as well as in the classroom, teachers frequently underestimate the extent of their knowledge and understanding of phenomena.

ART
Recent publications concerning education and the Arts are of two main types. One type is hortatory in nature, reflecting on the importance of the creative elements in the education of the whole child, and offering alternatives and solutions to the predominance in the curriculum of linguistic and mathematical learning. The second type is a body of work reporting on curriculum development programmes which have been evaluated as successful in promoting children's understanding in art, music, drama and/or dance.

The few recent studies of young children's involvement in art activity, particularly in the UK, concentrate almost exclusively on children's use of and development in drawing. (Barrett and Eames 1996; Beal and Arnold 1990; Smith 1993; Silk and Thomas 1986; Thompson 1999). There is little attention to children's use of other media, although Matthews (1998a) discusses the use of paint and other media for very young children's mark-making. There is a body of psychological work dealing with the ways in which young children construct representations of specific objects. These tend to concentrate on particular types of representation – such as the ways in which children construct the human figure or represent aspects of perspective (Willat 1977). The developmental stance (stage theory) of this work has been critiqued by art educators such as Atkinson (1991) who points out that the concept of development used in many such psychological studies is predicated on a fixed and naïve view of an 'end-point' enshrined in representational art.

Psychological work in the area of how young children represent the world and their experience has been conducted by Cox and her research associates (Cox and Chapman 1995; Cox and Lambon 1996; Cox and Mason 1998). There is hardly any work that reflects on children's spontaneous art activity in early years educational or care settings. John Matthews' work is an exception to this. His longitudinal study (Matthews 1991) of the development of three children as art-makers highlights the role of adults in observing and supporting this development sensitively, and in providing opportunities for children to experiment with meaning-making through mark-making. He has conducted extensive study, both in UK and in Singapore (Matthews 1997; 1998; 1998a) which highlights the interactive element of young children's learning to use drawing and painting for representation and meaning-making.

Research into young children's use of mark-making but also manipulation of other materials in the exploration and development of meaning-making are reported by Anning (2000), Athey (1990), Nutbrown (1999), Kress (1997) and Pahl (1999). The focus is on the ways in which children develop concepts and the language for dealing with them rather than in the development of children's visual representations per se. Matthews and Jessel (1993) have explored young children's use of electronic paint.

MUSIC
Despite lip-service amongst early childhood practitioners to the importance of sensory and expressive experiences, music has played a limited role in early years classrooms. Young (2000) writes of 'a two-track' approach in music education for young children: firstly, the musical activities for children offered in most settings for under-fives but less frequently seen in infant classes; secondly, the adult-led performance of a limited repertoire of songs and rhymes. These two aspects are rarely, if ever, integrated and indeed have their roots in different traditions of early childhood education.

The stress placed on music by the pioneers of early childhood education has been attributed to a desire to use the capacity of music to control, soothe and create cohesion. Recent research underlines the way in which the intuitive understanding of the pioneers of early childhood education enabled them to identify experiences which were significant for young children's learning such as singing, music making or chanting rhythmically (Anning and Edwards 1999).Links may also be made with the work of Maclean et al (1987) on listening for rhyme in nursery rhymes as a precursor to aspects of literacy. Davies (1992)

research, focused on the invented songs of thirty two five to seven-year-olds, identified 'storysongs', 'framesongs' and free vocal play, the latter usually restricted to playgrounds, corridors or ends of sessions in classrooms.

The work of Sloboda and Davidson (1996) draws on the musical abilities of music students. Though not focused on early childhood, it does have implications for early years practitioners in that it emphasises the importance of the early musical experiences of musicians. The nature of the relationship with early years teachers and early experiences which emphasise the affective nature of music are seen as crucial elements in long-term interest and ability in music.

PHYSICAL DEVELOPMENT

Much of the recently published work in the UK in the area of physical development addresses two areas. The first looks at Physical Education as a national curriculum subject, emphasising the importance of physical education to develop pupils' physical competence and confidence. The second addresses motor impairment in children. Over the last few decades, the amount of research focussing on children with motor coordination disorders has steadily risen (Sugden and Keogh 1990; Sugden and Wright 1998; Wade and Whiting 1986).

There is very little research in the UK on young children's physical development. During this century, we have chronicled in great detail the changes children make in their progression toward competence in motor development. This detail has amounted to descriptions of changes that have taken place in the various phases of the child's development. However, explanations as to how and why these changes take place have been insufficiently explored. However, research studies from the rest of Europe and particularly from the USA show a resurgence of interest in physical development during the last decade. The research not only describes children's behaviour in more detail and with greater accuracy then previously, but also puts forward new ideas which have led to exciting theoretical concepts underlying the explanations of how and why children develop in physical capabilities.

Maturational models, such as those proposed by Shirley (1931), Gesell (1945;1988) and McGraw(1963) were popular for a long time. During the 1970s and 1980s, models from cognitive theories were popular, particularly information processing approaches involving cognitive concepts, such as attention, memory, processing capacity and feedback (Keogh and Sugden 1985; Hay 1979; Schmidt 1975). More recently, the focus of attention has moved away from these models toward those that are more dynamic and ecological in nature. Explanations have been offered by those who are promoting dynamic systems as the theoretical underpinnings for how young individuals perform, learn, and change in their motor behaviour (Thelen 1995; Turvey and Fitzpatrick 1993). A dynamic systems approach does not concentrate on the cognitive processes of the child nor does it invoke pure maturational concepts that gradually unfold with time. It examines the interaction between the demands made by internal constraints, such as body mechanics, and the external environmental requirements. It is a theoretical framework that specifically offers a set of principles for studying the emergence and evolution of new forms of movement and one that seeks to explain change (Clark and Phillips 1993).

It logically follows that differences in development that are observed, and in particular those differences that become profound and disabling, are also results of these internal and external constraints. The carry over from explanations of motor development using a dynamic systems approach to work with children showing impairments in motor development is in its infancy. However, it does appear to be particularly attractive for analysing the nature of the difficulties, the assessments in context and for developing principles for intervention into practice.

DISCUSSION

What emerges from this review of research evidence in the field of early childhood education curriculum models, the effects of their implementation and related models of assessment, is how little hard evidence we have to guide policy and practice. So, for example, the debates about the efficacy of subject led and developmentally appropriate practice led knowledge bases for the education of young children continue without a robust evidence base. Research into curriculum design, delivery and assessment in 'real world', educational contexts tends to be complex and 'messy'. Controlled experimental studies of short and long term gains from distinct curriculum models in mainstream educational settings are unlikely to be funded for ethical and political reasons. However there are distinct and principled versions of curricula in, for example, Montessori and Steiner schools where families have made choices about the kind of educational experiences they want for their young children. Distinctive curriculum models have emerged in some of the well-established Centres of Excellence in England such as the Thomas Coram, Pen Green and Hillfields Centres. There are also differences in the curriculum models in mainstream settings in Northern Ireland, Scotland and England and Wales. It may be both practically and ethically possible to set up longitudinal, comparative studies of the impact of these naturally occurring differences in curricula and educational experiences. The research could explore short and long term educational gains over broad aspects of their achievements in matched samples of children. As we have indicated earlier, we need research evidence of the impact or cost effectiveness of different versions of assessment on children's educational progress and achievements.

Finally, funded research into young children's development of subject knowledge and skills has concentrated on the high status subjects of English, Mathematics and more recently Science. There are gaps in research evidence of how young children develop understanding and capabilities in the arts, technology, the humanities and religious/spiritual/moral/emotional domains.

IV. ADULT ROLES, TRAINING AND PROFESSIONALISM

INTRODUCTION
There are three main aspects to this section of the review of research. Like the majority of the research reviewed in the two previous sections of the report, research concerning provision for children in the three to five age range, much of it having been conducted in group, rather than home, settings is reviewed. However, there are two other important strands to this section: information about research on adult roles, training and professionalism relating to the important phase of birth to three; and an examination of work on adult roles, training and professionalism in the area of inclusion as applied to special educational needs.

Principles, policy, and practice
There are a number of questions which research on this topic should be able to answer. One main question is: *what research is there relating to adult roles, training, and professionalism to outcomes for children's learning?*

This overarching question needs to be broken down into smaller researchable aspects:

- what are the settings
- who are the workforce
- what effect do different adult roles have on children's learning
- what are educators' theories of pedagogy and how might they impact on children's learning
- what is known about the impact of continuing professional development (CPD) on outcomes for children
- what do we know about how children learn in relation to the training of adults?

Although the first two are descriptive questions, they are not as simple as they might seem, and the information is not readily available. For example, considering the first question, *'What are the settings?'* we find the following.

WHAT ARE THE SETTINGS?
There is no single national database identifying the nature of early years settings. Some of the difficulty in establishing baseline information is that there are a variety of terms for a variety of settings but the name does not provide much information about the nature of the setting (Blenkin and Kelly 1997, Moss 1998). However recent policy changes, such as the setting up of Early Years Development and Childcare Partnerships (EYDCPs)[i] and the establishment of annual childcare audits[ii] have led to attempts to gain an overview of provision in the UK.

WHO ARE THE WORKFORCE?
There are a variety of occupational names given to those working with children. These occupational names are not informative as to the initial training and qualifications of the workers. What we do know however is that workers with young children in the UK are overwhelmingly female (Moss and Penn 1996), although it is only recently that research has begun to explore the implications of this. Penn and McQuail (1997) interviewed and explored the attitudes of a small sample of nursery nurse trainees and their lecturers. Cameron et al (1999) have investigated *Men in Nurseries*.

The QCA (1999b) [iii] has recently attempted a classification of occupational roles into an occupational hierarchy, in order to decide what qualification and qualification level would be required for these different workers to be registered within the new Framework of Accredited Qualifications.

In addition, the relatively newly established Early Years National Training Organisation (EYNTO), recently commissioned a series of surveys of the early years workforce (EYNTO et al 1999; 1999a; 1999b; 1999c; 2000; 2000a). These include surveys of independent day nurseries, childminders, preschools/playgroups, education support staff, agency nannies, and out of school clubs in England. The surveys have collected [iv]data on numbers of staff, their characteristics, recruitment and retention, qualifications and training. These should provide us with better and more comprehensive information on early years practitioners, and may help us produce a better classification of occupational roles. Members of the EYNTO are for example collecting information on ethnicity which indicates that the workforce is overwhelmingly white except perhaps for childminders in London where 8% identify themselves as black in the childminders workforce survey (EYNTO 1999).

Such information is not available for early years teacher qualifications. As late as 2001, the DfEE's report on 'Teacher Resignations and Recruitment', the annual survey of teacher resignations and recruitment that covers LEA schools, Grant Maintained schools and sixth form colleges in England and Wales, a definitive source of data on turnover and recruitment of teachers in general, still did not include specific data on Early Years teachers.

Qualification opportunities in Early Years and Special Educational Needs have not been available historically although a number of institutions are now offering these, specifically at Post Graduate level e.g. University of Northumbria.

A research project, *Principles into Practice* (PiP), was one of the first to provide extensive information into practitioner qualifications (Blenkin and Yue 1994; 1994a; Blenkin and Kelly 1997) from a national survey of those working with children from birth to eight and this included information on nursery teachers. Of these qualified teachers, who could be regarded as among the most highly qualified practitioners in the sector, only a quarter were initially trained for the 3-8 phase, and only a third of this group were initially trained to work with 3-5 year olds. In addition a significant number of the qualified teachers were initially trained to work in secondary schools (Blenkin *et al* 1996 :10).

WHAT EFFECT DO DIFFERENT ADULT ROLES HAVE ON CHILDREN'S LEARNING?

Focusing on children from birth to three

When we think about adult roles, professionalism and training in relation to early years services (rather than more specifically early years education), and particularly in relation to the earliest years, from birth to three, the obvious question that has dominated public debate is whether, particularly in the first twelve months, it matters *which* adults, (parents or professional carers), look after and interact with children.

Much of the public debate and research concerning early years services for children under three, has been in the context of attachment theory and its central tenet of the development, in human infants, of an attachment relationship to a small number of specific adults. The purpose of this attachment relationship is not just for protection and nurture but to facilitate feelings of security and comfort. In this context, the primary concern of research and debate has been over the question of whether non parental care might disrupt the development of the attachment process, leading to both immediate difficulties (distress and anxiety for children) and later difficulties (inability to form stable and close relationships). If attachment theory is accepted as a model of human relationships, formed across the life cycle, in which first relationships (internal working models) act as a template for subsequent relationships, it has critical significance in policy and practice for early years services.

From the point of view of day care for parents in employment, the length of their combined working and travelling day and the impact on their child of separation for this duration is one key issue. From the point of view of early learning, the impact of separation, feelings of anxiety and their impact on the child's capacity to play, explore and discover is a second key issue.

However, many researchers would be highly cautious about the policy and practice implications of attachment theory because of its original emphasis on exclusive maternal care. Judy Dunn's work (for example, 1988; 1993; 1999) has emphasised the importance of children's relationships (both with adults and peers) beyond attachment relationships and has explored the link between these wider relationships and social emotional and cognitive outcomes.

On the basis of the above**,** it seems important to search for evidence concerning the following specific questions with relation to adult roles, professionalism and training:

- how important is it which adults look after children in the first three years (i.e. is non parental care harmful)
- what kinds of roles and behaviours by adults facilitate optimum learning (how important for example is attachment security -absence of anxiety - in order for children to be effective learners, and
- what is known about the most effective forms of training / professional development to enable adults to carry out these roles?

We will consider the research evidence informing each of these questions in turn.

How important is it which adults look after children in the first three years (i.e. is non parental care harmful)?

Mooney and Munton, with the election of the new Labour Government, conducted a review (1997) of the current position concerning early childhood services. They draw on three further reviews, McGurk et al (1993); Rutter (1995) and Lamb (1996) to conclude that non-maternal care before the age of one does not put mother–infant attachment at risk.

A particularly important study in relation to the impact of early childhood services on infant–mother attachment is the American NICHD study (National Institute of Child Health and Human Development Early Child Care Research Network 1997). It shifts the dichotomy of home *or* day care – 'which is best?' - to focus on the importance of the interaction between the two. There is a key message here in terms of adult roles and the qualities of sensitivity and responsiveness, indicating that there is a consistent pattern supporting the proposition that children's attachment is affected by a combination of maternal and child care factors. Those children who received less sensitive and responsive caregiving in childcare as well as less sensitive and responsive care from their mothers were the least secure.

What kinds of adult roles and behaviours facilitate optimum learning?

Mooney and Munton (1997) conclude that consistency, sensitivity and responsiveness are the key elements associated with good quality (social – emotional and cognitive) outcomes.

A key study concerned with consistency and learning is that of Munn and Schaffer (1993), who found that children (aged 2 and 3) in nurseries with smaller groups, younger staff and more effectively implemented child assignment systems, were more

frequently observed involved in activities involving numeracy and literacy, and their interactions with the adults centred on these activities tended to be generally positive rather than negative.

This is particularly important as it highlights the importance of the keyperson approach which is referred to in the draft National Standards published by the DfEE (2000a).

Rutter (1995) also refers to the importance of consistency although the link to learning is only implied and not explicit. He suggests that children cope well with having several adults look after them as long as it is the same adults over time. Further, children need those people with whom they have a secure attachment relationshipto be available at times when they are tired, distressed or facing challenging circumstances.

The link between attachment and learning is made explicit in the study by Howes and Hamilton (1993) and Howes et al (1994). Mooney and Munton's (1997) review of the research draws on these studies, concluding that secure relationships between caregivers and children can be an important influence on children's behaviour, promoting more advanced types of play and better peer relationships, for example.

Finally Colwyn Trevarthen's (1995) work on the development of babies is relevant to thinking about adult roles and learning. He argues that from their very earliest days, babies are highly motivated to learn. Their learning is profoundly influenced by the interplay or 'proto-conversations' between themselves and their parents and carers. According to Trevarthen, language acquisition and, as a result, thinking and understanding is supported by this relationship with its demands co-operation and negotiation.

What is known about the most effective forms of training / professional development to enable adults to carry out these roles?

There are two papers relevant to answering this question, (Hopkins 1988; Munton et al 1996).

Hopkins' (1988) documents work with a group of early years practitioners over a period of six months. The members of the group were invited to discuss their feelings and professional views about relationships with very young children. The paper describes how, encouraged by a growing experience of security and trust within the group, members shifted expressed views from very detached and impersonal descriptions of interactions with children through to increased acceptance of the importance of individual attachments. Group members reported that as their own importance to individual children became more acknowledged and accepted within the group, their work enjoyment and satisfaction increased too and staff absenteeism dropped.

Munton et al's (1996) paper reviews the school effectiveness and adult education literature to draw out the elements of effective staff development interventions with nursery staff. On the basis of an analysis of Kolb's (1984) model of experiential learning, it argues for a model of structured experiential learning exercises for nursery nurses. It concludes by identifying the characteristics of training interventions for effective professional development.

Young children with special educational needs

Identification of need for training/professional development

Currently (from 1997 onwards) the DfEE is placing significant emphasis on training and development for all those working with children with SEN and particularly across the Early Years Development and Childcare Partnerships EYDCPs. This training for EYDCPs has been particularly focused on Special Educational Needs Co-ordinators (SENCOs) who will support settings from LEA funded nurseries to childminders at home. To date the nature and extent of training remains undefined and research studies supporting this development are not cited.

Whilst there is no national audit of teachers' perceived needs nor specific research into what types of professional development may have a direct impact on the achievement of pupils in the classroom, the Teacher Training Authority's *National Standards for Special Educational Needs Coordinators* (TTA 1998) offer a personal audit tool for staff to: -

> 'help teachers and headteachers identify specific training and development needs in relation to the effective teaching of pupils with severe and/or complex SEN' (TTA 1998: 1).

In his study of welfare assistants Clayton (1990) concludes that it would have been a distinct advantage for many of those involved in his study to have substantial pre-employment training. The scope scale and content of such training is not addressed.

The literature generally calls for more training for both professionalised and non-professionalised adults who work within this area. However, research studies that address issues such as the purposes and focus of such training have not been identified.

The content of professional development for those working with children with SEN

The NSENSS list what it considers to be the universal knowledge and set of skills that teachers working in the field should hold. A framework for conceptualising the nature of specialist teaching, or more particularly, specialist teaching within the early years, is absent and specific references to research source material are not identified. This is equally true in the report by SENTC (Special Educational Needs Training Consortium 1996), *Professional Development to Meet Special Educational Needs*, which informed these Standards.

Training materials produced by the National Portage Association specifically address the training needs of those who work with *preschool* children in non-school settings. Whilst they have drawn on research from areas other than SEN (eg social disadvantage) and authors from other countries (eg Weikart 1993 in the US) there appears to have been no systematic study looking at the content of professional development for professionals in this particular area of SEN pedagogy in the UK.

The work of Lewis and Norwich (2000) 'Mapping and pedagogy for special educational needs', is useful in teasing out the concept of 'continua of teaching approaches' for children with SEN.

Ainscow (2000), utilising his research in the area of inclusive practice, suggests the professional development of teachers working with children with SEN should include 'a commitment to collaborative problem solving' as an important component.

However, in neither account (Lewis and Norwich or Ainscow) is the early years sector identified as a discreet arena.

Young children with SEN: questions for debate
Within the prevailing literature there appear to be three main debates that are contingent upon this arena.

- what constitutes a special educational need?
- what constitutes a Special Educational Needs (SEN) specialist ?
- do the Under 5s (6s) constitute a distinct and different grouping or are they seen as being part of a continuum from birth to adulthood (ie. are they included in the notion of lifelong learning)?

SEN Issues that need to be addressed

- To what extent are early years settings inclusive?
- How important is it for adults who work within early years settings to have specific training to work with children with SEN?
- Is there any evidence to suggest that any one form of training/professional development enables adults to engage more successfully with young children with special educational needs?
- Should a distinction be made in training needs across the education /care /home boundaries?
- Are there different training implications for professionalised and non-professionalised adults working in this multidisciplinary arena?
- Is the balance within training between knowledge and understanding on the one hand and skills on the other, as conceptualised by Porter and Miller (2000), helpful when considering specialist training?

Children aged 3-7 years
What effect do different adult roles have on children's learning?
We have almost no research that answers this question. The DES-funded project carried out in the 1970s reported in Hutt et al (1989) suggested that nursery nurses who worked alongside teachers used strategies aimed at developing children's cognitive abilities in ways that those working without qualified teachers in their team did not.

Some research studies have considered whether workers who work together in the same settings and who may have different occupational titles do work with children in the same or different ways and the presumption is that different ways of working may have different effects on children's learning but this is not usually directly measured.

For example, Moyles and Suschitzky (1994; 1997; 1997a; 1998; 1998a) reported on the different perceptions of their roles that differentially trained groups of practitioners have, in the context of working together in *education* settings - primary schools, nursery schools, nursery classes and reception classes. They explored practitioners' perceptions of their own roles and that of their classroom partners, and the relationship between their roles and children's learning experiences. In two concurrent projects, they compared the roles and skills and perceptions of (KSI teachers, classroom assistants (CAs), and specialist teaching assistants (STAs); and those of nursery nurses and nursery teachers and concluded that although the CAs, STAs and nursery nurses often regarded themselves as doing the same job as the teacher, observation and interview data indicated that this was not so, and that teachers, for example took a much greater responsibility for planning and management (ibid 1997; 1997a; 1998)

Other recent research in school settings, has explored differences in adult roles, including those of parents and teachers, in terms of processes, in this case styles of talk, in relation to children's learning (Hughes and Westgate 1998).

Somewhat similar research to Moyles and Suschitzky's has recently been carried out in Scotland, but across sectors that included more than specifically statutory educational settings. Again, although the study looked at how workers perceived

their roles in relation to conditions for learning, there was no direct measurement of the effects on children of the perceived differences. The study, commissioned by the Scottish Office (SOEID), used observation and interview approaches to explore the perceived roles, expectations and continuing professional development (CPD) needs of staff from different training backgrounds working in *preschool* provision in the voluntary, private and local authority sectors (Stephen et al, 1999). The researchers identified differences of emphasis among three different groups of practitioners which were

(1) that teachers emphasised conditions for learning,
(2) play leaders were more concerned with children's social skills, being concerned with 'disruptive behaviour and the importance of children being willing to engage in activities' and
(3) nursery nurses placed greater emphasis on the development and practice of life skills but less emphasis on social skills. (Stephen et al 1999: 50).

However, because the studies did not explore effects on children, we do not know if these perceived and observed differences in role and expectations have a measurable effect on children's learning.

WHAT ARE EDUCATORS' THEORIES OF PEDAGOGY AND HOW MIGHT THEY IMPACT ON CHILDREN'S LEARNING?

Practitioners' pedagogical frameworks have often been explored in terms of differences in their understandings of 'play'. Theoretical disagreements over the role of play, are discussed by Kontos (1999) in the context of *preschool* practitioners' roles and talk in relation to children's play in the USA. She cites Bredekamp and Rosegrant (1992) who distinguish between the 'early childhood error' where educators believe in 'standing back' when children play, compared with those who take a 'scaffolding', Vygotskian approach, and opposed to those who make the 'elementary error' of focusing exclusively on curriculum content.

Similar distinctions have been made in Britain. Researchers interested in practitioners' theoretical understandings have carried out some small-scale research, particularly in school settings. For example, Wood and Bennett (1997) reported a small scale qualitative study investigating teachers' theories of play and learning, and showed how, during the study, initial Piagetian, non interventionist views had been transformed into more social constructivist, Vygotskian approaches.

Hartley's (1993) sociological study of three nursery schools in the UK demonstrated that adults' assumptions about young children and their places in society shape their practice. Similarly, a small scale, funded, cross-cultural study carried out in Australia, France, England, and Singapore by teams from England and Australia (David et al 2000), explored the understandings and practices of early childhood professionals in group settings in relation to children's early literacy learning and they found that practitioners' approaches reflected dominant national beliefs about the role of the preschool. They also found that practitioners in England, despite avowing their allegiance to play approaches to children's learning, resorted to didactic, teacher-led instruction due to their belief that this would fulfil the expectations of inspectors and because they lacked the necessary knowledge about early literacy (see section II). Further, using Rosenthal's (2000) analysis of how different societies enculture very young children, they suggest from their research findings in the four countries that adult understandings of their own and children's roles in the teaching and learning process, their theories of pedagogy, reflect the extent to which a society is individualist or collectivist in ethos (David et al 2001).

A new small scale funded project '*Too Busy to Play'*, which has been developed in England from Moyles's earlier work, is also currently investigating teachers knowledge, understanding, and values in relation to children's play. From the theoretical perspective of grounded theory the study is looking in depth at seven practitioners' (5 teachers, two nursery nurses) understandings of play (Moyles and Adams, 2000). The authors report

> ' the extent of the process of deconstruction and the required rebuilding of confidences and skills was largely a 'tale of the unexpected'. Similarly, we did not anticipate the deeply-and sometimes desperately-felt need of all the practitioners for support in understanding underpinning theories of children's cognitive processes, particularly given the experiences and maturity of the participants' (Moyles and Adams, 2000:364)

Thus these studies begin to describe differences and perceived gaps in educators' theories of pedagogy but once again we do not have evidence as to the second half of the question: *how do such differences impact on children's learning*? One small scale study from the US (Schweinhart et al, 1986) looked at the effect of three different curricula, High Scope, Distar and one modelled on the US 'nursery school tradition', in a longitudinal follow up of early childhood provision. This identified the effects on children, who had been randomly assigned to these preschool curricula and then assessed on a number of measures at the age of 15. The main differences were that those who had experienced the Distar model were more likely to commit delinquent acts during secondary school than those who had experienced the other two models. Further follow-up studies of the same cohort suggest that the effects continue in the same vein, including evidence of the lower incidence of psychiatric problems among the High/Scope 'graduates' (Schweinhart and Weikart 1993).

WHAT IS KNOWN ABOUT THE IMPACT OF CONTINUING PROFESSIONAL DEVELOPMENT ON OUTCOMES FOR CHILDREN?

Studies on practitioners' pedagogical understandings have often been developed into studies of continuing professional development. Several researchers have asked practitioners to identify their current practice as the first step of action research projects which seek to have them reflect critically on their own practice, in order to develop and improve it.

On this basis, the second phase of the *Principles into Practice* project (Blenkin and Kelly 1997) was developed as action research case studies, with the aim of developing practice. Similarly Moyles and Adams (2000; 2001) conceived the *Too Busy to Play* project to be one of action research and continuing professional development, aimed at developing practitioners' practice through their better articulation of it. Similarly, Stephen et al (1999) in the second stage of their project were concerned with the production of guidelines for 'quality' as an aspect of staff development.

The *Effective Early Learning* (EEL) project (Pascal and Bertram 1997) is a major project with national relevance that aims to improve practice and theoretical understanding of early childhood education. It started in 1993 following the publication of the *Start Right* report (Ball 1994) and is still continuing. The work has focused on evaluating and developing the quality of early learning in a diverse range of education and care settings for three and four year olds in the United Kingdom. The project supports practitioners in rigorously and systematically self-evaluating their practice. The project has had a significant impact on the quality of provision in early childhood settings throughout the UK and abroad. The EEL project identifies, within its conceptual framework, effectiveness in early childhood settings through three domains: context variables, process variables and outcome variables. So far the research has focussed on the first two domains, the setting context, delineated as 'ten dimensions of quality' (Pascal et al 1996) and the interactive processes, identified and measured by using two key observation instruments - Child Involvement (Laevers 1994) and Adult Engagement (Bertram 1996).

Thus the underlying assumption, of this and the previously mentioned studies, was that a form of in-service training, based on self assessment and reflection and with the aid of specially developed measures for better child observation and adult observation, would lead to better practice and by implication to increases in children's learning. Initially it was considered that measurement of child outcomes, which could include 'academic achievements, emotional well being, respect for self and others and educative dispositions', was conceptually complex and difficult to measure directly, so that the earlier phases of the research concentrated on improving practice. But there is now the intention of focusing on outcomes variables in a major research project – *Accounting Early for Life Long Learning* (the ACE project, Bertram and Pascal 1999).

With the recent government interest in the development of literacy and numeracy in young children, a sub sample from the EEL project, (118 children in ten settings in a large authority in the West Midlands) is being investigated further in a longitudinal project to see whether the children's scores when reaching primary school on literacy measures are related to high scores on the Child Involvement scale (Pascal et al 1998). A preliminary report (1998) has shown that in 50 per cent of cases a linear relationship was found between Baseline Assessment in English and Mathematics (BAEM) at 4 and Standard Assessment Tasks (SAT) in English and Maths at 7.

Anning and Edwards (1999) also report a relevant recent project. Although the main aim of their project was

> 'to bring together expertise from key practitioner researchers from a range of types of preschool and daycare setting with university based researchers, to develop and articulate a curriculum model for effective education in literacy and mathematics for very young children.' (Anning and Edwards 1999:3)

They were also interested in the way that action research could enhance the professional development of educarers. Their research involved 20 preschool practitioners, from three local authorities, four local authority senior managers, together with the authors and a range of different settings with children aged from between birth and 60 months. They used interviews, questionnaires and other data to explore practitioners' developing evaluations of their own practice.

National evaluation of the Early Excellence Centres' (EECs) Pilot Programme is currently being undertaken by Pascal el al (2001) and Bertram and Pascal (2001). Among other aims set by government there is a focus on demonstrating effectiveness and value for money. There is no explicit requirement to examine staff roles, qualifications and training in relation to child outcomes. Only the most recent research has tried to directly measure outcomes in relation to continuing professional development. Thus we still need to ask the question that follows.

WHAT DO WE KNOW ABOUT HOW CHILDREN LEARN IN RELATION TO THE TRAINING OF ADULTS?

In answering this question we need to distinguish between initial training and education, and qualifications; and continuing professional development and/or in-service training.

Although we have just considered this question in relation to in-service training and continuing professional development, there is very little existing research that directly links initial training and qualifications with child outcomes.

In the limited research that does exist reviewed by Sylva and Wiltshire (1993), different early childhood settings with 3 to 5 year old children, have been linked with different child outcomes, (different types of setting, on the whole, having staff with different training and qualifications) (Shorrocks et al 1992; Jowett and Sylva 1986). The measured outcomes were cognitive. They indicated that children who have been in nursery school settings, and thus with staff with graduate qualifications, have better scores on reading or mathematics tests once they are at school, compared with children who have been in other settings without such graduate qualified staff.

One US research project (Howes 1997) did look directly at issues of training and children's learning. The study covered childcare settings that included children under and over three and compared staff with different educational and initial training backgrounds in relation to measured child outcomes. They explored the relationship between teacher background and adult:child ratio in centre-based childcare by examining two representative samples on the following measures: Cost, Quality, and Outcome (N=655 classrooms and 760 children; and in the Florida Quality Improvement Study N= 410 classrooms and 820 children). Their findings suggested that different initial training was reflected in different child outcomes, and supported the view that graduate qualifications are important. They found for example, that staff with university degrees in early childhood education were more likely, compared with others with lower qualifications, to be both more sensitive and responsive to the children in their care. Children in classrooms where their teachers had such qualifications, rather than other, lower, qualifications, (such as associate of arts degrees and CDA certificates, or with some further or high school qualifications plus workshops,) were also more likely to play in a more complex way, with both objects and with other children. Complexity was measured by observations using two scales, one relating to play with objects (like toys) and one to play with other children.

The current longitudinal study, *The Effective Provision of Pre- School Education [EPPE] Project* funded by the DfEE, (Sylva et al 1999), also cited in the two previous sections, should soon be able to provide evidence relating staff qualifications to a number of child outcomes. Technical paper 5 from this project reports on the first stage of the research, which began in 1997, and provides information, based on interviews with heads of centres, as to the highest educational and childcare qualifications of their staff. Qualitative and quantitative methods are being used to explore the effects on children of different types of *preschool* provision, the characteristic (interaction) styles, staff training of more effective *preschool* centres, and the interaction between child, family characteristics and particular forms of *preschool* provision. An educational effectiveness research design was chosen to enable the investigation of the progress and development of individual children and the effect of individual *preschool* centres on children's outcomes at entry to school and the end of Key Stage 1.

Preliminary findings (Sammons et al 2000) already suggest that nursery schools, classes, and combined centres, compared with other settings, are more likely to score highly on measures of nursery quality. That is, the children from these settings achieved better scores on both the cognitive and communicative sections of an early childhood environment rating scale. These same settings had staff who had been shown to relate both more sensitively to the children and to provide better support for the children's cognitive development.

CONCLUSIONS

The culmination of this research review leads us to point out the paucity of evidence about the relation between adult training, professionalism and children's learning. We are still trying to describe the field in its complexities. At the same time there are attempts, sometimes based on action research, to improve the practice of those in the field but we are far from linking these efforts with measuring the effects of any changes on children. Much practitioner research, which could contribute to the knowledge base, is under-reported. Choices about policy and practice are often made on grounds other than research evidence. If we want to make changes which we hope will be improvements, we do not always want to wait for the confirmation of research results, since these may well take many years to gather, analyse and interpret, before changes could be initiated on that basis. For example Sylva et al's current research may give us answers but unfortunately by then the field may have changed drastically with new education, training, and qualifications coming on stream as well as the provision itself changing. People may well then have greater experience with more centres having a greater integration of care and education and with more provision directed at the youngest children (eg Sure Start). It is important to find ways to assess these changes as they happen. A national Sure Start evaluation is being carried out, led by Birkbeck College University of London (Belsky and Melhuish 2001) is being carried out, as well as that of the Early Excellence Centres (Betram and Pascal 2000; 2001) but such evaluation is under-funded, complex and time consuming. They often flounder when statistical outcomes alone are valued, when what is needed is both quantitative and qualitative approaches. Further, the research questions such evaluations should ask are frequently disputed.

V. CONCLUSIONS AND FUTURE RESEARCH

Drawing on the evidence presented in the earlier sections of the review, some of the most important overall conclusions are those concerned with the range and types of research evidence about pedagogy, curriculum and assessment, and adult roles, training and professionalism available to date. We note, for example:-

- that existing research has either not asked the questions to which we now seek answers, or that there have been gaps in the past research
- that contexts change over time and so past research cannot necessarily answer current questions
- that care must be exercised when drawing on research from other disciplines (such as neurophysiology).

Further, one very important aspect of early childhood education and care related to using play as '**the** vehicle for learning' has been examined and the research would suggest that while play does appear to provide children with opportunities to learn, the evidence for the educational effectiveness of play is limited, but this may be due to the fact there is also evidence that teaching through play is misunderstood by and/or problematic for many practitioners.

Nevertheless, we can still draw some helpful conclusions relating to pedagogy; curriculum and assessment; and adult roles, training and professionalism from the review. These include:-

- learning changes the structure of the young brain
- learning organises and re-organises children's brains
- different parts of the human brain may be 'ready' to learn at different times
- brain growth and development is influenced positively by positive emotional support, secure early attachments, stimulation of all the senses, novel challenges, encouraging social interaction, language rich settings, and active learning styles. It is also influenced negatively by stressful and impoverished environments. However, the brain, even in adulthood, is impressive in its plasticity, so 'critical periods' are not an issue for human learning
- babies are learning right from the start
- some human learning is implicit
- the most effective ECEC settings plan a curriculum that is taught informally in ways appropriate to a child's previous learning, experience and interests, with a mix of child-directed and adult-directed activities
- attendance at a preschool setting is positively associated with test scores on entry to school, regardless of gender, ethnicity, age or socio-economic status
- for teachers of KS1, the introduction of the National Curriculum, and Literacy and Numeracy strategies have caused a major shift in approaches to planning, and curriculum activities are more tightly structured, with more time devoted to assessment
- KS1 teachers are generally positive about the need for early assessment but they are less secure about how to apply insights to teaching/ learning activities
- young children are active agents in their own learning. They learn best in appropriately resourced environments where they are supported by receptive and psychologically available adults, who are knowledgeable about how children learn
- learning which encompasses children's home environment and experiences, as well as involving personally significant adults is the most effective
- for children under three, consistency, secure relationships with key workers, and links between nursery and home are significant features of effective practice
- Year R teachers need to be more aware of and build on the existing knowledge that children have acquired before school entry
- a mis-match can occur when there are cultural differences between home learning patterns and those of school or preschool
- adults mediate children's engagements with mathematics and preschools generally offer more mathematical experiences than do home environments, although both vary in the frequency and recognition of mathematical opportunities. Further, adults often underestimate young children's mathematical and scientific abilities and knowledge
- learning for both young children and the adults who are their educators needs to be based on real-life, shared experiences
- there is a need for more and better training for educators in creating the conditions for learning through play and in the use of collaborative play and peer talk approaches, and in scaffolding children's learning
- choices about policy and practice are often made on evidence other than that from research.

As was stated in the introduction, it is not claimed that this review of research on provision for young children is comprehensive. Many areas of children's lives and learning have been omitted. It does not include work on certain aspects of the curriculum, for example, History and Geography, which together with Science and ICT form the basis of 'Knowledge and Understanding of the World'. Nor has the review explored the evidence about young children's spirituality. Additionally, while the group endorses the idea of parents as a child's primary educator, evidence on home-setting/ school links or parents' roles in their children's learning have only been touched upon. Similarly, young children's learning in home settings is barely represented but it has been little researched. Notable exceptions include Tizard and Hughes (1984), Davie et al (1984), and research about home-school cultures and starting school (such as Jackson 1979) and studies of home influences on early

reading (such as Minns 1997 and Weinberger 1996). Studies of how young children spend their day, whether at home (their own or a childminder's) or in an ECEC setting (especially those aged between birth and three) have been rare in recent years, where most studies have focused on a particular aspect of the curriculum, as defined by Government bodies. Since life in the new millennium is very different compared with the early 1980s that new studies using the same and different approaches would add to our current information base. Work for the DfES *Birth to Three Matters* Project (David et al in press) revealed the limited number of research studies in Britain which have focused on very young children (aged from birth to three years) in either their home or ECEC settings and this is therefore an area in great need of both quantitative and qualitative exploration.

Clearly there could be many further reviews of Early Childhood Education research. The OECD (2001) provides some pointers to the kinds of data which are required from an international perspective and most of their comments would apply to the UK at national level. Further, the OECD report's authors comment that this field should draw on a wider range of disciplines, arguing that developmental psychology has provided much of value but that contributions from anthropology, sociology, public policy and learning theory research would strengthen this knowledge base.

The main recommendations concerning future ECEC research

The review indicates the need for further research concerning the following aspects of Early Childhood Education and Care:-

- the arts and creativity in young children, since musicality and meaning-making seem to be central to learning in the earliest years
- young children's physical development other than that in the medical field also requires much more exploration. Ecological models linking children's physical growth and development with environmental and other constraints and opportunities are gaining ground and this exciting development provides scope for much further work
- young children's identity development - Connolly's (1998) research concerning gender and 'race' has begun this process but the concept of such young children as citizens and young children's rights as human beings have been largely neglected
- pedagogy in nursery and KS1, in particular about pedagogy related to ECEC for children aged between birth and three years of age
- policy research.

The review of research concerning the development of children between birth and three years revealed the paucity of evidence from the ECEC field about the this age group, thus this too could be added to the list of proposed foci for the future (David et al in press). In addition, both reviews point to the need for researchers, policy makers and practitioners to work together to define questions and useful forms of inquiry in continual cycles of coordination and improvement. In particular, two related areas of work for early years researchers stand out as being essential. The first is to publicise and explain research findings to a wider audience, including parents as well as practitioners and policy makers. The second is to recognise and debate fully the ways in which our beliefs, values and current contexts influence not only our research approaches and philosophy, but also the theories to which we subscribe and those we develop and the resultant effects on young children.

REFERENCES

Abbott, J. (1999) Battery Hens, or Free Range Chickens: What Kind of Education for What Kind of World? Paper presented at the *North of England Education Conference*, University of Sunderland, 7 January, 1999.

Abbott, L. and Nutbrown, C. (eds) (2001) *Experiencing Reggio Emilia. Implications for Preschool Prevision.* Buckingham: Open University Press

Ainscow, M. (2000) The next step for special education: Supporting the development of inclusive practices. *British Journal of Special Education* 27 (2): 76-80

Alexander, A. (1999) Culture in pedagogy, pedagogy across cultures. In R. Alexander, P. Broadfoot and D. Phillips (Eds.) *Learning from Comparing: New directions in comparative educational research. Vol. 1. Contexts, Classrooms and Outcomes.* Oxford Symposium Books, 149-180.

Alexander, P. (2000) Towards a model of academic development: Schooling and the acquisition of knowledge. *Educational Researcher,* March, 28-44.

Alexander, R., Willcocks, J. and Nelson, N. (1995) Discourse, pedagogy and the National Curriculum: change and continuity in primary schools. *Research Papers in Education,* 11 (1): 81-120.

Anning, A and Edwards, A (1999) *Promoting children's Learning from Birth to Five: developing the new early years professional* Buckingham: Open University Press

Anning, A (2000) *The Influence of the Socio-cultural context on Young Children's Meaning Making through Mark Making, Drawing, Modelling and Playing with Objects.* Working Paper 2.2 Leeds: The Centre for Research Family, Kinship and Childhood, University of Leeds

Anning, A. (1997*) The First Years at School*, Buckingham, Open University Press

Anning, A. and Edwards, A. (1999) *Promoting Children's Learning from Birth to Five. Developing the new early years professional.* Buckingham: Open University Press.

Arnot, M, David, M. and Weiner, G. (1996) *Educational Reforms and Gender Equality in Schools*. Manchester: Equal Opportunities Commission.

Athey, C. (1990) *Extending Thought in Young Children* London: Paul Chapman

Atkinson, D. (1991) 'How Children use Drawing' *Journal of Art and Design* Education, 10 (1): 57-72

Atkinson, D. (1993) 'Representation and Experience in Children's Drawing' *Journal of Art and Design Education*, 12(1): 85-104

Aubrey, C. (1995) Teacher and pupil interaction and the processes of mathematical instruction in four reception classes over children's first year at school. *British Educational Research Journal*, 21 (1): 31-47.

Aubrey, C. (1996) An investigation of teachers' mathematical subject knowledge and the processes of instruction in reception classes. *British Educational Research Journal*, 22 (2): 181-197.

Aubrey, C. (1997) *Mathematics Teaching in the Early Years. An Investigation of Teachers' Subject Knowledge.* London: Falmer Press.

Aubrey, C. (2001) Questioning comparative approaches: context and the role of international comparison in policy-making. In T.David (ed) *Advances in Applied Early Childhood Education Vol 1: Promoting Evidence-based Practice in Early Childhood Education* London: JAI 273-88

Aubrey, C. (2002) Multiple perspectives on growing up in an urban community. *European Early Childhood Education Research Journal,* 10 (2) (in press).

Aubrey, C., David, T., Godfrey, R. and Thompson, L. (2000) *Early Childhood Education Research: issues in methodology and ethics.* London: Falmer Press

Aubrey, Godfrey and Godfrey, (2000) Children's early numeracy experiences in the home. *Primary Practice*, 26: 36-42.

Ball, S. .J. (1998) Performativity and fragmentation in 'postmodern schooling'. In J. Carter (Ed.) *Postmodernity and the Fragmentation of Welfare.* London, Routledge.

Ball, S. J. (1994) *Education Reform. A Critical and Post-structural Approach.* Milton Keynes, Open University.

Ball, S. J. (1999) Labour, learning and the economy: a 'policy sociology' perspective. *Cambridge Journal of Education,* 29: 195-206.

Barrett, M. and Eames, K. (1996) Sequential developments in children's human figure drawing. *British Journal of Developmental Psychology*. 14 (2): 219-236

Bassey, M. (2000) *Draft notes on three different kinds of review*. Newark: BERA

Beal, C. Arnold, D. (1990) The effect of instructions on view-specificity in young children's drawing and picture selection. *British Journal of Developmental Psychology*. 8 (4): 393-400

Belsky, J and Melhuish, E. (2001) Further information on the national evaluation of sure start tender solicitation (www.psyc.bbk.ac.uk/announce/tender.html

Bennett, D. (1987) *The aims of teachers and parents for children in their first year at school in Four Year Olds in School: Policy and Practice*. NFER/SCDS Report. Windsor: NFER

Bennett, N. and Dunne, E. (1992) *Managing Classroom Groups*. London: Simon and Schuster.

Bennett, N. and Kell, J. (1989) *A Good Start? Four Year Olds in Infant Classes*_ Oxford: Blackwell.

Bennett, N. and Kell, J. (1989) *A Good Start: Four Year Olds in Infant Schools*. Oxford: Basil Blackwell

Bennett, N., Wood, E. and Rogers, S. (1997) *Teaching Through Play: Teachers' Thinking and Classroom Practice.* Buckingham: Open University Press.

Bereiter, C. (1991) Implications of connectionism for thinking about rules. *Educational Researcher* 20: 10-16.

Bereiter, C. and Scardamalia, M. (1996) Rethinking Learning. In D. R. Olson and N. Torrance (Eds.) *The Handbook of Education and Human Development: New Models of Learning, Teaching and Schooling* New York: Blackwell. 485-513.

Berns, G. S., Cohen, J. D. and Mintum, M. A. (1997) Brain regions responsive to novelty in the absence of awareness. *Science,* 276, 5316: 1272-5.

Bernstein, B. (1971) On the classification and framing of educational knowledge in M.F. D. Young (ed.) *Knowledge and Control.* London: Collier – Macmillan 47-69

Bernstein, B. (1996) *Pedagogy, Symbolic Control and Identity.* London: Taylor and Francis.

Bertram, A.D. (1996) Effective Early Educators: a methodology for assessment and development. Unpublished PhD thesis, University of Coventry

Bertram, A. D and Pascal, C. (1997) A Conceptual Framework for Evaluating Effectiveness in Early Childhood Settings. In M. Karlsson Lohmander (Ed) *Research in Early Childhood: Settings in Interaction.* Vol 3 Goteborg, Sweden: Early childhood research and development Centre, Goteborg University 125-150.

Bertram, A. and Pascal, C. (1999) Accounting early for Life Long Learning. In L.Abbott and H.Moylett (eds) *Shaping the Future: Early Education Reformed* London: Falmer Press 93-104

Bertram, A. and Pascal, C. (1999) *Early Excellence Centres. Developing high-quality integrated early years services. First Findings. Autumn, 1999.* London: DfEE.

Bertram, A. and Pascal, C. (2000) *Early Excellence Centre Pilot Programme. Annual Evaluation Report.* London, DfEE.

Bertram, A. and Pascal, C (2001) RB258 *Early Excellence Centre Pilot Programme: Annual Evaluation Report 2000*. Birmingham: Centre for Research in Early Childhood, The Thomas Centre

Bertram, T. and Pascal, C. (2001a) Assessing what matters in the early years. In J.Fisher (ed) *The Foundations of Learning* Buckingham: Open University Press 87-101

Bissex, G.L.(1980). *Gnys at Wrk*. Cambridge,Mass:Harvard University Press.

Black, P. (1996) Formative assessment and the improvement of learning. *British Journal of Special Education* 23 (2): 51 – 56

Blakemore, S. J. and Frith, U. (2000) *The implications of recent developments in neuroscience for research on teaching and learning*, ESRC-TLRP website http://www.ex.ac.uk/ESRC-TLRP

Blakemore, S.J. (2000) *Early Years Learning.* (Post Report 140) London: Parliamentary Office of Science and Technology.

Blatchford, P., and Cline, T. (1994). Baseline Assessment: Selecting A Method of Assessing Children on School Entry. *Education* 3 (13):10-15.

Blenkin G.M and Kelley, A. V (1997) *Principles into Practice in Early Childhood Education* London: Paul Chapman Publishing

Blenkin G.M and Kelley, V (2000) The concept of Infancy.- A Case for Reconstruction *Early Years* 20 (2): 30-38

Blenkin, G and Hutchin V (1998) Action Research, Child Observations and Professional Development: Some Evidence from a Research Study *Early Years* 19 (1): 62-75

Blenkin, G.M. and Yue N.Y.L. (1994a) Profiling early years practitioners: some first impressions from a national survey. *Early Years* 15(1): 13-22

Blenkin, G.M. and Yue N.Y.L. (1994b) *Principles into Practice: Improving the Quality of Children's Early Learning* (Year One: June 1993 –May 1994) Interim Report: March 1994, *ERIC database*, ERIC monthly abstract journals. Resources in Education (RIE), and Current Index to Journals in Education (CIJE)

Blenkin, G.M., Rose, J and Yue N.Y.L. (1996) Government Policies and Early Education Perspectives from Practitioners *European Early Childhood Research Journal* 3(2): 5-20

Blenkin, G.M.and Kelly, A.V. (1997) *Principles into Practice in Early Childhood Education*. London: Paul Chapman Publishing

Blenkin, G.M.and Kelly, A.V. (Eds.) (1994) *Early Childhood Education: A Developmental Curriculum*. London: Paul Chapman

Bottle, G. (1999) A study of children's mathematical experiences at home. *Early Years*, 20(1): 53-64.

Bransford, J. D., Brown, A. L. and Cocking, R. R. (2000) *How People Learning: Brain, mind, experience and school.* Washington, DC, National Academy Press.

Bredekamp, S. (1986) *Developmentally Appropriate Practice in Early Childhood Programs Service Children from Birth through Age 8*. Washington DC: National Association for the Education of Young Children

Bredekamp and Rosegrant (1992) *Reaching potentials: Appropriate curriculum and assessment for young children*. Washington, Dc: National Association for the Education of Young Children

Brierley, J. (1994) *Give me a child until he is seven: Brain Studies and Early Education.* 2nd Ed., London: The Falmer Press.

Broadhead, P. (1997) Promoting sociability and cooperation in nursery settings. *British Educational Research Journal*, 23: 513-531.

Broadhead, P. (2001) Investigating sociability and cooperation in four- and five-year -olds in reception Class Settings. *International Journal of Early Years Education*, 9 (1): 23-35.

Brooke, H. and Solomon, J. (1998) 'From Playing to Investigating: Research in an Interactive Science Centre for Primary Pupils'. *International Journal of Science Education* 20 (98): 959 –971

Brown, M., Askew, M., Baker, D., Denvir, H., and Millett, A. (1998) Is the National Numeracy Strategy research-based? *British Journal of Education Studies,* 46: 363-385.

Brown, M., Millett, A., Bibby, T. and Johnson, D. C. (2000) Turning our attention from the What to the How: the National Numeracy Strategy. *British Educational Research Journal.* 26 (4): 457-471.

Browne, N. and France, P. (1985) Only Cissies wear Dresses: a Look at Sexist Talk in the Nursery in G.Weiner (Ed) *Just a Bunch of Girls* Milton Keynes: Open University Press. 27-49

Bruce,T. (1987) *Early Childhood Education.* London: Hodder and Stoughton.

Bruer, J. T. (1997) Education and the Brain: A Bridge Too Far. *Educational Researcher*, 26 (8): 4-16.

Bryant, P.E. and Bradley, L. (1985) *Children's Reading Problems*. Oxford: Basil Blackwell.

Bryant, P.E., Bradley, L., Maclean, M. and Crossland, J. (1989/90) Nursery rhymes, phonological skills and reading. *Journal of Child Language* 16: 407-28.

Bryne, B. (1991) Experimental analysis of the child's discovery of the alphabetic principle. In L.Rieben, and C.A. Perfetti (Eds) *Learning to Read: Basic Research and its Implications*. Hillsdale,NJ: Erlbaum. 106-27.

Buck D. and Youngman M. (1996) An investigation of the relationship between reported results of educational psychologists' assessments and levels of special needs provision determined by statutory assessment procedures. *European Journal of Special Needs Education* 11 (3): 298-310

Buck, D. (1999) The Constructs used by Statement Panel Decision-Makers *Educational Psychology in Practice* 15 (2): 81-88

Butterworth, B. (1999) *The Mathematical Brain* London: Macmillan

Byrnes, J. P. and Fox, N.A. (1998) The educational relevance of research in cognitive neuroscience, *Educational Psychology Review* 10: 297-342

Cameron, C., Moss, P. and Owen, C. (1999) *Men in the Nursery: Gender and Caring work* London: Paul Chapman

Case, R. (1991) A developmental approach to remedial instruction. In A. McKeogh and J. L. Lupart (Eds.) *Towards the Practice of Theory-based Instruction* Hillsdale, NJ: Lawrence Erlbuam 114-147

Case, R. (1992) Neo-Piagetian theories of cognitive development. In R. J. Steinberg and C. A. Berg (Eds.) *Intellectual development*New York, Cambridge University Press. 161-196

Clark, J.E., and Phillips, S.J. (1993) A longitudinal study of intralimb coordination in the first year of independent walking: A dynamical systems analysis. *Child Development*, 64: 1143-1157.

Clark, M. (1976) *Young Fluent Readers*. London: Heinemann.

Clay, M.M. (1972). *Reading: The Patterning of Complex Behaviour*. London: Heinemann Educational Books.

Clay,M.M.(1966) *Emergent Reading* Behaviour.Unpublished doctoral dissertation, University of Auckland Library, New Zealand.

Clayton T. (1990) Welfare assistants: Are they equipped for their role? *Support for Learning* 5 (4): 193-8.

Cleave, S. and Brown, S. (1989) *Four Year Olds: Meeting their Needs*. Windsor: NFER/Nelson

Cleave, S. and Brown, S. (1991) *Early to School: Four Year Olds in Infant Classes.* Slough: NFER/Nelson.

Cleave, S. and Brown, S. (1991a) *Quality Matters*. Windsor: NFER/Nelson

Connolly, P. (1998) *Racism, Gender Identities and Young Children: Social Relations in a Multi-ethnic Inner City Primary School*. London: Routledge

Cox, M. and Chapman, L. (1995) The air-gap phenomenon in young children's pictures. *Educational Psychology*. 15 (3): 313-322.

Cox, M. and Mason, S. (1998) The young child's pictorial representation of the human figure. *International Journal of Early Years Education*. 6 (1): 31-38

Cox, M. and Lambon, R. (1996) Young children's ability to adapt their drawings to the human figure. *Educational Psychology*. 16(3): 245-255

Cox, T. and Saunders, S (1994) *The impact of the National Curriculum on the teaching of five-year-olds*. London: The Falmer Press

Croll, P. (Ed) (1996) *Teachers, Pupils and Primary Schooling.* London, Cassell.

Curtis, A. (1986) *A Curriculum for the Preschool Child*. Slough: NFER

Dahlberg, G. (2000) Keynote address. European Early Childhood Education Research Association Conference, University of London Institute of Education

Dahlberg, G and Asen, G (1994) Evaluation and regulation: a question of empowerment ,in P.Moss and A. Pence (eds) *Valuing Quality in Early Childhood Services* London: Paul Chapman 156-172

Dahlberg, G. Moss, P. and Pence, A (1999) *Beyond Quality in Early Childhood Education and Care. Postmodern Perspectives* London: Falmer Press

David, T., Raban, B., Ure, C., Goouch, K., Jago, M., Barrière, I., Lambirth, A. (2000) *Making Sense of Early Literacy: a practitioner's perspective* Stoke-on-Trent: Trentham Books

David, T., Goouch, K. and Jago, M. (2001) Cultural constructions of childhood and early literacy *Reading* 35 (2): 47-53

David, T., Goouch, K., Powell, S. and Abbott, L. (in press) Birth to Three Matters: Review of the Literature London: DfES Surestart Unit

Davie, C., Hutt, S.J., Vincent, E. and Mason, M. (1984) *The Young Child at Home*. Windsor: NFER-Nelson

Davies, B. (1989) *Frogs and Snails and Feminist Tales*. St Leonards NSW: Allen and Unwin

Davies, B. (1993) *Shards of Glass: Reading Writing and Beyond Gendered Abilities* St Leonards NSW: Allen and Unwin

Davies, C. V. (1992) Listen to my song: A study of songs invented by children aged 5 to 7 years. *British Journal of Music Education*, 9 (1): 19 – 48

Davies, J. and Brember, I. (1995) Attitudes to school and the curriculum in Year 2, Year 4 and Year 6. Paper presented at the *European Conference on Educational Research*, University of Bath

Davies, P. (2000) The relevance of systematic reviews of educational policy and practice. In the *Oxford Review of Education Special Issue on The Relevance of Educational Research* 26 (3 & 4): 379-91.

Denvir, H., Rhodes, V., Brown, M., Askew, M., Wiliam, D. and Ransom, E. (1999) Factors related to pupil gains in an assessment of numeracy in the first year of the Leverhume Numeracy Research Programme. Paper presented at the Annual Conference of the *British Educational Research Association*, University of Sussex

DfEE (2000) *Consultation Document SEN Code of Practice on the Identification and Assessment of Pupils with Special Educational Needs and SEN Thresholds: Good Practice Guidance on Identification and Provision for Pupils with Special Educational Needs*. London: DfEE.

DfEE (2000a*) National Standards for the Regulation of Day Care – Consultation Pack.* London: DfEE.

DfEE /School Curriculum and Assessment Authority (1996) *Desirable Outcomes for Children's Learning on Entering Compulsory School*. London:DfEE/SCAA

Department of Health (1991) *The Children Act 1989, Guidance and Regulations Volume 2, Family Support, Daycare and Educational Provision for Young Children* London:HMSO.

DES (1989) *Aspects of Primary Education: The Education of Children Under Five.* London: HMSO.

DES (1991) *Starting With Quality: Report of the Committee of Inquiry into the Quality of Educational Experience Offered to 3- and 4- year olds* (Rumbold Report) London: HMSO.

DfEE (1998) *Action Plan in Response to the Institute of Employment (IES) Report 'Excellence in Schools'.* London: DfEE.

DfEE (1999) *National Special Educational Needs Specialist Standards* London: TTA

Diamond, M.C. and Hopson, J. L. (1998) *Magic Trees of the Mind.* NY: Dutton.

Donovan, M. S., Bransford, J. D. and Pellegrino, J. W. (Eds.) (1999) *How People Learn. Bridging Research and Practice.*Washington, DC: National Academy Press.

Downing, J. (1979) *Reading and Reasoning*. Edinburgh: W.C. Books.

Dunn, J. (1988) *The Beginnings of Social Understanding* Oxford: Basil Blackwell

Dunn, J. (1993) *Young Children's Close Reltionships: Beyond Attachment*. Newbury Park California: Sage

Dunn, J. (1999) Mindreading and social relationships. In M.Bennett (ed) *Developmental Psychology: Achievements and Prospects* London: Taylor and Francis 51-71.

Durkin, K., Shire, B., Riem, R., Crowther, R. D. and Rutter, D. R. (1986) The social and linguistic context of early number word use. *British Journal of Developmental Psychology*, 4: 269-299.

Dweck, C. (1986) Motivational processes affecting learning. *American Psychologist*, 41: 1040-1048

Early Childhood Education Forum (1998) *Quality in Diversity in Early Learning.* London: National Children's Bureau Enterprises Ltd.

Early Years National Training Organisation with the Department for Education and Employment, and Improvement and Development Agency Preschool Learning Alliance(1999) *Registered Preschools and Playgroups Workforce Survey1998 England* London:EYNTO

Early Years National Training Organisation with the Department for Education and Employment, and Improvement and Development Agency (1999a) *Registered Out of School Clubs Workforce Survey 1998* . London:EYNTO

Early Years National Training Organisation with the National Day Nurseries Association, Department for Education and Employment, and Improvement and Development Agency (1999b) *Independent Day Nursery Workforce Survey 1998. England*. London:EYNTO

Early Years National Training Organisation with the National Day Nurseries Association, Department for Education and Employment, National Childminding Association and Improvement and Development Agency (1999c) *Registered Childminders Workforce Survey 1998 England* London:EYNTO

Early Years National Training Organisation with the Department for Education and Employment, Syniad (2000) *Agency Nannies: Training Survey 1999 Report* London:EYNTO

Early Years National Training Organisation with the Local Government National Training Organisation and the Department for Education and Employment (2000a) *Survey of Education Support Staff and Volunteers in Nursery and Primary Schools* London: Early Years National Training Organisation, the Local Government National Training Organisation and the Department for Education and Employment

Educational Psychologist (1992) *Educational Psychologist Special Edition: Brain and Education* 27 (4)

Edwards, C., Gandini, L. and Forman, G. (1998) *The Hundred Languages of Children: The Reggio Emilia Approach Advanced Reflections*. Norwood: N J. Ablex

Edwards, D. and Mercer, N. (1988) *Common Knowledge*. Milton Keynes: Open University Press.

Egan, K. (1988) *Primary Understanding: Education in Early Childhood* London: Routledge

Ehri,L.C.(1992) Reconceptualising the Development of Sight Word Reading and its Relationship to Recoding. In P.Gough, L.C.Ehri and R.Treiman (Eds) *Reading Acquisition*. Hillsdale, New Jersey: Lawrence Erlbaum Assoc.

Eisner, E. (1998) A vision for educational research and AERA in the twenty-first century. *Educational Researcher* 7(9):34

Elfer, P. and Selleck, D. (1999) Children Under Three in Nurseries: Uncertainty as a creative factor in child observations. *European Early Childhood Eduction Research Journal* 7(1): 69-82

Evans, L., Packwood, A., St. J. Neill, S.R. and Campbell, R.J. (1994) *The Meaning of Infant Teachers' Work*. London: Routledge

Ferreiro, E. and Teberosky, A. (1982) *Literacy Before Schooling*. London: Heinemann.

Foulds, K., Gott, R. and Feasey, R. (1992) *Investigative work in science: A Report by the Exploration of Science Team to the National Curriculum Council* Durham: University of Durham

Frith, U. (1985) Beneath the surface of Developmental Dyslexia. In K.E. Patterson, M. Coltheart and J. Marshall (Eds) *Surface Dyslexia* London: LEA

Fuson, K. (1997) Research-based mathematics curricula: New foundational goals require programs of four interacting levels of research. *Issues in Education* 3 (30): 67-80.

Galton, M. and Williamson, J. (1992) *Group Work in the Primary Classroom*. London, Routledge.

Galton, M., Hargreaves, L., Comber, C., Wall, D. and Pell, T. (1999) Changes in patterns of teacher interaction in primary classrooms : 1976-1996. *British Educational Research Journal,* 25 (1): 23-37.

Gardner, H. (1993) *Multiple Intelligences: The Theory in Practice* New York: Basic Books

Gardner, J.M.(1996) On consciousness in relation to memory and learning. In M. Velmans (Ed.) *The Science of Consciousness*, London: Routledge 66-89.

Gessell, A. (1988) *The Embriology of Behavior.* New York: Harper Brothers. Reissued 1988. London: Mac Keith. (Original work published 1945).

Glaser, D. (2000) Child abuse and neglect and the brain - a review, *Journal of Child Psychology and Psychiatry*, 41: 97-116

Godfrey, R. and Aubrey, C. (2001) Assessing Early Mathematical Development. In C. Morgan and K. Jones (Eds) *Research in Mathematics Education* Volume 3. Papers of the British Society for Research in Mathematics. London, BSRLM. 55-68

Goldschmied, E. and Jackson, S. (1994) *People Under Three*. London: Routledge

Gopnik, A., Melzoff, A. and Kuhl, P. (1999) *How Babies Think: the Science of Childhood*. London: Weidenfeld and Nicolson

Goswami, U. and Bryant, P. (1990). *Phonological Skills and Learning to Read*. Hove: Lawrence Erlbaum and Associates.

Gravemeijer, K. P. E. (1994) *Developing Realistic Mathematics Education*. Utrecht: CD-B Press.

Greenfield, S. (2000) *The Private Life of the Brain*. London: Penguin

Greeno, J. G., Collins, A. M. and Resnick, L. R. (1996) Cognition and learning. In D. C. Berliner and R. C. Calfree (Eds.) *Handbook of Educational Psychology.* New York: Macmillan.

Gregory,E.(1996) *Making Sense of a New World: Learning to read in a Second Language*. London:Paul Chapman Publishing.

Griffin, S., and Case, R. (1997) Re-thinking the primary school math curriculum: An approach based on cognitive science. *Issues in Education* 3 (1): 1-50.

Guha, M. (1987) Play in school in Blenkin, G. and Kelly, A.V. (Eds.) *Early Childhood Education A Developmental Curriculum* London: Paul Chapman 15-46

Gura , P. (Ed) (1992) *Exploring Learning: Young Children and Block Play.* London:Paul Chapman

Hall, N. and Robinson, A. (1995) *Exploring Writing and Play in the Early Years* London: Hodder and Stoughton

Hannon, P. (1995) *Literacy, Home and School: Research and Practice in Teaching Literacy with Parents* London: Falmer Press

Harlen, W. (1997) Educational research and educational reform. In S.Hegarty (ed) *The Role of Research in Mature Educational Systems* Slough: NFER

Harlen, W. (2000) *The development of user reviews of educational research*. BERA Seminar Paper 13/1/00

Harms, T., Clifford,M. and Cryer, D. (1998) *Early Childhood Environment Rating Scale, Revised Edition*. NY: Teachers' College Press

Hartley, D. (1993) *Understanding the Nursery School: a Sociological Analysis*. London: Cassell

Hay, L. (1979) Spatial temporal analysis of movements in children: Motor programmes versus feedback in the development of reaching. *Journal of Motor Behavior*, 11: 189-200.

Hennessy, S. (1993) Situated cognition and cognitive apprenticeship: implications for classroom learning. *Studies in Science Education*, 22: 1-41.

Hillage, J., Pearson, R., Anderson, A. and Tamkin, P. (1998) *Excellence in Research in Schools, DfEE Research Report RR74.* London: The Institute for Employment Studies.

Hogan, A. E., Scott, K. G. and Bauer, C. R. (1992) The Adapative Social Behaviour Inventory (ASBI): A new assessment of social competence in high risk three-year-olds. *Journal of Psychoeducational Assessments,* 10 (3): 230-239.

Hohmann, M., Barnet, B. and Weikart, D. (1979) *Young Children in Action: a Manual for Preschool Educators, the Cognitively Oriented Preschool Curriculum*. Ypsilanti: High/ Scope Press

Hopkins, J (1988) `Facilitating the development of intimacy between nurses and infants in day nurseries' *Early Child Development and Care*, 33: 99-111

Hopkins, J (1990) 'The observed infant of attachment theory' *British Journal of Psychotherapy* 6: 460-471.

House of Commons Select Committee for Education, Science and Arts (1988-89) *Educational Provision for the Under Fives* London: HMSO

House of Commons Select Committee for Education and Employment (2001) *Early Years* London: HMSO

Howes, C (1997) Children's Experiences in Center-Based Child Care as a Function of Teacher Background and Adult: Child Ratio *Merrill-Palmer Quarterly Journal of Developmental psychology* 43 (3): 405-425

Howes, C. and Hamilton, C.E. (1993) The changing experience of child care changes in teachers and in teacher-child relationships and children's social competence with peers. *Early Childhood Research Quarterly.* 8: 15-32

Howes, C., Mattheson, C.C. and Hamilton, C. (1994) Maternal, teacher and child care history correlates of children's relationships with peers. *Child Development* 65: 264 – 273.

Hughes, F.P. (1991) *Children, Play and Development.* Massachusetts: Allyn and Bacon

Hughes, M and Westgate, D (1998) Teachers and other adults as task partners for pupils in nursery and reception classes. In M.Woodhead, D.Faulkner and R.Littleton (eds) *Cultural Worlds of Early Childhood* London: Routledge 213-222

Hughes, M. (1986) *Children and Number. Difficulties in Learning Mathematics*. Oxford: Blackwell.

Hughes, M., Desforges, C. and Mitchell, C. (1999) Using and applying mathematics at Key Stage 1. In I.Thompson (Ed.) *Teaching Numeracy in Primary Schools* Buckingham: Open University Press 67-77.

Hughes, M., Desforges, C. and Mitchell, C. (2000) *Numeracy and Beyond* Buckingham: Open University Press.

Hurd, A. (1990) Concept development and social interaction skills. *Reading*. 24 (3): 128 – 132.

Hutt, S.J., Tyler, S., Hutt, C. and Christopherson, H. (1989) *Play, Exploration and Learning: A Natural History of the Preschool*. London: Routledge

Jackson, B. (1979) *Starting School.* London: Croom Helm

James, A. and Prout, A. (1990) *Constructing and Deconstructing Childhood: Contemporary Issues in the Sociological Study of Childhood.2nd Edition.* London: The Falmer Press.

James, A., Jenks, C., and Prout, A. (1998) *Theorising Childhood,* Cambridge: Polity.

Jowett, S. and Sylva, K. (1986) Does kind of preschool matter? *Educational Research*, 28: 21-31

Kavkler, M., Aubrey, C., Tancig, S. and Magajna, L. (2000) Getting it right from the start? The influence of early school entry on later achievement in mathematics. *European Early Childhood Education Research Journal* 8 (1): 75-94.

Kelly, V and Rose, J (1996) Action research and the Early years of Education E*arly Years* 17 (1): 41-46

Kelly-Byrne, D. (1989) *A Child's Play Life: An Ethnographic Study.* New York: Teachers' College Press.

Keogh, J.F., and Sugden, D.A. (1985) *Movement Skill Development*. New York: Macmillan.

King, R. (1978) *All Things Bright and Beautiful?* Chicester: Wiley.

Kleinberg, S. and Menmuir, J. (1995) Perceptions of mathematics in pre-five settings. *Education 3 to 13.* 23(3):29-34.

Kolb, D. (1984) *Experiential Learning: experience as the source of learning and development* London: Prentice-Hall

Kontos, S (1999) Preschool Teachers' talk, roles, and activity settings during free play *Early Childhood Research Quarterly*, 14 (3): 363-382

Kress, G. (1997) *Before Writing* London: Routledge

Laevers F (1993) Deep Level Learning-An Exemplary Application on the Area of Physical Knowledge. *European Early Childhood Education Research Journal.* 1 (1): 53-68

Laevers F (Ed) (1994) *The Leuven Involvement Scale for Young Children. Manual and Video. Experiential Education Series, No.1* Leuven: Centre for Experiential Education

Laevers F (2000) Forward to Basics! Deep –Level- Learning and the Experiential Approach *Early Years* 20 (2): 20- 29

Laevers, F (1996) *The Leuven Involvement Scale for Young children LIS-YC. Manual and Video Tape, Experiential Education Series No 1,* Leuven: Belgium: Centre for Experiential Education

Lakoff, G. and Johnson, M. (1980) *Metaphors We Live By.* Chicago: University of Chicago Press.

Lamb, M.E. (1996) 'Effects of non parental child care on child development: an update' *Canadian Journal of Psychiatry* 41: 330-342.

Lave, J. (1988) *Cognition in Practice.* New York: Cambridge University Press.

Lave, J. (1990) The culture of acquisition and the practice of understanding. In J. W. Stigler, R. A. Schweder and G. Herdt (Eds.) *Cultural Psychology: Essays on Comparative Human Development.* Cambridge: Cambridge University Press 309-327.

Leach, J., Driver, R., Scott, P. and Wood-Robinson, C. (1995) 'Children's ideas about ecology 1: theoretical background, design and methodology'. *International Journal of Science Education* 17 (6): 721 – 732

Leach, J., Driver, R., Scott, P. and Wood-Robinson, C. (1996) 'Children's ideas about ecology 2: ideas found in children aged 5 – 16 about the cycling of matter' *International Journal of Science Education* 18 (1): 19 – 34

Leach, J., Driver, R., Scott, P. and Wood-Robinson, C. (1996a) Children's ideas about ecology 3: ideas found in children aged 5 – 16 about the interdependency of organisms. *International Journal of Science Education* 18 (2): 129 –141

Lewis, A. (1996) Holding their own. Mainstream and special pupils working together. *Educational Psychology in Practice* 11(4): 10-16

Lewis, A. and Norwich B. (2000) *Mapping a SEN Pedagogy* Exeter: Universities of Warwick and Exeter

Lindsay, G. and Desforges, M. (1998) *Baseline Assessment: practice, problems and possibilities*. London: David Fulton

Lubeck S. and Jessup, P. (2001) Globalistion and its impact on early years funding and curriculum: reform in England and the United States. In T.David (ed) *Advances in Applied Early Childhood Education Vol 1: Promoting Evidence-based Practice in Early Childhood Education* London: JAI 227-252

Maclean,M., Bryant, P. and Bradley, L. (1987) 'Rhymes, nursery rhymes and reading in early childhood' *Merrill-Palmer Quarterly Journal of Developmental Psychology* 33 (3): 255-281

MacNaughton, G. (2000) *Rethinking Gender in Early Childhood Education* London: Paul Chapman Press

MacNaughton, G., Rolf, S. and Siraj-Blatchford, I. (eds) (2001) *Doing Early Childhood Research Education Buckingham: Open University Press*

Manning, K. and Sharp, A. (1977) *Structuring Play in the Early Years at School.* London, Ward Lock Educational.

Matthews, J. (1991) *Helping Children to Draw and Paint in Early Childhood* London: Hodder and Stoughton

Matthews, J. (1997). How children learn to draw the human figure: studies from Singapore. *European Early Childhood Education Research Journal*. 5 (1): 29-58.

Matthews, J. (1998) *The Art of Childhood and Adolescence* London: Falmer

Matthews, J. (1998a) The representation of events and objects in the drawings of young children from Singapore and London: implications for the curriculum. *Early Years.* 19 (1): 90-109.

Matthews, J. and Jessel, J. (1993) Very young children and electronic paint: the beginning of drawing with traditional media and computer paintbox. *Early Years*. 13 (2): 15-22.

Mayall, B. (1994) *Negotiating Health: Primary School Children at Home and School*. London and New York: Cassell

McGraw, M.B. (1963) *The Neuromuscular Maturation of the Human Infant*. New York: Columbia University Press.

McGuire, E.A.,Frackowiak, R.S.J. and Frith, C.D. (1997) Recalling routes around London: activation of the right hippocampus in taxi drivers, *Journal of Neuroscience*, 17: 7103-7110.

McGurk, H., Caplan, M., Hennessy, E. and Moss, P. (1993) Controversy, theory and social context in contemporary day care research. *Journal of Child Psychiatry* 34(1): 3-23

McNamara, D. (1994) *Classroom Pedagogy and Primary Practice.* London: Routledge.

McNeil, F. (1999) *Brain research and learning - an introduction. SIN Research Matters No. 10*, London: Institute of Education

Meade, A. (2000) If you say it three times, is it true? Critical use of research in early childhood education. *International Journal of Early Years Education* 8(1):15-25

Meadows, S. and Cashdan, A. (1988) *Helping Children Learn: Contributions to a Cognitive Curriculum.* London: David Fulton.

Melhuish, E. and Quinn, L. (2001) EPPNI Project: Paper Four of the EPPE Symposium at the BERA Annual Conference, Leeds University September 2001

Melhuish, E., Sylva, K., Sammons, P., Siraj-Blatchord, I., and Taggart, B., (2001) *Technical paper 7. Social/Behavioural and Cognitive Development at 3-4 years in relation to family background.* London: Institute of Education, University of London.

Mercer, N. (1992) Culture, context and construction of knowledge in the classroom. In P.Wright and G. Butterworth (Eds.) *Context and Cognition: ways of learning and knowing.* Hemel Hampstead: Harvester Wheatsheaf

Mercer, N. (1996) The quality of children's talk in collaborative activity in the classroom. *Learning and Instruction*, 6: 59-377.

Mills, C. and Mills, D. (1998) *Britain's Early Years Disaster*. London: Channel Four Television

Minns, H. (1997) *Read it to me Now: Learning at Home and at School*. Buckingham: Open University Press.

Mooney, A and Munton A (1997) *Research and Policy in Early Childhood Services: Time for a New Agenda*. London: Thomas Coram Research Unit. Institute of Education.

Mortimore, P. (Ed.) (1999) *Understanding Pedagogy and its Impact on Learning.* London: Paul Chapman Publishing.

Moss, P. (2001) Policies and provisions, politics and ethics. In T.David (ed) *Advances in Applied Early Childhood Education Vol 1: Promoting Evidence-based Practice in Early Childhood Education* London: JAI 79-96

Moss , P., Mooney, A., Munton T., and Statham, J (1998) *Local Assessments of Childcare Need and Provision* (Research Report No 72) Norwich: Department for Education and Employment/ HMSO

Moss P. Owen C. and Statham J. (1998) Informing ourselves about early childhood services *Children and Society* 12 (4): 263-74

Moss, P and Penn, H (1996) *Transforming Nursery Education*. London: Paul Chapman

Moss, P. (1999) Renewed hopes and lost opportunities: early childhood in the early years of the Labour Government. *Cambridge Journal of Education,* 29 (2): 229-238.

Moss, P. (2000) Workforce Issues in Early Childhood Education and Care. Paper prepared for consultative meeting on *International Developments in Early Childhood Education and Care.* The Institute for Child and Family Policy, Columbia University, New York, 11-12 May, 2000.

Moyles, J and Suschitzky, W (1994) The Comparative roles of Nursery Teachers and Nursery Nurses. *Educational Research*, 36: 247-258

Moyles, J and Suschitzky, W (1997) *Jills of all Trades? Classroom Assistants in KS1 classes* London: ATL- University of Leicester School of Education (Commissioned by The Association of Teachers and Lecturers)

Moyles, J and Suschitzky, W (1997a) *The Buck Stops Here..! Nursery Teachers and Nursery Nurses working together.* Leicester: University of Leicester School of Education

Moyles, J and Suschitzky, W (1998) 'Painting the cabbages red…! Differentially trained adults working together in early years settings to promote children's learning.', in L. Abbott and G. Pugh (eds.) *Training to work in the early years: Developing the climbing frame* Buckingham: Open University Press 120-135

Moyles, J and Suschitzky, W (1998a) Roles and responsibilities of support staff in KS1 classrooms. *Early Years*. 18 (2): 49-54

Moyles, J and Adams,S (2000) A Tale of the Unexpected: Practitioners Expectations and Children's Play' *Journal of Inservice Education* 26 (2): 349-369

Moyles, J and Adams, S (2001) StEPS *A Framework for Playful Teaching in the Early Years* Buckingham: Open University Press

Moyles, J., Adams, S. and Musgrove, A. (2001) *The Study of Pedagogical Effectiveness. A Confidential Report to the DfES.* Chelmsford: Anglia Polytechnic University.

Munn, P and Schaffer HR (1993) `Literacy and numeracy in social interactive contexts', *International Journal of Early Years Education*, 1 (3): 61-79.

Munn, P. and Schaffer, R. (1993) Literacy and numeracy events in social interactive contexts*. International Journal of Early Years Education*. 1 (3): 61- 80.

Munn, P. (1995) The role of organized *preschool* learning environments in literacy and numeracy development. *Research Papers in Education*, 10 (2): 217-252.

Munn, P. and Schaffer, H. R. (1993) Literacy and numeracy events in social interactive contexts. *International Journal of Early Years Education*, 1 (3): 61-80.

Munton, A.G. andMooney, A(1997) Enhancing Quality in Day Care: theories of Organisational Change *Early Years* 18 (1): 47-52

Munton, AG, Mooney, A and Rowland, L (1996) `Helping Providers to Improve Quality of Day-Care Provision: Theories of Education and Learning.', *Early Child Development and Care.* 1184: 15-25.

Murphy, P. (1997) Gender Differences: Messages for Science Education, in Harnquist and A. Burgen (Eds) *Growing up with Science: Developing Early Understanding of Science.* London: Jessica Kingsley/Academic European 162-185

National Institute of Child Health and Human Development Early Child Care Research Network (1997) The Effect of Infant Child Care on Infant-Mother Attachment Security: Results of the NICHD Study of Early Child Care. *Child Development,* 68 (5): 860-879

Newton, D. P. and Newton, L. D. (2000) 'Do Teachers Support Causal Understanding Through Their Discourse When Teaching Primary Science?' *British Educational Research Journal* 26 (5): 599 – 613

Nunes, T. and Bryant, P. (1996) *Children Doing Mathematics*. Oxford: Blackwell.

Nutbrown, C. (1999) *Threads of Thinking: Young Children Learning and the Role of Early Education.* (2nd edition) London: Paul Chapman

Nutbrown, C. (1997) *Recognising Early Literacy Development: Assessing Children's Achievement* London: PCP

Nutbrown, C. and Hannon, P. (1997) *Preparing for Early Literacy Education with Parents: a Professional Manual* Nottingham: Arnold/ REAL Project

OECD (2001) *Starting Strong: Early Childhood Education and Care* Paris: OECD

Office for Standards in Education (OFSTED) (1993) *First Class: The Standards and Quality of Education in Reception Classes.* London: HMSO

Office for Standards in Education (OFSTED) (1998) *The Quality of Nursery Education* London: HMSO

Office for Standards in Education (OFSTED) (1999) *The Quality of Nursery Education* London: HMSO

Ogden, L. (2000) Collaborative tasks, Collaborative Children: an analysis of reciprocity during peer interaction at Key Stage 1. *British Educational Research Journal*, 26 (2): 211 – 226.

Orsmond, G. I. and Miller, L. K. (1999) 'Cognitive, Musical and environmental correlates of early music instruction' *Psychology of Music* 27: 18-37

Osborne, J., Black, P., Smith, M. and Meadows , J. (1991) *Electricity, Primary SPACE Project Research Report* Liverpool: Liverpool University Press.

Osborne, J., Black, P., Smith, M. and Meadows, J. (1990) *Light, Primary SPACE Project Research Report* Liverpool: Liverpool University Press.

Osborne, J., Wadsworth, P., Black, P. and Meadows, J. (1994) *The Earth in Space, Primary SPACE Project Research Report* Liverpool: Liverpool University Press.

Packer, M.J. (1985) Hermeneutic inquiry in the study of human conduct. *American Psychologist,* 40: 1081-1093.

Pahl, K (1999) *Transformations: Children's Meaning Making in the Nursery*. Stoke on Trent: Trentham Books

Palmer, J. A., Suggate, J., Bajd, B., Tsaliki, E., Duraki, D., Paraskevopoulos, S., Razpet, N., and Dimec, S. (1999) Emerging knowledge of distant environments: an international study of four and six year olds in England, Slovenia and Greece. *European Early Childhood Education Research Journal* 7 (2): 17 – 38

Palmer, J.A. (1993) From Santa Claus to Sustainability: Emergent Understanding of Concepts and Issues in Environmental Science. *International Journal of Science Education* 15 (5): 487 – 495

Pascal, C. (1990) *Under Fives in Infant Classes*. Stoke-on-Trent: Trentham Books

Pascal, C. and Bertram, A. D, Ramsden, F., Georgeson, J., Saunders, M. and Mould, C. (1996) *Evaluating and Developing Quality in Early Childhood Settings : A Professional Development Programme* Worcester, Amber Publications

Pascal, C. and Bertram, A. D. (1997) The Effective Early learning Project: achievements and reflections. *Early Education* No 22. 4pp insert

Pascal, C., Bertram, A.D., Mould, C. and Hall, R. (1998) Exploring the relationship between process and outcome in young children's learning: stage one of a longitudinal study. *International Journal of Educational Research* 29 (1): 51-67.

Pascal, C., Bertram, A. D., Ramsden, F., Georgeson, J., Saunders, M. and Mould, C. (1997) *Effective Early Learning: case studies for improvement* Hodder and Stoughton

Pascal, C., Bertram, T. and Ramsden, F. (1997)*Effective Early Learning: Phase 3: final Report* Worcester: Amber Publications.

Pascal, C., Bertram, T. and Ramsden, F. (1997a)The Effective Early Learning Project: Reflections Upon the Action during Phase 1 *Early Years* 17 (2): 40-47

Pascal, C., Bertram, A.D., Gaspar, M., Mould, C., Ramsden, M. and Saunders, M. (1999) *Research to inform the Evaluation of the Early Excellence Centres Pilot Programme.* DfEE London

Pascal, C., Bertram, T., Gasper, M., Mould, C., Ramsden, F. and Saunders, M. (2001) *Research to Inform the Evaluation of the Early Excellence Centres. Pilot Programme* RR259 London: DfEE

Pellegrini, A.D and Boyd, B (1993) The role of play in early childhood development and education: issues in definition and function. In Spodek, B. (Ed) *Handbook of Research on the Education of Young Children* New York, Macmillan 105-121.

Penn, H. (2001) Research in the Majority World. In T.David (ed) *Advances in Applied Early Childhood Education Vol 1: Promoting Evidence-based Practice in Early Childhood Education* London: JAI 289-308

Penn, H. and McQuail, S. (1997) *Childcare as a Gendered Occupation.* Research Report RR23. London:DfEE

Peters, L., Davey, N., Messer, D. and Smith, P. (1999) An investigation into Karmiloff-Smith's RR model: The effects of structured tuition. *British Journal of Developmental Psychology* 17: 277-92.

Piaget, J. (1929) *The Child's Conception of the World* London: Routledge and Kegan Paul

Pollard, A., Broadfoot, P., Croll, P., Osborn, M. and Abbott, D. (1994) *Changing English Primary Schools: the impact of the Education Act at Key Stage One.* London, Cassell.

Pollard, A., and Triggs, P. with Broadfoot, P., McNess, E. and Osborn, M. (2000) *Policy, Practice and Pupil Experience*: *Changing English Primary Schools.* London: Cassell.

Popper, K. R. (1972) *Objective Knowledge: An Evolutionary Approach.* Oxford: Clarendon Press.

Porter, J. and Miller, C. (2000) Meeting the Standards*. British Journal of Special Education* 27 (2): 72-5

Prout, A. and James, A. (1990) *Constructing and Reconstructing Childhood* London: Falmer

Purcell-Gates, V. (1996) Stories,Coupons and the TV Guide:Relationship between home literacy experiences and emergent literacy knowledge. *Reading Research Quarterly* 31 (4): 406-428

QCA (1999a) *The Review of the Desirable Outcomes*. London: Qualifications and Curriculum Authority

QCA (1999b) *Early Years education, childcare and playwork A framework of notionally accredited qualifications. Outcomes*. London: Qualifications and Curriculum Authority

QCA/DfEE (1999) *Early Learning Goals.* London: DfEE.

QCA/DfEE (2000) *The Curriculum Guidance for the Foundation Stage*, May 2000, www.qca.org.uk

Ramachandran, V. S., and Blakeslee, S. (1998). *Phantoms of the mind*. New York: Quill William Morrow.

Ramey, C. T. and Ramey, S. L. (1998), Early Intervention and Early Experience, *American Psychologist* 53 (2): 109 – 120

Ramsden, M (1997) The Impact of the Effective Early Learning 'Quality, Evaluation and Development' process upon a Voluntary Sector Playgroup. *European Early Childhood Research Journal* 5 (2): 7-32

Reid, J.F.(1958)An investigation of thirteen beginners in reading, *Acta Psychologica* X1V (4): 294-313

Reid, J.F.(1966) Learning to Think about Reading. *Educational Research*. 9(1): 56–62

Riley, J. (1996) *The Teaching of Reading*. London: PCP

Rogoff, B. (1990) *Apprenticeship in Thinking: Cognitive Development in Social Context*. New York: NY University Press.

Rogoff, B. (1990) *Cognition in Practice.* New York: Cambridge University Press.

Rogoff, B. (1994) Developing understanding of the idea of communities of learners. *Mind, Culture and Activity*, 1 (4): 209-229.

Rosenthal, M. (2000) Quality in early childhood education. Paper presented at the *Curricula, Policies and Practices in Early Childhood Education University of Malta International Symposium*, Malta 28 Nov – 3 Dec. 2000

Roskos, K. and Christie, J. (2000) *Play and Literacy in Early Childhood.* New Jersey: Lawrence Erlbaum

Russell, T., and Watt, D. (1990) *Evaporation and Condensation. Report of the Primary SPACE Project Research Project* Liverpool: Liverpool University Press.

Russell, T. and Watt, D. (1990a) *Growth. Primary SPACE Project Research Project Report*. Liverpool: Liverpool University Press.

Russell, T., Bell, D., Longden, K. and McGuigan, L. (1993) *Rocks, Soil and Weather*. *Report of the Primary SPACE Project Research Project* Liverpool: Liverpool University Press.

Russell, T., Longden, K., and McGuigan, L. (1991) *Materials*. *Report of the Primary SPACE Project Research Project* Liverpool: Liverpool University Press.

Russell, T., McGuigan, L, and Hughes, A. (1998) *Forces*. *Report of the Primary SPACE Project Research Project* Liverpool: Liverpool University Press.

Rutter, M. (1995) Clinical implications of attachment concepts: retrospect and prospect. *Journal of Child Psychology and Psychiatry* 36(4): 549-71

Sammons, P., Sylva, K., Taggart, B., Melhuish, E., and Siraj-Blatchford, I. (2000) The Effective Provision of Pre- School Education [EPPE] Project: A Longitudinal study funded by the DfEE (1997-2003) Preliminary Findings Paper presented at the 13th *International Congress for School Effectiveness and School Improvement* (ISEIC 2000) Hong Kong

Schaffer, H.R. (1999) *Social Development*. Oxford: Blackwell.

Schmidt, R.A. (1975) A schema theory of discrete motor skill learning. *Psychological Review* 82: 225-260.

SCAA (School Curriculum and Assessment Authority) (1996) *Trials of Baseline Assessment Schemes* London: SCAA

Schweinhart, L J and Weikart, DP (1993) Success by Empowerment: The High/Scope Perry Pre School Study through age 27. *Young Children* 49 (1): 54-58

Schweinhart, L. and Weikart, D. (1993) *A Summary of the Significant Benefits: The High Scope Perry Preschool Study through Age 27*. Ypsilanti, MI: High Scope Press

Schweinhart, LJ. Weikart, D P and Larner, M (1986) Consequences of Three *Preschool* Curriculum Models through Age 15. *Early Childhood Research Quarterly* 1: 15-45

Senechal, M., Lefevre, J., Thomas, E. and Daley, K. E. (1998) Differential effects of home literacy experiences on the development of oral and written language. *Reading Research Quarterly* 33 (1): 96-116

SENTC (1996) *Professional Development to Meet Special Educational Needs. Report to the DfEE* London: SENTC

Sestini, E. (1987) The quality of learning experiences for four year olds in nursery and infant classes. In NFER/SCDC *Four Year Olds in School Policy and Practice.* Slough: NFER/SCDC

Shaw, S. and Hawes, T. (1998) *Effective teaching and learning in the primary classroom: a practical guide to brain compatible learning*. Leicester: Technical Services Ltd.

Shirley, M.M. (1931) *The First Two Years: a study of twenty-five babies. Vol.1: Postural and locomotor development.* Minneapolis: University of Minnesota Press.

Shorrocks , D Daniels, S Frobisher, L Nelson, N Waterson A and Bell J (1992) *ENCA 1 project: The Evaluation of National Curriculum Assessment at key Stage 1.* Leeds: School of Education University of Leeds

Shorrocks, D., Frobisher, L., Nelson, N., Turner, L. and Waterson, A. (1993) *Implementing the National Curriculum Assessment in the Primary School*. London: Hodder and Stoughton

Silk, A. Thomas, G. (1986) Development and differentiation in children's figure drawings. *British Journal of Psychology* 77 (3): 399-410

Singer, E. (1993) Shared Care for Children. *Theory and Psychology* 3(4): 129-149.

Siraj-Blatchford, I. (1996) Why Understanding Cultural Differences is not Enough in G. Pugh (Ed.) *Contemporary Issues in Early Years.* London: National Children's Bureau 119-36

Siraj-Blachford, I. (1999) Early Childhood Pedagogy: Practice, Principles and Research. In P. Mortimore (Ed.) *Understanding Pedagogy and its Impact on Learning.* London: Paul Chapman Press 20-45

Siraj –Blatchford, I Sylva, K., Melhuish, E., Sammons, P., Taggart, B. and Jennings, R. (1999) *Technical Paper 3 Contextualising EPPE: Interviews with Local Authority Co-ordinators and Centre managers* London: London University Institute of Education

Siraj-Blatchford, I. and Sylva, K. (2002) *The Effective Pedagogy in the Early Years Project. A Confidential Report to the DfES.* London: London University Institute of Education

Skelton, C. and Hall, (2001) *The Development of Gender Roles in Young children: a Review of Policy and Literature* Manchester: Equal Opportunities Commission

Slaughter, V., Jaakkola, R. and Carey, S. (1999) 'Constructing a Coherent Theory: Children's Biological Understanding of Life and Death' in M. Siegal and C. Peterson (eds) *Children's Understanding of Biology and Health* Cambridge, New York and Melbourne: Cambridge University Press. 71-96

Slavin, R.E. (1986) Best evidence synthesis: an alternative to meta-analytic and traditional reviews. *Educational Researcher* 15 (9): 5-11

Sloboda, J. and Davidson, J. (1996) The young performing musician. In I.Deliege and J.Sloboda (eds) *Musical Beginnings*. Oxford: Oxford University Press 214-229

Smith, P. (1993) Young children's depiction of contrast in human figure drawing: standing and walking. *Educational Psychology* 13 (2): 107-118.

Smith, P.K.(1988) 'Children's play and its role in early development: a re-evaluation of the 'play ethos'. In A. D. Pellegrini (Ed.) *Psychological Bases for Early Education* Chichester: Wiley 207-226

Solomon, J. (1994) 'Towards a Notion of Home Culture: Science Education in the Home' *British Educational Research Journal* 20 (5): 565 –578.

Stainthorp, R. and Hughes, D. (1999) *Learning from Children who Read at an Early Age*. London: Routledge.

Stephen, C. and Brown, S., Cope, P. and Waterhouse, S. (1999) Meeting children's education needs: the role of staff and staff development . In V.Wilson , and J. Ogden-Smith (Eds) *Preschool Educational Research: Linking Policy with Practice* Edinburgh: Scottish Executive Education Department .The Stationary Office

Stevenson, C. (1987) Young four year olds in nursery and infant classes: challenges and constraints. In NFER/SCDC *Four Year Olds in School Policy and Practice.* Slough: NFER/SCDC 34-43

Stonehouse, A. (1999) Play, a way of being for babies and toddlers. In E.Dau and E.Jones (eds) *Child's Play: Revisiting Play in Early Childhood Settings*. Sydney: MacLernan and Petty 152-165

Stout, J., Tymms, P., and Thompson, L. (2000). Change for the Better? The Impact of Baseline Assessment on Reception Class Teaching. In C. W. Day and D. van Veen (Eds.) *Educational Research in Europe Yearbook 2000*. Leuven - Apeldoorn: Garant 73-90

Streefland, L. (1991) *Realistic Mathematics Education in Primary School*. Utrecht: CD-B Press.

Suchman, I. A. (1987) *Plans and actions*. Cambridge: Cambridge University Press.

Sugden, D.A., and Keogh, J.F. (1990) *Problems in Movement Skill Development*. Columbia: University of South Carolina Press.

Sugden, D.A., and Wright, H.C. (1998) *Motor Coordination Disorders in Children*. Thousand Oaks, CA.: Sage Publications.

Suggate, J., Aubrey, C. and Pettitt, D. (1997) Children's mathematical knowledge in the first year at school. *European Early Childhood Education Research* Journal, 5 (2): 85-101.

Sutton-Smith, B. (1997) *The Ambiguity of Play.* Cambridge, Mass: Harvard University Press.

Sylva, K (1994) Appendix C. The impact of early learning on children's later development. In C.Ball *Start Right: The Importance of Early Learning*. London: RSA. 84-96

Sylva, K. (1999) The role of research in explaining the past and shaping the future. In L.Abbott and H.Moylett (eds) *Children and the Millenium* London: Falmer Press 165-178

Sylva, K., Roy, C. and Painter, M. (1980) *Childwatching at Playgroup and Nursery*. London: Grant McIntyre.

Sylva, K., Siraj-Blatchford, I., Johnson, S. (1992) The impact of the UK National Curriculum on *preschool* practice. *International Journal of Early Childhood* 24 (1): 41-51.

Sylva K and Wiltshire J (1993) The impact of early learning on children's later development. *European Early Childhood Education Research Journal* 1: 17-40

Sylva, K., Sammons, P., Melhuish, E., Siraj –Blatchford, I. and Taggart, B. (1999) *Technical Paper 1 An Introduction to the EPPE Project.* London: University of London Institute of Education.

Sylva, K Siraj-Blatchford, I Melhuish, E Sammons, P Taggart, B Evans, E Dobson, A Jeavons, M Lewis, K Morahan, M Sadler, S (1999a) *Technical Paper 6A Characteristic of Preschool Environments* EPPE Project .London: University of London Institute of Education.

Sylva, K., Melhuish, E., Sammons, P. and Siraj-Blatchford, I. (2001) The Effective Provision of Preschool Education (EPPE) Project. The EPPE Symposium at *The British Educational Research Association (BERA) Annual Conference*, University of Leeds, 13-15 September, 2001.

Sylwester, R. (1995) *A Celebration of Neurones: An Educator's Guide to the Brain.* Alexandria, VA: ASCD

Taylor Nelson Sofres with Aubrey, C. (2002) *The Implementation of the Foundation Stage in Reception Classes, Confidential Report to the DfES.* Richmond: Taylor Nelson Sofres.

Taylor, P.H., Oxon, G. and Holley, B. (1972) *A Study of Nursery Education, Schools Council Working Paper 41*. London: Evans/Methuen Educational

Thelen and Smith, l B. (1998) *A Dynamic Systems Approach to the Development of Cognition and Action* Massachusetts: The MIT Press.

Thelen, E. (1995) Motor development: a new synthesis. *American Psychologist,* 50: 79-95

Thomas, G. and Loxley, A. (2001) *Deconstructing Special Education and Constructing Inclusion* Buckingham: Open University Press

Thompson, C.(1999) Action, autobiography and aesthetics in young children's self-initiated drawings. *Journal of Art and Design Education* 18 (2): 155-161

Tizard, B. and Hughes, M. (1984) *Young Children Learning* London: Fontana

Tizard, B., Blatchford, P, Burke, J., Farquar, C. and Plewis, I. (1988) *Young Children at School in the Inner City*. Hove: Lawrence Erlbaum.

Tizard, B., Phelps, J. and Plewis, I. (1975) Play in preschool centres: play measures and their relation to age, sex and IQ. *Journal of Child Psychology and Psychiatry* 17: 251-62.

Tooley, J. and Darby, D. (1998) *Educational Research: A Critique* London: Ofsted

Trevarthen, C. (1995) The child's need to learn a culture. *Children and Society*, 9 (1): 5-19.

TTA (1998) *National Standards for Special Educational Needs Coordinators* London: TTA

Tunnicliffe, S. D., Lucas, A. M. and Osborne, J. (1997) School Visits to Zoos and Museums: A Missed Opportunity? *International Journal of Science Education* 19 (9): 1039 – 1056.

Turvey, M.T., and Fitzpatrick, P. (1993) Commentary: Development of perception-action systems and general principles of pattern formation. *Child Development* 64: 1175-1190.

Tymms, P. (1999) *Baseline Assessment and Monitoring in Primary Schools: Achievements, Attitudes and Value-added Indicators*. London: David Fulton Publishers.

Tymms, P., and Wiggins, A. (2000). Letter: schools' experience of league tables should make doctors think again. *British Medical Journal* 321: 1467.

Tymms, P., Menell, C. and Henderson, B. (2000) Baseline Assessment and Progress during the First Three Years at School. *Educational Research and Evaluation* 6 (2):105 – 129

Tymms, P., Merrell, C. and Henderson, B. (1997) The first year at school: a quantitative investigation of the attainment and progress of pupils. *Educational Research and Evaluation* 3 (2): 101 – 118

Valiente, C. (2001) Do political parties make a difference? In T.David (ed) *Advances in Applied Early Childhood Education Vol 1: Promoting Evidence-based Practice in Early Childhood Education* London: JAI 97-114

Van den Heuvel-Panhuizen, M. (1996) *Assessment and Realistic Mathematics Education*. Utrecht: CD-β Press

Vygotsky, L.S. (1978) *Mind in Society*. Cambridge, Mass: Harvard University Press.

Vygotsky, L.S. (1988) The genesis of higher mental functions.In K.Richardson and S. Sheldon (Eds.) *Cognitive Development to Adolescence.* Hove: Lawrence Erlbaum 61-79

Wade, M.G., and Whiting, H.T.A. (Eds.) (1986) *Motor Development in Children: Aspects of coordination and control*. Dordrecht, Netherlands: Martinus Nijhoff.

Walkerdine, V. (1982) *Girls and Mathematics*. London:Virago

Walkerdine, V.C. (1981) Sex, power and pedagogy. *Screen Education* 38:14.24

Watt, D. and Russell, T. (1990) *Sound, Primary SPACE Project Research Project.* Liverpool: Liverpool University Press.

Weinberger, J. (1996) *Literacy Goes to School: The Parent's Role in Literacy Learning*. London: Paul Chapman.

Wells, C.G. (1987) *The Meaning Makers: Children Learning Language and Using Language to Learn*. London: Hodder and Staughton

Wells, C.G. (1988). The roots of literacy. *Psychology Today* 22: 20-22

Wells, C.G. and Raban, B. (1978). *Children Learning to Read*. Unpublished Final SSRC Report (lodged in School of Education Library, University of Bristol, 19 Berkeley Square, Bristol)

West. A., Hailes, J., Sammons, P. (1997) Children's Attitudes to the National Curriculum at Key Stage One. *British Educational Research Journal*, Vol. 23 (5): 597-613

Willat, J. (1977) *The Child's Representation of the World*. New York: Heinemann Press

Wolfendale, S. (1993). *Baseline Assessment: A Review of current practice, issues and strategies for effective implementation*. Stoke-On-Trent: Trentham Books/ OMEP

Wolfendale, S. and Lindsay, G. (1999) Baseline Assessment of Literacy Special Issue of *Journal of Research in Reading* 22 (1): 1-7

Wood, D., McMahon, L. and Cranstoun, Y. (1980) *Working With Under Fives.* London: Grant McIntyre

Wood, E. and Bennett, N. (2000) *Progression and Continuity in Early Childhood Education*. Final report to Economic and Social Research Council.

Wood, L and Bennett, N (1997) The rhetoric and reality of play: teachers' thinking and classroom practice. *Early Years* 17 (2): 22-27

Woodhead, M. (1998) Quality in early childhood programmes - a contextually-appropriate approach. *International Journal of Early Years Education* 6(1): 5-17.

Woodhead, M. (1999) Towards a global paradigm for research into early childhood education. *European Early Childhood Education Journal* 7 (1): 5-22.

Wragg, E.C., Bennett, S.N. and Carre, C.G. (1989) Primary Teachers and the National Curriculum. *Research Papers in Education* 4: 17-37

Wright, B., Stanger, G., Cowper, M. and Dyson, R. (1993) First-graders' progress in an experimental maths recovery program. Paper presented at Sixteenth Annual *Conference of the Mathematical Education Research Group*, Brisbane, Australasia, 9-13 July, 1993.

Young, J. (1995) *Young Children's Apprenticeship in Number*. Unpublished PhD, University of North London.

Young, M. (1999) The curriculum as socially organised knowledge in McCormick, R. and Paechter, C. (eds) *Learning and Knowledge*. London: Paul Chapman Press 56-70

Young, S. (2000b) Spontaneous music-making on instruments in the nursery: reporting a research project and some implications for practice Paper presented at *BERA Annual Conference* Cardiff University

Young-Loveridge, J. M. (1993) *The Effects of Early Mathematics Intervention. The EMI-5s Study. Volume 1: Report of Findings.* Department of Educational Studies, University of Waikato, NZ

Endnotes

[i] An EYDCP has been set up in every local authority in England to bring together all the stakeholders involved in provision of education and care facilities for young children and out of school care facilities for older children. These bodies have the responsibility of gathering information and improving the levels and quality of provision in the local authority area. Representation on these bodies includes parents, practitioners, employers, elected members.

[ii] Not until the New Labour government instituted its National Childcare Strategy (May 1998) and instituted annual audits has there been a systematic attempt to document all provision and keep the documentation up to date. So the very prerequisites for systematic and quantitative research have been absent until recently, (Moss et al 1998)

Even now because the audits have been carried out under different formats in different local authorities we still do not have a robust national picture and the data has not been systematised to provide a national database.
The individual reports rest with the DfEE and individual bodies, for example the National Children's Bureau has tried to analyse some of them.

[iii] The QCA's list is as follows:

Nursery assistant, *preschool* assistant, crèche assistant, parent/toddler group assistant, playgroup assistant, toy library worker, homestart worker, mother's help, baby sitter/au pair (suggest cache level 2 NVQ)

Nursery supervisor, *preschool* leader, crèche leader, playgroup leader, special educational needs supporter, nursery nurse, nanny, childminder (suggest NVQ3):
Play work assistant, playworker, playworker, holiday playscheme worker , adventure playworker (suggest level 2);
Senior playworker, co-coordinator (NVQ3); and
Playwork manager, playwork development officer (NVQ4 in playwork).

[iv] One of the difficulties in carrying out this research is the difficulty of classifying different institutions. For example, in the Independent Day nursery workforce survey (1998) it was argued that some providers did not return the questionnaires because they did not regard themselves as falling into the category listed, ('full day care all the year round'), while others returned the questionnaire, when they provided supervised meals, even though they did not provide care all year round. However information on this group of providers could have been lost altogether, as they would not necessarily have been picked up by other surveys.