Curriculum Architecture – a Literature Review

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Report

for

The Scottish Executive Education Department

to inform the implementation

of

A Curriculum for Excellence

Professor Brian Boyd, Professor Aline-Wendy Dunlop,

Dr June Mitchell, Jenny Logue, Eleanor Gavienas, Liz Seagraves,

Colleen Clinton and Dr Ross Deuchar

University of Strathclyde

Jordanhill Campus

Glasgow G13 1PP

www.strath.ac.uk

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Disclaimer

The work in this report and the views expressed within it are those of the authors and not those of the University of Strathclyde or of the Scottish Executive Education Department and Ministers.

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Executive Summary of the Literature Review on Curriculum Architecture

The task

The analysis of almost 400 abstracts, articles, books from academic sources, policy documents and the educational press has been undertaken to attempt to illuminate the concept of Curriculum Architecture. The phrase itself is not current in the Scottish educational discourse. This review has attempted to look at the international research literature, available over the past ten years or so, on the sub-themes identified in the SEED specification.

This review is organised around the following main areas:

- The context
- The concept
- Early years and primary education
- Secondary education
- Transitions and transfers.

The concept of Curriculum Architecture is addressed and is broken down into its sub-themes. In the secondary context, in particular, there are some fifteen of these, some of which have a rich and varied literature while others are less well represented. While it is difficult to reach a single overarching conclusion across such a range of themes, nevertheless, the review attempts to draw out from the literature messages which might be of value to school leaders and curriculum managers in rising to the challenge of implementing *A Curriculum for Excellence.*

Curriculum Architecture: the Context

A Curriculum for Excellence, published in 2004 and followed in 2006 by *A Curriculum for Excellence: progress and proposals* (2006a)*,* is the Scottish Executive's flagship policy on the curriculum 3-18. The original document set out the principles which should underpin curriculum planning and proposed four purposes for the curriculum, namely that children and young people should be enabled to become:

- Successful learners
- Confident individuals
- Effective contributors
- Responsible citizens

The spirit of the report was to give education professionals more autonomy in planning an appropriate curriculum for their pupils taking account of local circumstances while adhering to its principles and purposes.

A Curriculum for Excellence outlined a number of design principles*:*

- Challenge and enjoyment
- Breadth
- Progression
- Depth
- Personalisation and choice
- Coherence
- Relevance

These were derived in part from those which underpinned previous curricular programmes such as 5-14, but expanded and re-aligned. A number of these feature in the specification for the current review.

The *progress and proposals* document contained four key elements which should inform schools' curriculum planning*:*

- Ethos and life of the school as a community
- Curriculum areas and subjects
- Interdisciplinary projects and studies
- Opportunities for personal achievement

Review specification

The aspects of curriculum structure identified in the specification document were as follows:

- the concept of curriculum architecture;
- The notion of the extended school, going beyond conventional curriculum architecture;
- The range of issues which in turn impact differentially on the design of the curriculum at organisational level and on learners, including:

class organisation
school size
school timetabling
starting age of formal schooling
transition arrangements between early years to primary, primary to secondary, S3-S4 (equivalent), school to college
groupings of learner outcomes and interdisciplinary projects and courses.

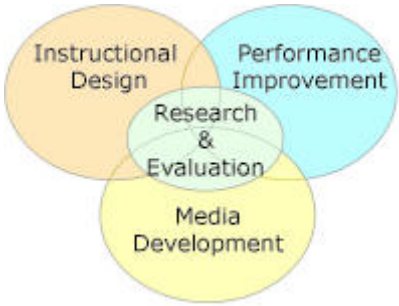
whilst touching on issues such as class size.

- The relationship between curriculum architecture and assumptions made about how learning occurs;
- Relationship between curriculum structures and teacher assumptions and pupil aspirations;
- Differential impact of structures on sub-groups of learners, such as pupils from minority ethnic backgrounds, on boys and girls, on pupils from different socio-economic background; on pupils who are at the younger end of the age spectrum; on working class pupils;
- Teacher responses to changes in curriculum architecture;
- Notions of pedagogy and the impact of curriculum architecture;
- The impact of decisions at a school level on pupils from black and minority ethnic backgrounds;
- The nature of courses offered in schools at various levels and issues of discipline-based versus integrated knowledge, the academic /vocational question, teaching for understanding.

Curriculum Architecture: the Concept

While *A Curriculum for Excellence* and subsequent documents have used phrases such as "curriculum planning" and "curriculum design". "Curriculum architecture" is a different concept, first found in the literature in the United States with reference to the College and University sectors.

Issues such as instructional design, performance technology, technology-mediated learning and performance improvement are the main focus, and it is argued that "to accomplish our educational goal, it is critical to have an architecture of curriculum that reflects the current competency standards of the fields."



Curriculum architecture is not simply about structural issues but the extent to which the underlying aims of the curriculum are reflected in the pedagogies in classrooms. Indeed, the early American literature was advocating that each school must create its own curriculum, based on its own study of its students, its community, its faculty, and with the real involvement of the students themselves – a "learner-centered" approach to curriculum planning.

Early Years and Primary School

The concept of curriculum architecture has not yet developed a strong currency in the literature relating to early years and primary school. Numbers of component parts within curriculum architecture have been researched and brought together in the present review. In particular the review focuses on pedagogy, early education as a separate or continuous phase, learning environments, class size, class organization, grouping practices, sub-groups of pupils, formative assessment, pupil motivation and motivated teachers, and the normative nature of effectiveness. Often the literature separates early years and primary education: here the focus on themes that permeate both early years and primary school is summarised below.

- *Pedagogy* emerges as one of the most important elements of curriculum architecture. Concepts of sustained shared thinking, joint construction of meaning, deepening learning, differentiation and diversity each make a key contribution to bridging curriculum content and learning and teaching approaches.
- A strong literature focuses on early childhood and addresses whether *early education should be viewed as a separate or continuous phase.* Findings focus on: three to six years emerging as a distinct phase; high expectations of early childhood education as a vehicle addressing disadvantages; the enhancement of both cognitive and socio-emotional aspects of learning and development; holistic, active and self-

regulatory approaches to learning as crucial, and on the significance of early educational transitions.

- *Learning environments* are earning an increasing emphasis in the literature and the influence of environment should be addressed particularly in terms of accommodation, interaction, resources, programme structure, learning activities and parental involvement
- The relationship between *class size* and pupil learning has often been contested. Typical factors taken into account are physical space, grouping practices, discipline, ethos, peer relationships and teacher interaction. There is evidence that concludes class size can make a difference to pupil learning in early years, particularly for low achievers and children from ethnic backgrounds.
- In terms of *class organization* the strongest message emerging from the literature is twofold, that classroom organization has a primary function of promoting pupil involvement, and should also be flexible and strategic to support children's learning.
- Standard approaches to *grouping practices* should be reviewed in the light of evidence from the literature that shows that seating arrangements and pedagogical practice are often poorly linked.
- Addressing the needs and rights of *particular groups* of pupils is particularly emphasized in a climate of inclusion and attention to diversity. Findings reveal that the push to normalize the pupil rather than to change environment or teaching approach remains common, but approaches to combat change are being developed.
- *Formative assessment* promises to provide practitioners with the evidence to support particular groups of pupils as well as pupil learning in general.
- The concepts of *pupil motivation and motivated teachers* are found to be key drivers in the development of a curriculum architecture to support the aims of successful learners, confident individuals, effective contributors and responsible citizens within the early years and primary levels of a 3-18 curriculum. By combining concepts of pupil and teacher motivation, joint agency is promoted.
- The normative nature of effectiveness emphasises 'the primary task' of early and primary education and how this is arrived at, which includes paying attention to the school culture, continuity of staffing, the mindsets that produce effective and enriched teaching, attention to classroom processes and the importance of both leadership and management.

Secondary school

The extent and scope of the literature was uneven. There was little if anything which looked at the over-arching concept of curriculum architecture as it applies to the secondary school. Among the sub-themes, some issues were more thoroughly covered in the literature than others. The findings, theme by theme, are summarized below:

- Secondary *school timetabling* should facilitate learning rather than organisational efficiency. Flexibility should be used to ensure that the length of learning episodes is related to the desired pedagogy. Any flexibility offered to schools may not be taken up unless they are confident that the system of accountability will recognise diversity.
- *Choice and personalisation* will only lead to improved achievement and engagement if pupils are active participants in the process and if it is given high status in schools and beyond. If low attaining pupils are simply given low-status choices, they will not make the progress of which they are capable. Choice needs to go far beyond simply choosing courses; it must be part of the culture of the school and should extend to core activities such as learning and teaching.
- The issue of *class organisation* is a contentious one. Setting is increasing but there is no discernible increase overall in results as a consequence. There are significant differences in attainment among pupils of similar ability placed in higher of lower sets. There is a relationship between setting and variables such as socio-economic status, gender and ethnicity (and age). Pupil attitudes to setting vary from study to study. Setting appears to narrow the range of strategies used. Teachers' use of within class grouping is not well represented in the literature in secondary schools.
- *Ethos and culture* are well represented in school effectiveness and school improvement literature. There are few studies which explicitly link these factors with curriculum architecture. The literature is stronger on the link between ethos and pupil engagement than it is on pupil attainment.
- The impact of curriculum architecture on *sub-groups within schools* is a key issue. The issue of gender is more problematic in secondary schools. It should have a clearer policy focus than at present. CPD for staff is a key element in addressing the impact of school structure, curriculum and pedagogy on boys and girls. In Australia, the conclusions are that young women need considerable support to realise their potential and that relationships, pedagogy, CPD and the creation of 'professional learning communities' are key. Similarly in Australia it was found that smaller

schools are more likely to narrow the gender gap (Lingard, 2002). However, it is teacher- and class-level factors which are the most significant.

- The issue of *ethnicity* has been studied in England in recent years. The twin issues of fluency in English and gender are pupil-level characteristics associated with success or failure. Personalisation of the curriculum, appropriate and varied pedagogies, partnerships with parents, mentoring of pupils and CPD are key elements schools must address. A 2003 DfES policy document advocates Citizenship as a key vehicle for addressing issues of ethnicity and underachievement. Policies should empower young people and their families to take part in the decision-making process in relation to school policies and systems.
- Research into *vocational education* is taking place across the world, most notably in Australia, England and Canada. There are problems of organisational culture at the school level which make it difficult for vocational courses to have parity of esteem with academic. There is teacher resistance and a tendency to offer such courses only to the 'less able'. Middle class schools can be resistant to the importance of vocational courses (Taylor, 2006). It is advocated that schools have a broad, general curriculum with vocational options suited to all levels of ability. Partnerships between schools, other providers, business and parents can be successful. Work-based qualifications gained by young people must be recognised and valued by the school and by further and higher education.
- *Pedagogy* emerges as a key element of curricular architecture. A pedagogy "without limits" is one which sets out to avoid labelling of pupils on the basis of narrow measures of attainment. In Taiwan, teachers teaching together in teams, collaborating in improving learning and teaching, has been found to be associated with improved pupil outcomes. The link between pedagogy and improvement in pupil achievement is prominent. Meta-cognition emerges as a key issue with the students as co-agents in this endeavour irrespective of background or ability. Studies on the role of ICT in learning suggest the hardware is less important than the pedagogy and that teacher CPD and collaborative working are more likely to ensure effective use of the technology. If pedagogy is to be varied and if 'deep' learning is the aim, then the timetable must enable longer episodes of learning to be created when required.
- Linked closely to pedagogy is *assessment*. Evidence from New Zealand and Sweden suggests that the secondary school, with its high stakes, summative assessment focus, is the most difficult to change to formative assessment practices. Change will happen when teachers are confident enough to engage with pupils in discussions which lead to peer and self-assessment, which de-emphasise marks and

grades and which focus on assessment for learning. Studies in European countries which have recently shifted the balance towards formative assessment suggest that as long as grades are as part of the Higher Education 'sifting process', they will remain influential in the school system.

- The issue of *school size* is not one on which there is conclusive evidence. Many non-empirical studies support small schools' right to existence (Ofsted,2000). Ethos and culture are felt to balance any claims that larger schools can offer a broader curriculum. Indeed, in the secondary sector, larger schools often offer more sections in each subject area, rather than more subjects, to pupils. Most studies concentrate on links between school size and pupil attainment; only a minority look at the impact of size on how the curriculum is structured.
- The issue of *school design* appears mainly in policy-related documents. There have been attempts made by Governments to remind planners and policy-makers to take account of existing policies when planning new schools. In New Zealand, when large (mostly secondary) schools are being build, consideration is given to creating schools-within-schools, of around 400 pupils to ensure that no child is lost in the system. In Denmark, there has been a commitment to ensure that no school will be built without reference to international research on school design.
- *Teacher attitudes and belief systems* have been shown to be crucial aspects of curriculum architecture. Since all teachers do not share the same belief system in terms of pedagogy, it is important that change at a system level engages with teachers. It cannot simply impose a change without causing teacher stress and alienation.
- The *extended school* concept, with a collaborative ethos across agencies and organisations with an interest in young people and their families, appears in the literature. Schools which extend outwards into their communities and inwards in terms in terms of the services, curricular and extra-curricular, offered, have been successful.
- The issue of *young people who tend to fail* in school is not yet prominent in the research literature as far as curriculum architecture is concerned. One Spanish study provides a model which appears to offer insights into empowering the most disaffected young people in our schools.
- The research evidence on *inter-disciplinary* as opposed to *subject-based* approaches is not conclusive, although recent work on "rich tasks" in Queensland is promising in terms of pedagogy and pupil engagement. Inter-disciplinary approaches are proposed as a means to allow learners to make connections and to transfer skills.

However, the barriers in the system, not least from subject-based vested interests have to be acknowledged. The consensus from the research suggests that while inter-disciplinary approaches must be based on a convincing rationale, they can offer opportunities for 'joined-up' learning which subjects cannot always offer. They may also, paradoxically, help learners towards a clearer understanding of the contribution of individual disciplines.

- The issue of *class size* has been dealt with elsewhere. Evidence from the USA and England suggests that the reduction must be significant and should begin early in the learner's school career.

While the above may not add up to a coherent concept of curriculum architecture, it may, nevertheless offer some guidance to curriculum planners.

Transitions and transfers

Early years and primary

Interest in early childhood educational transitions tends to be motivated by questions as to whether pre-school education makes a difference to later outcomes, and therefore whether there are sufficient links between home and pre-school, and pre-school and early primary education. Research on transitions in western cultures originally focused on pastoral aspects in order to address children's social and emotional well-being at school start: in a number of cases these researchers have moved towards work on the perspectives of various stakeholders in transitions, most often parents, teachers and children. More recently a focus on transitions in learning and curricular transitions has developed as definition of curriculum in early childhood programmes has become more widespread. The rich and growing literature on early childhood transitions is particularly relevant in relation to a 3-18 curriculum approach. Key factors which emerge from the literature on early years transitions include the following:

- Transitions are complex
- Learning should be better supported across the transition to school
- Social-emotional well-being should be supported across the transition to school
- Playful learning and common pedagogy supports the transition to school
- Parental participation in early childhood transitions is beneficial
- Going to school with a friend is helpful for young children

- Diversity should be recognised and provided for at school entry
- The role of a transitions coordinator could be usefully explored
- Initial success at school both socially and intellectually, leads to a virtuous cycle of achievement
- Children, families, educators and schools should aim to build 'transitions capital'

Primary-secondary liaison

Studies from across the UK find that the pastoral care surrounding primary-secondary transfer is of a high order and that vulnerable young people in particular receive a great deal of support. However, the complexity of the secondary school system, the continued existence of the 'fresh start' approach and the lack of continuity and progression of learning remain problematic. The link between continuity and progression is not a simple one; some pupils make progress despite discontinuity. The definition of 'progress' may not be shared among teachers within and across sectors. Evidence for the S1/S2 (Years 7 and 8) 'dip' in pupil attainment is not conclusive, but there is stronger evidence for progress being slower than primary data would have predicted.

There is evidence of a lack of communication across the sectors of meaningful information and of underestimations by secondary teachers of what pupils can achieve. Some studies report a narrowing of pedagogy in early secondary and an increasing pressure on teachers and pupils in terms of 'downward incrementalism' of the examination system. The literature suggests that structures alone will not solve the problems of primary-secondary transfer; what is needed is time for face-to-face training, discussion and collaborative teaching across the sectors.

Secondary school and beyond

Canadian studies suggest that there are resources in the system for school-work programmes but they are patchy across the country. Not all of the stakeholders accord equal status to these programmes and they are often targeted at the less academic students. In Scandinavia, "Flexibility in studies and in teaching methods" was singled out as being the most important issue in combating the drop-out rate from secondary schooling and in laying the foundation for lifelong learning. Short, job-related courses were advocated as well as collaboration with the business community. English studies suggest that greater employer involvement, more pupils working towards recognised industry qualifications and fifty per cent increase in the number of pupils gaining 5 GSCEs (A to C) are indicators of success. In New Zealand, the National Qualifications Framework means that students can

simultaneously gain credit towards the National Certificate of Educational Achievement and towards a vocational National Certificate. This has promoted an unprecedented level of co-operation between schools and Further Education colleges.

Conclusion

The literature provides evidence that curriculum architecture is a key concept for curriculum planners. It can significantly affect the ways in which the curriculum is accessed, experienced and understood by learners. Decisions taken about aspects of curriculum architecture are not value-neutral and schools, learning communities and local authorities should take an evidence-based approach to curriculum architecture.

1. Background: the Scottish context

1.1 Policy

The recent report, *A Curriculum for Excellence: progress and proposals* (2006), in the section "Proposals: looking at the curriculum differently", talks of different routes for progression from one stage to another" (p9) and suggests that "different areas and subjects will be refreshed" (p10). It goes on to make a strong case for "interdisciplinary studies" (p10) and argues that these need to be "well planned with a clear purpose and outcomes in mind" (p10).

While the term curriculum "architecture" is new in the Scottish discourse on curricular change, the concept is not new. For the term to be meaningful, it is necessary distinguish it from similar terms in common usage, such as "curriculum design" or "curriculum organisation". The appearance of the term on page 25 of the report *A Curriculum for Excellence: progress and proposals* may well be the first in such a publication. It is not the same as "curriculum design" which appears in *A Curriculum for Excellence* on page 14. Curriculum design relates to a set of principles which should underpin the curriculum. Curriculum architecture includes a wide range of issues which might affect how the curriculum is experienced by pupils, from the size of the school and classes within it to whether the curriculum is organised around subjects or inter-disciplinary approaches; from the ways in which pupils are organised for learning to the opportunities for personalisation and choice; from the timetable to the management of transitions and transfers among the sectors of schooling and beyond.

Advice on aspects of curriculum architecture has been given in recent years in Scottish education. The Scottish Consultative Council on the Curriculum's 1999 document, *Curriculum Design for the Secondary Stages,* became a reference point for all secondary headteachers and local authority timetablers. Perhaps unintentionally, it resulted in a degree of uniformity in timetabling structure (notably the 30-period week/8-option column model, now changing to a 33 period week in many authorities) across the country. The 5-14 document, *National Guidelines on the Structure and Balance of the Curriculum (2000),* had a not dissimilar effect, with a rigidity in the application of the suggested curricular time allocations and a dearth of examples of innovative deployment of the Flexibility Factor offered by the Guidelines document.

The two documents on flexibility, *Flexibility in the Secondary Curriculum – emerging practice (LTS, 2003a)* and *Focusing on curriculum flexibility in secondary schools – a paper for*

professional reflection (LTS, 2003b) could be said to reflect the difficulties posed to a system unused to such flexibility and struggling with the issues around the extent of innovative practice acceptable and unsure of where in the current structures such flexibility would be tolerated. The SEED Circular (2001), which in one sense was the originator of the debate, did not initially inspire innovative practice (with the exception of innovative "alternative to exclusion" provision). The reluctance to embrace the freedoms offered by these documents has been described as the "caught in the headlights" phenomenon; schools, having been driven by an accountability agenda, simply did not believe the new exhortations towards flexibility.

HMIE's recent publication, *Improving Scottish Education* (2006), provides a steer on both key strengths of each sector and on aspects for improvement. Across each of the school sectors improvement in leadership emerges as a strong theme. In the pre-school sector aspects for improvement also include the quality of children's learning, individual learning needs, additional support, extending understanding and the use of information on children's learning to promote their future progress (p10). In the primary sector there is again a focus on the quality of pupils' learning experiences – a particular focus is made on variability, relevance and engagement, with a need for higher expectations for P6 and P7 pupils and for those with lower attainment (p24). At secondary level, successful learning for all and a focus on achievement are underpinned by concepts of responsibility and accountability for improving the quality of the service for all. Each of these aspects for improvement needs to be interpreted in terms of what they mean for curriculum architecture.

The *Progress and Proposals* document's section, "What might be different?" is key to the issue of curriculum architecture. Each of the three main sectors, early years, primary and secondary, is addressed separately (pp.19-20). A number of these have implications for curriculum architecture:

- better continuity between children's pre-school and P1 experiences
- some adjustments to curricular areas (including 'de-cluttering' of subject content
- greater scope for different approaches to curriculum design from S1 to S3
- scope to plan S4 to S6 as single stage.

Later in the document, in the *Implications* section, there is the clearest statement of all:

"They [headteachers or other leaders] will also have opportunities to be creative in curriculum design, learning from evidence of practice, with clear parameters for flexibility." (p21)

In interpreting the requirements our review will contain:

- a discussion of the concept of curriculum architecture and its implications for primary and secondary schools
- an overview of recent international curriculum architecture policy and practice
- information about countries that have recently undertaken reviews of or changes to curriculum architecture
- the extent to which curriculum architecture is inclusive in its impact on pupil motivation and achievement
- the key features of curriculum architecture in the countries surveyed
- indications of where the Scottish model differs from other countries and why
- a collation of the published evidence of the effectiveness of the various approaches
- reflection on how successful approaches could be applied in implementing ACfE in Scotland.

The design principles of *A Curriculum for Excellence:*

- challenges and enjoyment
- breadth
- progression
- depth
- personalisation and choice
- coherence
- relevance

are derived from the principles which underpinned previous curricular programmes such as 5-14, but have been expanded and re-aligned. A number of these feature in the specification for the current review.

Finally, the four key elements outlined in the *progress and proposals document:*

- ethos and life of the school as a community

- curriculum areas and subjects
- interdisciplinary projects and studies
- opportunities for personal achievement

are also contained within the specification for this review.

1.2 Review specification

The aspects of curriculum structure identified in the specification document were as follows:

- the concept of curriculum architecture;
- The notion of the extended school, going beyond conventional curriculum architecture;
- The range of issues which in turn impact differentially on the design of the curriculum at organisational level and on learners, including:

  class organisation
  class size
  school size
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  transition arrangements between early years to primary, primary to secondary, S3-S4 (equivalent), school to college
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whilst touching on issues such as class size.

- The relationship between curriculum architecture and assumptions made about how learning occurs;
- Relationship between curriculum structures and teacher assumptions and pupil aspirations;
- Differential impact of structures on sub-groups of learners, such as pupils from minority ethnic backgrounds, on boys and girls, on pupils from different socio-economic background; on boys; on pupils who are at the younger end of the age spectrum; on working class pupils;
- Teacher responses to changes in curriculum architecture;
- Notions of pedagogy and the impact of curriculum architecture;

- The impact of decisions at a school level on pupils from black and minority ethnic backgrounds;
- The nature of courses offered in schools at various levels and issues of discipline-based versus integrated, knowledge, the academic /vocational question, teaching for understanding.

1.3 Organisation of the review

The review is organised into three broad sections:

Early years and primary	structures, staff deployment; organisation of learners; impact on pupils in general and by sub-group
Secondary	timetabling structures, organisation of courses; class organisation; impact on pupils in general and by sub-group;
Generic	transitions, school size, resource allocation, staffing, etc.

David Hopkins (2005), at an LTS-sponsored conference, spoke on the issue of structural change in the education system in England and Wales. He explored how system change impacts on schools and on classrooms. Donald McIntyre and colleagues (Hart et al,2004) have written powerfully on the impact of curriculum architecture, most notably "ability-focused teaching", on groups within the pupil population. As recently as June 2006, the TESS carried a front-page report of Scottish research on pupils' perception of the effects of class organisation.

The following sections will explore these issues by drawing on:

- research–based literature since the late 1990s
- academic articles and policy documents from around the world
- contributions from the educational press which have a research or policy perspective

It has to be acknowledged at the outset that the search threw up an uneven spread of sources. Some areas within the scope of curriculum architecture are well represented in the

literature (e.g. class organisation and personalisation/ choice), while others are much less so (e.g. ethnicity and school size). The parameter of the late 1990s as a starting point may be a factor, but is also likely that the link to curriculum architecture as opposed to education more broadly was a more important limiting factor.

2. Curriculum architecture: the concept

There is a growing body of published work on the issue of curriculum architecture in the United States of America, albeit with a focus on higher education. In 2005, St Joseph's University in Philadelphia (Brady *et al*, 2005) embarked on a review of curriculum architecture:

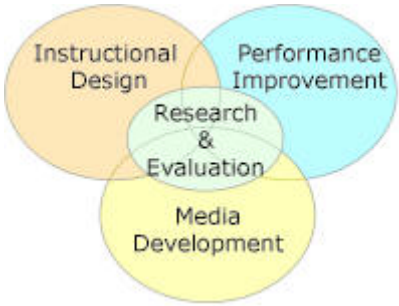
Specific tasks:

- Formulate a recommendation as to what the basic components of the curriculum should be and what proportion of the curriculum each should encompass [i.e. how much of the total curriculum should be allocated to each component? Should there be minimums or maximums set?]
- Consider whether degree requirements should be defined in terms of courses, credits or in some other way
- Make recommendations as to whether course completion should be the sole way in which a curriculum requirement is satisfied or whether there should be multiple ways including, e.g. demonstration of competency through testing, portfolios, *etc*.
- Consider and describe any factors that might pose limitations on curriculum design [at Saint Joseph's University] e.g. number and size of classrooms, scheduling flexibility, faculty workload issues, etc.

The most recent report from St Joseph's (2005) indicates that the debate on curriculum architecture has led to a radical change in the pattern of terms (semesters) and in the distribution of courses and 'credits'. The move from 5 three-credit courses per semester to 4 four-credit courses was for them a "frame-breaker", i.e. a decision which meant thinking 'outside the box' and moving away from traditional structures.

The final bullet point above raises issues which would be of direct relevance to Scottish schools. Decisions by headteachers and local authorities about class size, class composition, accommodation, timetabling and teacher deployment are all central to the implementation of *A Curriculum for Excellence.* However, another perspective on the issue of curriculum architecture is raised by the Engineering department of Boise State University:

"Why do we need a competency-based curriculum architecture?



Our educational goal is to provide quality education to professionals working in the fields of instructional design, performance technology, technology-mediated learning and performance improvement, and other related areas. To accomplish our educational goal, it is critical to have an architecture of curriculum that reflects the current competency standards of the fields and to provide working professionals with education that helps them improve their professional competencies."

In other words, it is not simply the structural issues which are important, but the extent to which the underlying aims of the curriculum are reflected in the pedagogies in classrooms and are consistent with the models of curriculum design which will emerge from *A Curriculum for Excellence.*

Curriculum Architecture has been described as a "hot topic" by the publishers of Hawkins and Graham's (1994) book, *Curriculum Architecture: Creating a Place of Our Own:*

"A refreshing, remarkable, and revealing treatise on the current "hot topic" of curriculum reform awaits readers of *Curriculum Architecture*. This book provides an important, but often overlooked perspective on the business of designing a curriculum for young adolescents. Its central message surfaces frequently — each school must create its own curriculum, based on its own study of its students, its community, its faculty, and with the real involvement of the students themselves. The task is to design 'a place of our own'."

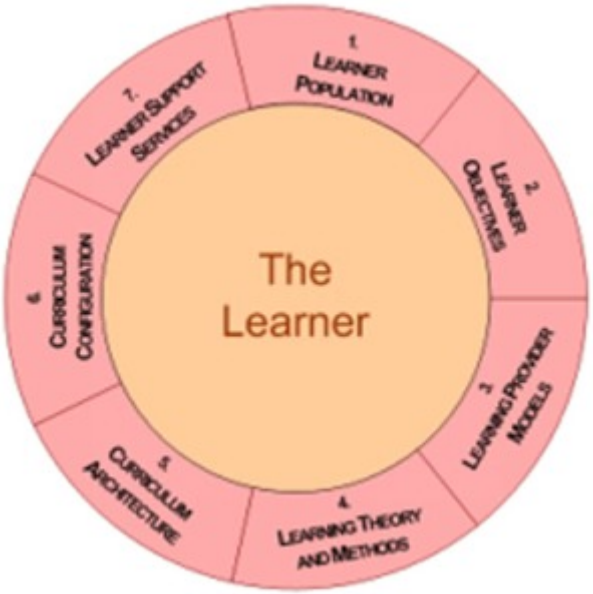
The challenge facing Scotland at present is the balance between what the Minister often refers to as professional trust in teachers to design a curriculum to meet the needs of their pupils within the spirit of *A Curriculum for Excellence* and the need to ensure a measure of consistency within the national system.

Dolence (2006 – http://www.mgdolence.com/resources/ccspm/ccspm.aspx) looks first of all at the "the Learner-Centered Curriculum Approach" and argues that the following steps, among others, need to be taken:

- a comprehensive integration of learning theory, methods and principles appropriate to successful learning;
- a strategic re-conceptualization of the overall curriculum architecture providing a full scope of programs and approaches;

- a synthesis of specific curriculum configurations designed to meet specific learners' needs; and finally
- the design, development and deployment of the array of services required by learners to meet their objectives.

The Learner-Centered Curriculum Approach



He goes on to argue that any discussion on curriculum architecture must take into account the following issues:

- Learner Objectives
- Learning Theories and Methods
- Learner-Centered Curriculum Architecture
- Learner-Centered Curriculum Configuration
- Learner-Centered Support Services.

The impact of any curriculum architecture can be considered in terms of different sub-groups within the pupil population, including gender, ASN, different ethnic and cultural backgrounds, etc. In this regard, the review will take account of some contentious issues such as setting or streaming by prior attainment (TESS, 23.06.06), the representations of these sub-groups within sets and the impact different forms of class organisation may have on the motivation and achievement of these groups. Finally, the literature on size of school and on the deployment of staff in innovative ways will be considered.

It must be acknowledged that the term “curriculum architecture” subsumes, in the Scottish context, a range of issues which do not necessarily add up to a coherent whole. There will be some debate as to the relevant importance of the elements identified in the SEED specification and the extent to which central advice on some of them is seen to be appropriate. The issue of class organization is a good example: it is a crucial issue in the context of curriculum architecture and yet it may well be one on which SEED may not wish to offer advice to local authorities.

3. Early years and primary school

This section will consider the ways in which curriculum architecture has emerged in the early years and primary sectors in Scotland and internationally and its impact on learners, and the level to which the architecture of curriculum outlines its very nature (Hawkins and Graham, 1994). Issues such as the starting age of pre-school provision and its impact on attainment and socialisation; the organisation of this provision in terms of curriculum, staffing, learning environments and organisation of the school day and year; the targets set nationally for attainment and achievement and the impact of these on pedagogy and assessment; transition from pre-school to school; organisation and structure of the curriculum at the primary stage and its relationship to pre-school organisation and structure; class size, composition and deployment of staffing, teaching and support; testing and assessment regimes and use of resulting data; the role of parents in relation to their children's education particularly at the early stages; and, finally, pupil engagement, will be addressed through an investigation of:

- the philosophical background to curriculum architecture
- an overview of international curriculum architecture
- countries that have recently conducted curriculum reviews and the impact, real and potential, on curriculum architecture
- curriculum architecture and an inclusive approach
- features of contemporary curriculum architecture
- the relationship of contemporary curriculum architecture to the reality of contemporary society in the 21st century
- a conceptual framework for curriculum architecture
- the Scottish models

In these ways the capacity for curriculum change offered by particular curriculum designs, frameworks or architectures will be considered in terms of their transformational capital.

Many European countries and USA are reported to have adopted a "readiness for school" approach, leading to a focus on the acquisition of a range of knowledge, skills and dispositions that children ought to develop as a result of classroom experiences, and that lead to promotion of cognitive development. On this model pedagogical approaches have become more teacher-centred and academic (OECD, 2006). In the curriculum 3-18 Ministerial response (2004) a strong statement about how these two stages should be

brought together made a focus on early childhood pedagogy moving up into early primary. This is more in keeping with the approaches revealed in the literature where countries have traditionally followed the social pedagogue model (Nordic and Central European Countries). Here kindergarten is viewed differently- more as a foundation stage for a lifelong approach to learning with a focus on adults "supporting children in their developmental tasks and interests" (OECD, 2006, p.57). Links are promoted in this model between kindergarten, leisure services and primary school, with a philosophy that the kindergarten approaches should influence early primary education, in particular with the development of the 'kindergarten class' – a new class introduced into elementary school for the youngest children – the 6 year olds. In Starting Strong (2001) one of the recommendations was that a more unified approach to learning should be adopted in both systems, recognising the contribution that the early childhood approach brings to fostering key dispositions and attitudes to learning. It is advised that the direction of influence should be from early childhood to school services. In terms of curriculum architecture this will entail increased knowledge between sectors, shared practices, coherent curriculum, the relevance of learning approaches for younger children, such as playful and active learning and modes of teaching.

The domains of knowledge normally adopted in these early curricula include nature and the environment, emergent literacy and numeracy, general knowledge, scientific concepts and reasoning. Of these the areas that receive most focus- especially in countries that adopt child assessments shortly after entry to primary school, are emergent literacy and numeracy. There are other equally strong models - in these models children tend to enter school later – for example in Denmark there is now a bridging class named kindergarten class, for 6-7 year olds, in the year before they enter mandatory schooling. The aim is to take the preschool methods into the primary school system, and these classes are led by an early childhood pedagogue who works alongside the primary teacher. Experiential education in Flanders has influenced an approach, carried on into primary school, of starting from the perspective of the child, with the central aim of ensuring their well-being and involvement in learning – a process investigated in Scotland through research into positive behaviour in the early years (Dunlop *et al*, forthcoming 2006-7). The Starting Strong 11 Report (2006) reiterates its 2001 message that a challenge still exists in many countries to focus more on the child, to develop high quality learning environments and to develop greater understanding of "the specific developmental tasks and learning strategies of young children". This accords with the findings of Stephen's review (2006).

The 2006 Starting Strong report (p.62) discusses the "schoolification" of early childhood education and care in which top-down methods, materials and groupings are applied. This has left a legacy in some countries of structures and practices that would be criticised today as being unsuitable for young children. In designing for a new curriculum architecture, we find that the literature on early childhood and early primary provides considerable evidence for curriculum which identifies domains of knowledge, in balance with the development of skills and dispositions. In Scotland the aspiration for early childhood curricula is that it will introduce "purposeful well-planned play" (SEED, Ministerial Response, 2004): critiques of the Te Whäriki implementation and its relation to early childhood school curricula in New Zealand (Cullen, 1998) highlight the significance of ensuring such a match between the language of documentation and the aspiration of government to create change. The Curriculum Framework 3-5 (1999), widely accepted in Scotland to have promoted appropriate early childhood approaches, included 'development' attached to each of the key areas of learning titles, and safeguarded active learning through experience.

Effective early childhood pedagogy has been described to be at its best when it includes a balance of what the USA Eager to Learn programme describes as a mix of self-directed learning and teacher-directed instruction (Bowman, 2001), including 'shared sustained thinking' (Siraj-Blatchford et al, 2003), and the provision of instructive learning environments to take children's learning forward. Leseman (2002) argues that the most lasting effects of early childhood programmes are realised when socio-emotional and cognitive approaches are integrated. This view does not contradict the social pedagogy perspectives described from the Nordic countries, however this tradition also aims to increase children's agency in the interests of more holistic aims for early childhood practice.

The Delors Report (Delors, 1996) proposed general goals for education in the 21st century. Applied to early childhood preschool and primary school settings it is possible to envisage early childhood education as a form of citizenship in itself. The broad goals were – learning to be, learning to do, learning to learn and learning to live together. Placing such goals at the heart of early childhood education means fostering experiential, self-regulated and self-motivated learning. Starting Strong 11 claims this requires "a practice that puts children's participation at the centre of the curriculum, and calls for the specific training of early childhood educators in the competences that allow this to happen." (p.127)

There are a number of ways in which quality may be defined and regulated in early childhood services. Orientation quality, structural quality, educational concept and practice, interaction or process quality, operational quality, child outcomes quality, parent/community

outreach and involvement are all commonly included in any overview of quality of provision – though some of these aspects are contested in some countries. For example, in New Zealand the “readiness for school” approach is resisted as it leads to statements of the knowledge and skills that children should acquire before school – Carr (2001a, 2001b, 2004a) and others see this as a deficit approach which leads to a focus on what children cannot do, rather than on their competence. In a socio-cultural perspective, Carr (2004b) sees that in the assessment of young children it is possible to develop what she describes as an ‘identity referenced’ assessment practice that-

- keeps the learning distributed across people, places and things - the teachers, the activity and its purpose, the tools and the discursive practices.
- provides an account that the learner and family can re-visit.
- encourages children and families to be involved in assessments: writing or telling their own stories. They widen the community of learners that is constructing identities, and
- invites children to assess their own learning

In this approach a ‘learning story’ approach is adopted and children develop portfolios of their own early learning, with teacher and parent contributions. A clear emphasis is placed on children’s competence. In Sweden formal assessment is seen as unsuitable for young children, here they prefer to evaluate the centre, rather than assess the child, nor are children assessed in early primary school (Martin-Korpi, 2005). Claxton and Carr (2004) propose a dispositional framework for early childhood teaching and learning: the implications of early childhood approaches for later schooling insist on a complex linking of early childhood and primary frameworks in the aspirational context of A Curriculum for Excellence.

In a report on reform of education in Lithuania a number of insights from the first ten years of reform are shared- the process emphasised was one of consultation, on the basis that reform will only occur if teachers implement it, and for them to do so, they must feel they had participated in the development of the new curriculum – here a curriculum driven reform is seen as preferable to an assessment driven reform. Budiene (2001) defines the basic aim of pre-school education as being to assist in the development of a child’s personality and impart the fundamental skills needed for life in society. Building on this, the general aim of primary schools is to prepare for the development of an educated, independent and active personality. It seeks to do so by the following means:

- creating conditions conducive to the growth of each child's individuality;
- imparting the basics of culture (intellectual, aesthetic, ethical);
- imparting knowledge and fostering the ability to analyse and interpret it;
- developing all ways of acquiring learning that are relevant to a person's life and his or her relations with society at large.

International evidence (Arnold, Bartlett, Gowani, and Merali, R, 2006) suggests that better supports are needed in the early stages of primary schools to ensure the relevance and overall quality of children's experience. Substantial knowledge and experience is available on how best to support young children's learning and development (Abadzi, 2006) and it is argued that this knowledge is informative for curriculum design. Certain key ideas permeate the literature whether it is focused globally or more locally – smaller classes, inclusive environments, more active learning opportunities, a strong emphasis on building language skills and reading abilities across all subject areas and more active learning strategies directly linked to curriculum aims rather than as "add-ons". Alongside these practical issues sits the need for experienced and capable early childhood teachers, support for teachers in practical ways to help children enjoy their learning, specific professional development for those that are responsible for the work of early years primary teachers, deepening early primary teachers' knowledge about how young children learn, and a focused building on from early childhood services' success in involving parents and caregivers.

In summary, research evidence suggests that a more unified approach should be taken towards early childhood education and the primary school system. The topic of transition into school, and from primary to secondary education is addressed more fully later in this review. Given the aim of this section to look at both early childhood education, early primary education and primary schooling we acknowledge the research into transitions and conclude that transitions are important and challenging for children as they enter primary school, but a "readiness for school" approach to teaching and learning may undermine children's involvement, confidence, competence and well-being and mitigate against the development of self-regulation, motivation and identity as learners.

3.1 Organisation and structure of the curriculum.

This section addresses a range of issues around organisation and structure of the curriculum at the early childhood and primary stage, including evidence where it is available in the literature on composition and deployment of staffing; teaching and support, teaching methods and learning styles, continuing professional development, parental participation,

class size, integration or separation of subjects, characteristics of effective early tears and primary curricula and policies, organisation including grouping, collaborative learning, effects of different kinds of groups, and ICT/digital technologies and their impact on curriculum structures. The search of the literature revealed studies addressing some of these aspects, and also writings supported by the literature that are more in the nature of opinion pieces written by experienced researchers or reviewers.

3.2 *Staffing*

The climate of early childhood services emphasises integrated services and new models of provision for young children. A SEED working group including representation from HMIE and the SEED Early Education and Childcare Division (Scottish Executive, 2002) considered the role and contribution of teachers in early education. They concluded that a much clearer focus on the nature of the educational enterprise at the pre-school stage is emerging, and that in this climate it would be important to draw advantage from the full range of staff skills evident in early years services. The importance of including teachers in this workforce was endorsed, but the roles they might take on, and the ways in which each member of a diverse workforce might contribute to social inclusion, lifelong learning and enhancing the quality of children's experience is open to re-definition. Subsequent developments culminating in the current review of the early years workforce (SEED, 2006b) promise to take this agenda about staffing early childhood services forward. A review that considers all contributors to that workforce together, has so far been elusive.

The Menzies Report sets out to make the case for educational reform in Australia- stating that a 21st century system needs to be different from the 19th century model which dominates education. In proposing policy change 6 aims are identified- these are quality, equity, choice, autonomy, efficiency and accountability. The aspiration is that there will still be 'a place called school', but that this will be transformed by creative leadership: transformation is inevitable. For this to be achieved the Menzies Report (Caldwell and Roskam, 2002) emphasises that schools must meet the needs of all students and the work of the teacher in the classroom must be supported by encouraging school self-management so allowing teachers to use their professional skills in order for their approaches to become more creative and at the same time more fulfilling.

3.3 Teaching methods and learning styles

Teaching methods are influenced by the teacher's own preferred learning style (Le Métais et al, 2001) and by his/her ability to adopt alternative styles to meet the needs of the pupils: a

new focus on curriculum aims will make demands on teachers to develop a range of methods, to be differentiated according to the needs of their pupils.

3.4 Continuing professional development

Teacher professional development programmes are found to be an essential element in implementation of curriculum (Le Métais et al, 2001). Engagement with new approaches may be fostered by good learning materials and training, thus supporting teachers to provide a wider range of learning experiences to support their pupils' learning and/or consolidation and to support the transfer of learning across subject boundaries.

In a case study of teacher engagement with published materials, Givens (2000) asserts that curriculum materials have been one of the mechanisms to promote curriculum change: herein lies a paradox in that whilst guidelines are produced, schools and teachers are to be encouraged to exercise more responsibility in developing curriculum from the guidelines. Applying this to teacher CPD. Givens' citation of Kelly 'there is no curriculum development without teacher development' is interesting- conversely he claims there can be teacher development based on resources, but that teachers may engage only on their own terms. This is a challenge of curriculum change that accentuates the needs and possibilities of CPD.

3.5 Parental involvement

Casanova (1996, 30) states that 'the value of parental involvement has become an acceptable truism'; however, failures to involve parents successfully continue and can mitigate against the inclusion of the very groups that education policy most aspires to involve. Such groups include parents who do not readily relate to the culture of the school as they find it too distanced from their own and who do not fit with the normalisation model of parental involvement which may be dominant in schools (Edwards & Warin, 1999). For parental involvement to work positively for children, parent dispositions need to be taken into account, and opportunities for parents to define for themselves what is an appropriate parental role for them to play at transition and beyond into primary school, are necessary (Vincent & Tomlinson, 1997).

Parental role may be seen differently in different settings and at different stages of education: this makes for discontinuity for parents: sometimes invited and expected to participate, sometimes not, this can cause parents to feel less and less needed by the children and their teachers, so they may experience a role shift themselves. Decisions about becoming involved reflect various typologies, for example Pugh's range from non-

participation to parents running the pre-school provision themselves (1987), whilst Hoover-Dempsey & Sandler (1997) identify 5 levels starting with parents' basic involvement decisions through to the effects of their involvement on child outcomes. There is ample evidence that such involvement is welcomed by many parents, as it enhances their children's involvement in learning and thereby their attainment (Dyson & Robson, 1999). Parents' perceptions of the general invitations, demands and opportunities for involvement presented by children and their schools could lead to a shared agenda for parents, teachers and children and provide the starting points for an active policy of including parents at points of transition, and through their agency, sustaining and developing a mutual view of why parental involvement matters. As with school pupils, parents need to feel familiar with the setting, have time to develop relationships, experience curriculum involvement and interpretation- so they may not only know what their child is experiencing, but may be able to contribute prospectively, and be included in educationally active ways (Dunlop, 2003).

Although systemic reform seems to be a broadly accepted framework for educational change, concrete reform projects still face the uncertainty of how to meet the necessary requirements. A paper by Gellert (2005) considers the case of a curriculum reform process in primary mathematics education that has a focus on the involvement and influence of parents. The data consists of a short address to the parents which introduces them to the new concept of active-explorative learning and allocated a specific role to parents within the process of change. By means of discourse analysis and the sociological ideas of exclusion/inclusion, autonomy, and expert/ non-technical discourse, the long-term consequences of the social role assigned to parents in the programme is discussed. Gellert concludes that it is essential to include parents in new developments in content and pedagogical knowledge, otherwise a field of professional expertise is created that develops terminology and a knowledge base which excludes parents as active agents in the reform process and positions the parent conservatism towards educational reform as a self-fulfilling prophecy.

3.6 Class Sizes

The existing literature review of class size undertaken in Scotland in 2001 was updated in 2006, and concludes that in a climate of sustaining improvement in schools the effects of class size are part of a wider picture. The report concludes

> "though most researchers agree that there is a relationship between small classes, especially in the early years, and pupil attainment, many accept that this is only part of a complex picture. Classroom processes, the quality of

> teaching, the prior attainment of the child and parental background, are all likely to contribute. Other researchers, while accepting that class sizes should be reduced, claim that there are more cost-effective ways of providing young children with individualized attention when they most need it. Class size reduction is attractive because it maintains the existing structure of schools while simply adding more resources. This may be a necessary step, but there is no evidence that in the long-term it will be sufficient to raise the attainment of all pupils." (Wilson, 2006, p 104)

As class size is however acknowledged to be a contributory factor in school success, for the purposes of this review we refer the reader to the Class Sizes, Staffing And Resources Working Group: Interim Report (SEED, 2006c) and to two studies of interest that were not included in that report. We found, as did the Working Group, that there is no Scottish data reported.

Pedder (2006) takes account of two UK class size reviews and quantitative, qualitative and mixed method class size research in this investigation of the complex relationships between class size and the effects on pupil learning. The paper presents a conceptual framework offering three inter-related models developed on the basis of 30 years of classroom research into effective teaching and learning and making use of reviews of class size research. For Pedder (2006) some previous large scale research projects in the United Kingdom have depended on bivariate analysis of class size on learning outcomes and do not incorporate the classroom processes which might be factors in mediating class size effects on learning. His review of Blatchford's (2003) Class Size and Pupil Adult Ration (CSPAR) project, a three year long investigation of 10,000 children in the first four years of primary schooling, identifies several aspects of classrooms and classroom processes which are part of the 'class size-pupil learning' inter-relationship:

- physical space
- grouping practices;
- establishment of routines;
- classroom discipline;
- tasks and the curriculum;
- teacher-pupil interaction and knowledge of children;
- teacher stress and enthusiasm;
- atmosphere/ethos;

- assessment and record keeping;
- pupil adjustment and peer relations;
- relationships with parents;
- special educational needs.

Three models are presented on the basis of the primary research described above and a secondary research project on class sizes:

1. Variations in class size have an impact on pupil attainment by influencing the freedom with which teachers and pupils can choose from their repertoires of strategies which maximise the quantity of learning opportunities.
2. Variations in class size can have an impact on pupil attainment by influencing the freedom with which teachers and pupils can choose from their repertoires of strategies which maximise the quality of learning opportunities. In so far as teachers and pupils take advantage of the increased opportunities which both larger and smaller classes offer, and minimise the constraints that can arise in both small and large classes, pupil attainments are likely to be increased.
3. As class size increases, teachers and pupils respond to prevailing time constraints by adopting strategies which have differentially negative effects on the quality of and quantity of learning opportunities for different pupils.

In conclusion it is argued that classroom-based research is a useful way of accessing pupils' perspectives and experiences of classroom learning and that understanding teacher and pupil expertise in promoting opportunities for high quality learning in a range of large and small class contexts is an under-researched area.

Woessmann and West (2006) provide evidence on the effects of class size on student performance in 11 countries by examining school fixed effects and instrumental variables. In posing the question as to whether there are sizable class-size effects in educational production Woessmann and West make use of comparable estimates in relation to mathematics and science test scores for a diverse set of countries – Belgium, Canada, Czech Republic, France, Greece, Iceland, Portugal, Romania, Singapore, Slovenia and Spain. The analysis of the data gathered indicates that there is variability in the results which depends on the school system but that a pattern is discernible which relates to the quality of the teaching force: class-size effects and poor performance relate more significantly to low average capability of teachers. US research literature is cited as

confirmation of these findings and the authors of the paper offer a speculative conclusion that limited resources may be more effectively deployed to employ more capable teachers rather than reducing class sizes.

3.7 Integration or separation of subjects

Within subject integration has been strong in Scotland despite the emphasis on the discreteness of the main curriculum areas advocated in recent years as a means of ensuring all aspects of curriculum were appropriately addressed. For example, separate programmes of learning for the constituent subjects within Environmental Studies (Scotland) differentiate between history, geography, science, social studies, and technology. It is only the '*development of informed attitudes'* that obviously transcends the boundaries. Insofar as primary school teachers are generalists (Métais et al, 2001), different subject strands may be drawn together through integrated, project based work. In fact, some curriculum documents explicitly cross-refer to related topics in other subject areas. However, as the subject matter becomes more complex (usually at secondary school level) specialist teachers take over, and the degree of informal integration may be lost. As 3-18 curriculum becomes defined, teachers may appreciate support to integrate learning in the spirit of the initial report from the Curriculum Review Group: "There should be clear links between the different aspects of young people's learning, including opportunities for extended activities which draw different strands of learning together." (p.15 *A Curriculum for Excellence* The Curriculum Review Group,2004)

3.8 Characteristics of Effective Early Years / Primary Curricula and Policies

Two DfES-funded research projects are reported by Siraj-Blatchford and Sylva (2004) offering findings based on large-scale, longitudinal data collection procedures which incorporate quantitative and qualitative case study investigations of pre-school pedagogies in 14 Foundation stage settings. Five particular areas are the subject of the report on findings: sustained shared thinking; diversity and differentiation; discipline; indoor space and home educational provision. The researchers conclude that the following elements are significant.

- Young children require direct and immediate experiences in order derive meaning based on previous experiences and that very young children must be provided with opportunities to take the initiative to learn actively. The most effective pedagogy is based on a physical and intellectual environment which has adult awareness of the

child's understanding, the child's awareness of what is to be learned and an active co-construction of an idea and skill.

- There is a requirement that the adult in this learning relationship has a sense of the child's unaided capability so that the appropriate support can be offered to move to a confident and independent performance of the learning by the child as the adult reduces the support.
- This has an impact on the provision of the kind of environment which offers the cognitive challenge to the child within a zone of proximal development. However, modelling, demonstration and explanations should also be available to exploit the environment chosen so that the activity is effective in leading to learning.
- In situations where such carefully planned and sustained experiences were not made available to very young learners in pre-school settings positive outcomes could be discerned and were explained in relation to the cultural context of the home.

Stephen (2006) offers an international literature review of print, electronic and grey material available since 1995 to address questions about the kind of educational experiences offered in early childhood; evidence of the impact of such education; whether this is a distinct phase; how decisions are made about the timing of particular educational experiences. The following conclusions are drawn from the international literature review:

- three to six years of age emerges as a distinct phase;
- cultural and socio-political conditions in society lead to variation in the features and expectations of early education;
- disadvantaged children are viewed as gaining support from early years interventions;
- cognitive and social/behavioural development and academic attainment and social behaviour in the first years of schooling can be enhanced by early years education;
- the elements crucial to learning in the early years are holistic views of learning and the learner, active or experiential learning, respect for self motivating behaviour of children and responsiveness in interactions between children and adults;
- transitions between early years and primary phases need careful consideration of children's needs, readiness and introduction to the next stage, consistency of pedagogical approaches.

3.9 ICT/Digital Technologies & Impact on Curriculum Structures

In a study of teacher use of ICT to support powerful learning environments within the highest grades of primary education Smeets (2004) used responses from 331 questionnaires to interrogate how active, autonomous and co-operative learning is stimulated. Four particular characteristics of powerful learning environments are distinguished: the presentation of rich contexts and authentic tasks; the stimulation of active and autonomous learning; co-operative learning; adaptation of the curriculum to the needs and capabilities of individual pupils. In relation to the contribution made by ICT Smeets (2004) identifies a positive valuing by teachers of the potential of ICT but has concerns that skills-based applications are emphasised over open-ended ICT applications. Whereas more open-ended applications may support co-operative learning and bridge school learning to 'real world' understanding, this type of ICT usage is limited. Though ICT might offer opportunities for curriculum differentiation for high-achieving pupils it was remediating tasks which were employed in teacher exploitation of ICT potential. In summary computers are used to complement and not to change existing pedagogical practice. Those teachers who were more confident about their skills or in schools with easy availability and sufficient numbers of computers were more likely to use ICT to optimise learning environments.

Le Métais et al's paper on school differences across the UK (2001) provides insight into what is different about Scottish education rather than the UK as a whole. The paper is the outcome of a commission from the BBC to conduct an analysis of the curriculum requirements for the period of compulsory education in the four nations (England, Northern Ireland, Scotland and Wales. Le Métais highlights language, national history and culture, and makes a case for the production of interactive digital teaching materials that are inclusive of the cultures of the four nations of the UK. In Scotland, schools may embed ICT across the curriculum or use part of the school's flexible curriculum time.

3.10 Organisation of Learners

This section looks at issues concerning the organisation of learners, including the impact of classroom design and organisation, grouping practices, interdisciplinary teaching, personalised learning/ differentiation/ flexible curriculum, and pupil motivation and identity. The OECD thematic review, Starting Strong 11 (OECD, 2006), added a further 8 countries to the 12 originally reviewed in the first Starting Strong Report (OECD, 2001). A range of findings on the organisation of learners and classroom practices are presented and discussed. The report refers to " the pre-primary approach to early education" (p63) found in

many countries, e.g. Australia, Canada, France, the Netherlands, United States and UK, and says “these countries tend to introduce the contents and methods of primary schooling into early education, or, as in the case of the United Kingdom, begin school at the age of 5 years.” (p 63).

The “standards based model found in the US sets out a range of knowledge, skills and dispositions that children are expected to develop as a result of classroom experiences, and focus increasingly on knowledge and skills useful for school.” (p 63) That is literacy, numeracy, science- programmes tend to articulate what children should know as the outcome of participating in pre-school programmes. By contrast the pre-school class run by the Ministry of Education for 6 and 7 year olds is characterised by “ concrete experimentation, children’s own investigation, playful activities, imagination, interaction, drama, active participation, information acquisition, problem solving and reflection” (Sinko, 2006) Finnish primary education as a whole embraces a socio-constructivist model of learning in which it is deemed essential that children are active participants, and for whom “there is no grading or ranking of children.” (OECD, 2006, p 64). Finland is currently a top ranking country in the PISA 2003 (OECD, 2006) round of country assessment in mathematics, and holds the international lead in literacy as well.

3.11 Classroom design & organisation

Attention to classroom design and organisation is not new. Dewey (1966) made clear that the mature control the kind of education the immature receive through the control of the environment in which they act (and think and feel). He asserted that there is a difference between ‘by chance’ environments and those that are designed for the purpose. Malaguzzi’s (1993) impressive development of the Reggio Emilia schools was predicated on the concept of the environment as the first teacher. Dunlop’s (2004) work on contrasts between early learning environments in preschool and school, supports this idea of difference and posits that an essential element of promoting links across the curriculum is to provide environments at points of transition that are more similar than different. Her study of 150 children in transition from early childhood education to primary school used the ECERS (Early Childhood Environment Rating Scales) (Harms, Clifford and Cryer, 1998) in both sectors and found both positive and negative relationships between the qualities of environments experienced by children either side of transition. In this and other areas a range of studies and practices reinforce the importance of child/pupil participation in curriculum development through consultation (Kinney and McCabe, 2001), pupil voice (Slatter and Cremlin, 2005) and emotional literacy (Beeson, Savage and Jones, 2005. Chelms, 2005), children’s

preferences: all using participatory techniques (Clark and Moss, 2001. Dixon, 2004) and viewing even young children as experts in their own lives.

When considering continuities between kindergarten and school the Starting Strong 11 report (2006) noted that in Canada, Denmark Finland and Norway, Sweden and USA the first classes in primary schools often had furniture and resources that were familiar to preschool and kindergarten children. An adapted curriculum and pedagogy was also observed. In some countries a specific focus was made on learning areas that would then carry over into primary school. Almost all countries reviewed in Starting Strong 11 have published curriculum or advice on learning areas and domains of knowledge for children aged 4 to 6 years old.

Their findings suggest that in many countries, the natural learning strategies of young children are not always reflected in classroom practice. Play, exploration out of doors, and within classroom peer exchange, relations and discussion and with other children, are not always encouraged. The Report espouses the importance of children's agency in the learning process and found that, for example, Canada, Norway, Finland and US frequently had furniture and materials familiar to the starting children.

Weikart et al (2003) found that small classrooms with ratios of more than 20 children with one adult, with a more prescriptive curriculum, inevitably lead to difficulties for early educators attempting to introduce a more play-based and inter-relational curriculum in which children experience choice, some sense of their own agency and are able to pursue their own interests and learning agendas.

3.12 Grouping for teaching and learning

No two classes are the same and schools differ in the extent to which they (are able to) create homogenous teaching groups. Class teachers benefit from well indexed, modular materials that facilitate access by teachers and learners so that the repertoire of whole-class, group, or individual learning, as well as individual remedial and extension work may be undertaken. Setting in language and maths has become increasingly common in Scottish primary schools. Differentiation and accessibility become all the more important when working with heterogeneous rather than homogenous teaching groups (Métais et al, 2001).

3.13 Grouping practices

Hallam, Ireson and Davies (2004) undertook a study of a range of grouping practices utilised in six primary schools in order explore the perceptions of primary-aged pupils regarding

various aspects of ability grouping. Six pupils from each case study school who had been rated as representing high, moderate or low ability, mixed gender, were interviewed. The schools had been chosen on the basis of OFSTED and local education authorities' characterisation of having effective or innovative ability grouping practices. In the semi structured interviews pupils were asked to respond to questions about the attitudes to school and their views on the grouping practices used in their schools. Transcribed data were coded using a seven stage process.
The findings reveal that:

- pupils were aware of the grouping structures in their schools;
- the role of national testing as a factor in the adoption of procedures was understood by pupils;
- pupils were aware of the differences in work being tackled in different sets
- pupils regarded the purpose of setting to be to match work to student needs;
- there were advantages in understanding the work and the pace of work in terms of matching work to needs;
- the main disadvantage was the stigmatisation and teasing when pupils were in ability sets;
- pupils disliked being separated from friends and finding work was too easy or experiencing top stream pressure.

From pupil perspectives behaviour was an important issue in relation to grouping and it was understood that manipulation of groupings, including gender groupings, was undertaken to reduce class conflict and promote good working relationships. Pupils' preferences for changing groupings related to having harder work or easier work or to stay or move because of friendships or to have a range of different teachers.

Mixed ability teaching was perceived to provide good support for learning though sometimes this caused resentment. In the experience of pupils interviewed structured ability groupings made them aware of the differences between them and legitimised differential treatment. None of the pupils gave reasons for liking or disliking school in relation to ability grouping practices.

Hastings and Chantry Wood (2002) argue that primary classroom organisation, particularly in respect of group seating, should be responsive flexibly and strategically to support children's learning. In is their contention on the basis of a number of studies that the

standard seating arrangement in primary classrooms is not justifiable in terms of the proportion of teacher and children time engaged in small group teaching. Again taking evidence from a range of studies Hastings and Chantry Wood (2002) make the proposal that collaborative group work is less evident in practice than would merit this seating arrangement being employed so consistently in primary classrooms. In considering two further justifications - ability grouping advantages and ease of access to resources - as reasons for the organisation of classrooms into group seating the researchers dismiss the arguments rehearsed by practitioners. In contrast this paper offers observational study evidence that sitting in groups has detrimental effects on attention and that the physical environment should be changed to suit the activities being undertaken and that there should be no standard configurations.

Macintyre and Ireson (2002) report findings of a study examining within-class grouping for mathematics in six classes in one primary school to investigate whether ability group placement was consistent with ability and the ascertain the impact of their group placement on pupil mathematics self-concepts. The sample consisted of 145 children in years 3 to 5. Results of standardised tests, self-concept measurements, teacher information and interviews with 7 children were used to identify correlations between mathematics ability and mathematics self-concept.

The findings confirm suggestions from previous research that within-class ability grouping may limit children's learning in so far that misplacements in within-class and across-class groups is a significant phenomenon. Furthermore it is indicated that groupings affect self-concept which influences children's achievement. There was imperfect correspondence between mathematics ability scores and placement in mathematics ability group. Though teachers are reported as viewing ability as changeable to some extent there was little evidence of changes in the ability groupings, perhaps due to time pressure and social considerations. Differences in the quality of work planned for different ability groups and in the quantity of work completed are also reported leading to limitation of pupils' achievements.

Whitburn (2001) uses results of tests administered between September 1997 and March 2000 with 14,000 primary pupils in England to investigate the effects on attainment of setting by attainment compared with mixed ability teaching. The project focussed on pupils in the lower years of Key Stage 2. At the point of reporting further data was expected to allow comparison of the progress of children at later stages from the two cohorts of set and mixed ability classes. Whitburn (2001) finds no discernible benefits of placing children in sets for

teaching mathematics but avers that children should be able to continue to have the social and equitable benefits derived from mixed ability teaching. The findings reported apply to three different cohorts which indicates confirmation that the proposal is sound. However, it is argued that the particular pedagogical approaches employed in the project from which the study was conducted may have had an impact on the results of the data analyses. The significance of whole-class interactive teaching in the national Numeracy Framework suggests that it is important to understand the effects of different organisational approaches to teaching.

3.14 Interdisciplinary teaching

Akins and Akerson (2002) report on an American action research study involving one elementary school teacher in which the purpose was to evaluate how well differences and connections between language arts, science and social studies might be made for 26 ten year old pupils. The strategies employed during the investigation were student interviews, observer logs, journal notes, 'connection' journals, student work and a teacher record and planning book. Three trends were observed:

- pupils demonstrated awareness of the connections between language arts and science, language arts and social studies but not science and social studies;
- exposure to the nature of the disciplines increased so did their ability to connect the three subjects but not between science and social studies;
- success rates of pupils meeting the objectives of the content was higher when interest was high and real-life applications were evident.

The study seems to support existing research on interdisciplinary curriculum that pupils require an understanding of the nature of various subjects before conceptual connections become clear and real-life applications are made.

3.15 Personalised learning/ differentiation/ flexible curriculum

The paper prepared by McGarvey *et al* (1997) accesses views of head teachers, subject co-ordinators and teachers across a range of primary schools in Northern Ireland through questionnaire responses and case studies. It is concerned with how differentiation is planned and responsibilities for differentiation assigned and the approaches used in classwork and homework. The research was carried out in three phases – initially using a convenience sample of 14 primary schools and interviews with 5 primary school advisers;

second phase comprising focussed questionnaires to 855 participants from 4 groups of head teachers, subject co-ordinators, teachers and curriculum support staff; finally case studies involving semi structured interviews and observations in 7 primary schools with 20 teachers.

Good practice in differentiation was found to have the following characteristics:

- identifying children's needs and matching tasks;
- good planning, well-prepared resources, good classroom management, flexible grouping;
- fostering pupils' self esteem, motivation and interest and enabling pupils to work at an appropriate rate and level which allows time to grasp concepts.

Negative aspects include:

- shortage of time to plan, prepare and teach;
- labelling lower attainers when forming groups.

Additional findings are reported:

- clearer definitions of differentiation grounded in realistic action are important;
- collaborative approaches in schools support success;
- while teachers aim for progression and continuity they may not provide sufficient challenge or flexibility to cater for the range of needs;
- homework was more often the means of differentiating rather than in classwork;
- there are risks that the needs of individuals in groups may be neglected;
- though planning for differentiation may be well supported but teachers experienced difficulties in sustaining the approaches.

Raveaud (2005) considers differentiation by task as influenced by national context in French and English primary schools. The research strategy was classroom observation using a sample of 12 classes in socially disadvantaged areas from a variety of geographic settings. The focus is on the teachers' practice, values and beliefs as the aim is to relate classroom practice to the cultural setting in which it takes place. Raveaud's (2005) proposition is that teachers' justifications for their differentiation practices rest on culturally embedded views of learning as a collective or individual activity. Contrasts in understanding of the concept and its underlying rationale as well as in practice are suggested in this paper and these contrasts indicate the cultural constructions of the pupil. In France the pupil is a social being, a member of a class, entitled to the same learning as peers and a future citizen with equality of

opportunity; in England the pupil is viewed as an individual whose aptitudes, difficulties and needs require recognition and to be taken into account to develop full potential at the individual's own pace.

3.16 Pupil motivation

The psychological literature is a rich source of insight into motivations to learn. McLean (2004) draws on this literature and his own research and practice to consider the relationship between a political aim to raise achievement, and the personal motivation of pupils. In his textbook he claims that "the most powerful motivation comes from the inside" (page xv) in the form of self-motivation. McLean proposes that pupils need motivated teachers, that classrooms and schools can shape and impact on motivation, and that there are four important 'drivers' that affect pupils' mindsets – engagement, structure, stimulation, and feedback. These drivers occur along a relationship dimension, and a power dimension. Engagement and feedback are linked to relationships, whilst structure and stimulation combine in the power dimension. The intersection of these two dimensions leads to four forms of classroom learning context: undemanding, destructive, exposing and motivating. McLean highlights certain key features of the motivating classroom- the optimum environment for learning- as "trust, autonomy, a climate of self-improvement, clarity of purpose and encouragement." (pxv). Useful links are made between motivating pupils and motivated teachers, with an emphasis placed on enhancing forms of leadership: an aim of moving from a control culture to a focus on self-motivation.

Pollard & Flier (1996, 306) point out that 'identities form in a spiralling process throughout life'. Identity can be described as who or what a person is, whilst status embraces the standing or position held within the group. Young children exchange their identity as a pre-school child for becoming a school pupil. Their status changes from being intimately involved with others, often in quite small groups where activities are negotiated with adults, to being part of a large, bustling classroom where one teacher is in control of the programme often with very little negotiation or contribution from the child. Children going through the discontinuities that are inherent in transition, vary in how they feel in school and in their capacity to take advantage of the new experience (Broström, 2003).

James, Connolly, Dunning and Elliot (2006) worked with eighteen successful primary schools all of which served socially and economically disadvantaged areas and communities in Wales. They examine the key features that make for primary school effectiveness, their research emphasises 'the primary task' (p.172) and how this is arrived at, ideas about the

school culture, the time key members of staff had been in post, the normative nature of effectiveness, passion and mindsets that produce effective and enriched teaching, attention to classroom processes and the importance of both leadership and management. They conclude that these are ordinary schools that had incorporated change into sound ways of working, attending well to the basics, " – all the basics – were attended to consistently and properly and, as appropriate , changed to improve the pupils' learning. And that is what seemed to count." (p.178)

A number of schools in US now designate a member of staff to take 'curriculum architect' responsibility. There is a commitment to developing the school's approach to curriculum implementation, in keeping with Local and National Learning Standards, but by exercising professional autonomy and responsibility and adopting a distributed team approach. In the case of the school linked to Columbia University, a large scale blueprint for curriculum is developed with school wide goals, unifying themes, concepts, units and topics (Lang, 2006).

3.17 Impact on pupils in general and by sub-group

The review of the literature allows some insight into emphases on various sub groups of pupils. In particular, disadvantage and diversity, additional support needs and inclusion and gender are addressed:

3.18 Disadvantage and diversity

Karsten (2006) acknowledges that programmes in USA, England, Australia, Netherlands, France, Belgium, Portugal, Greece and Romania operate positive discrimination with a core of policies to combat educational disadvantage. The paper utilises literature reviewing of evaluations and studies of these programmes. In the conclusions section of the paper Karsten (2006) finds similarities in approaches and similar lack of results. Three particular areas identified are in the choice of beneficiaries, choice of activities and evaluation and accountability.

As regards the effects of pre-school and early years programmes there is reason for concluding that:

- positive effects can be detected on intelligence and long term effects on attainment, non-promotion, referral to special schools and socialisation;
- a bigger effect on girls than on boys;

- the narrower the gap between home environment and programme, regardless of the kind of home environment, the greater the effect;
- intensive training in the first three years of primary school is equal in effect to the most effective pre-school programme;
- the extent of the effect depends on the type of programme.

In taking consideration of factors beyond programmes to counteract economic disadvantage the following are the outcomes reported:

- important questions remain as to the effectiveness of reducing class sizes though there is some evidence that disadvantaged children may benefit;
- in terms of the structure of the school year and extensions to time spent at school it is suggested that children in lower income families cannot maintain skills learned at school in home situations;
- area-based approaches require other local measures to facilitate good-quality housing and mixed communities, job creation and good after-school care, business community involvement.

Oyler (1996) reports the usefulness of the classroom meeting as a strategy to promote the practice of shared authority which was maintained through interactions. Children moved from object to subject: this realised the goal of moving through Erikson's industry-inferiority conflict arriving at increased empowerment, defined as "processes and outcomes whereby participants in a situation gain greater access to, and control over, resources and their lives" (p.58). The study concludes that these were empowering processes rather than empowering outcomes.

The issue of diversity in early childhood services is highlighted by Barnett et al (2004). In countries where universal early childhood education has not yet been established, different sub-groups of children may become marginalised. In US Headstart programmes miss most poor children and children whose families are on low incomes but where these are just above the subsidised services line. Across Europe the access of Roma children to education is uneven, and in England Brooker (2002) finds that primary schools still struggle to take account of the different ethnic backgrounds of school entrants. Starting Strong (OECD 2001) noted that the inclusion of children with additional needs in early childhood education can still be difficult. Features of successful inclusion of this group requires specialised personnel, ease of access, responsive pedagogical approaches for example more intensive team

planning, and more focus on staff responding to individual need. Many countries implement individualised educational plans in cooperation with children, parents and teachers. A parallel exists between what is required for children with special needs and those whose additional needs arise from low socio-economic backgrounds. Here too a differently focused pedagogical approach, outreach work into the community, and good staff resource may contribute to improved outcomes. There is evidence from the OECD PISA (OECD 2001-2004) study that the gap between children from under-privileged circumstances maybe accentuated rather than reduced. Australia, Canada, Finland and Japan provide examples of countries which manage to compensate for socio-economic disadvantage so that such children do not "fall irretrievably behind" (OECD, 2006). Evidence suggests programmes that offer intensive early intervention and continue this into primary school have the highest long term effects and the best chance of mitigating against poverty (Brooks-Gunn and Duncan, 1997. Brooks-Gunn, 2003). The evaluation of the Sure Start Local Programmes (NESS, 2005) is not so encouraging.

3.19 Additional Needs and Inclusion

In keeping with current Scottish legislation of a presumption of mainstream education for all it is becoming increasingly common for children with additional needs to be included in environments with typically developing children. Inclusive models of education make new demands on curriculum design. Teachers are encouraged to reflect on the learning environments they offer, and to reflect on how approaches and environments may need to be adapted to facilitate the inclusion of children and young people with additional support needs. In *The Literature Review of Curriculum Change* (Dunlop and Boyd, 2006) one of the main drivers of successful curriculum reform evidenced in the literature is the potential and power of continuing professional development. Preparing professionals to engage in the complex process of inclusion presents particular challenges in CPD, and for curriculum architects espousing an inclusive model of education. Inclusion involves teamwork with professionals from a range of disciplines, new styles of working with parents, and the capacity to work with an evolving cycle of concerns and priorities, rather than adopting predictable route through curriculum. Not all the practitioners involved will be used to working in regular early childhood and early primary classrooms – other settings foster inclusion, but it is classrooms that are a current focus for change. There is an onus on mainstream education to meet a range of needs by adapting pedagogy, curriculum and environments in response to the individual and with the support of specialist advice. Such a blended approach to inclusion is supported by the work of Kontos and Diamond (1997) who, through a study investigating leadership in inclusionary practices, find that such blended approaches require different preparation. They highlight a CPD approach that models

inclusionary philosophy, attends to principles of adult learning, follow up by those providing the CPD, and subsequent evaluation: factors that inclusive curriculum design seeks to address.

3.20 Gender

Using three phases of literature reviewing, local authority interviews and investigation of good practice examples, Condie *at al* (2006) gathered evidence of gender strategies in use across Scotland. Interviews were undertaken with key personnel in local authorities, management teams, teachers, parents and children. In pre-5 and early primary years the areas of literacy and personal and social development yielded many examples of coherent and successful strategies to counteract gender inequalities. Gender sensitive tasks and activities often had been created after staff involvement in courses and seminars which addressed the learning styles in relation to learning and teaching approaches with gender differences taken into account as an element. While there was little evidence that classroom organisation in these sectors had been organised to take account of gender inequalities there were demonstrations of discouragement from stereotypical patterns. In establishments in which successful gender-related strategies were observed there seemed to be three key characteristics of a strategy champion, staff development and parental involvement.

Forde *et al* (2006) prepared an extensive literature review to accompany the research project on which the Insight 31 report is based. The section of the literature review which relates to early education identifies evidence of gender inequalities in baseline assessments in Primary 1 in relation to literacy and personal, emotional and social development of boys. According to research reports cited (BERA, 2003) two significant influences were prior attainment and teacher expectations. There are also reports of differences between boys' and girls' attainment widening from Primary 3 and that literacy, particularly writing, indicated the greatest attainment gap.

3.21 Conclusions – Early Years and Primary section

The architecture of the curriculum can be envisioned as the structure and framework for the curriculum. Brady et al (2004) describe this as a Christmas tree – curriculum needs a structure and a framework, an architecture: on which the ornaments of educational requirements, e.g., subjects and learning processes can be 'hung'. In a review of curriculum at university level a working group considered the kinds of curriculum architectures that would be needed to solve identified problems such as perceived lack of flexibility and a tension between core curriculum and choice. The model of curriculum architecture

addressed the basic components of curriculum, areas of knowledge, integration of knowledge, modes of inquiry, credit requirements, assessment, and factors that might impose limitations, such as physical space, timetabling and staff workload. The importance of the language used to describe curriculum was emphasised: it should be clear and compelling, and the messages about curriculum should be developed in tandem with the curriculum itself.

The concept of curriculum architecture has not yet developed a strong currency in the literature relating to early years and primary school. Numbers of component parts to a curriculum architecture have been researched and brought together in the present review. In particular the review focuses on pedagogy, early education as a separate or continuous phase, learning environments, class size, class organization, grouping practices, sub-groups of pupils, formative assessment, pupil motivation and motivated teachers, and the normative nature of effectiveness. In reviewing appropriate curriculum architectures, Hawkins and Graham (2004) highlight that each school must create its own curriculum. Often the literature separates early years and primary education: here the focus on themes that permeate both early years and primary school is summarized below.

- *Pedagogy* emerges as one of the most important elements of curriculum architecture. Concepts of sustained shared thinking, joint construction of meaning, deepening learning, differentiation and diversity each make a key contribution to bridging curriculum content and learning and teaching approaches.
- A strong literature focuses on early childhood and addresses whether *early education should be viewed as a separate or continuous phase.* Findings focus on: three to six years emerging as a distinct phase; high expectations of early childhood education as a vehicle addressing disadvantages; the enhancement of both cognitive and socio-emotional aspects of learning and development; holistic, active and self-regulatory approaches to learning as crucial, and on the significance of early educational transitions.
- *Learning environments* are earning an increasing emphasis in the literature and the influence of environment should be addressed particularly in terms of accommodation, interaction, resources, programme structure, learning activities and parental involvement
- The relationship between *class size* and pupil learning has often been contested. Typically factors taken into account are physical space, grouping practices,

discipline, ethos, peer relationships and teacher interaction. There is evidence that concludes class size makes a difference to pupil learning in some cases.

- In terms of *class organization* the strongest message emerging from the literature is twofold, that classroom organization has a primary function of promoting pupil involvement, and should also be flexible and strategic to support children's learning.
- Standard approaches to *grouping practices* should be reviewed in the light of evidence from the literature that shows that seating arrangements and pedagogical practice are often poorly linked.
- Addressing the needs and rights of *particular groups* of pupils is particularly emphasized in a climate of inclusion and attention to diversity. Findings reveal that the push to normalize the pupil rather than to change environment or teaching approach remains common, but approaches to combat change are being developed.
- The concepts of *pupil motivation and motivated teachers* are found to be key drivers in the development of a curriculum architecture to support the aims of successful learners, confident individuals, effective contributors and responsible citizens within the early years and primary levels of a 3-18 curriculum. By combining concepts of pupil and teacher motivation, joint agency is promoted.

The normative nature of effectiveness emphasises 'the primary task' of early and primary education and how this is arrived at, which includes paying attention to the school culture, continuity of staffing, the mindsets that produce effective and enriched teaching, attention to classroom processes and the importance of both leadership and management.

4. The secondary school

In this section the review addresses the challenges of linking curriculum change and curriculum architecture in practice, as illustrated in the literature. Curriculum architecture is often seen as a neutral mechanism for delivering a country or region's curriculum change. However, the literature suggests that some aspects of curriculum architecture can impact negatively on certain subgroups within the pupil population. The architecture itself may become the end rather than the means. The relationship between schools systems and structures and the nature of the learning process is not always made explicit. In other words, the architecture, rather than being the facilitating mechanism of curriculum change, becomes a barrier to the stated aim of raising achievement of all learners, and some subgroups in particular.

The current process for curriculum change in Scotland clearly has implications for curriculum architecture (*A Curriculum for Excellence, progress and proposals, 2006*), not least in the secondary school. It has long been recognised that the secondary school, with its more rigid timetabling structure, its focus on external examinations and its subject-based approach to curriculum organisation, is more difficult to change than pre-5 or primary schools. *A Curriculum for Excellence* (2004) was not expected to offer practical guidance to secondary schools on how a curriculum based on the four purposes of successful learners, confident individuals, effective contributors and responsible citizens can be timetabled. Nor does it make explicit how learning which makes connections across different fields of knowledge will affect how individual subjects will be taught. And, as yet, no major reform of the external examination system has been mooted.

What then does the literature tell us about how curriculum architecture impacts on the process of change and on the learning of young people? The following review of the research literature has been organised in sub-sections corresponding to the review specification.

4.1 School timetables

Secondary school timetables are, perhaps, one of the most pervasive ways in which a curriculum can be facilitated or obstructed. Historically, surprisingly little advice has been forthcoming from central sources to accompany curricular change. For decades, very few policy documents have made any explicit reference to how the proposals might be turned into a timetable which can be staffed or which can articulate with other demands. Instead,

regional timetablers have worked in collaboration with HMIE and others to produce models of how, for example, Standard Grade (1977) or Higher Still (1990s) might be timetabled. The one exception to this was the guidance offered to secondary schools by Scottish Consultative Council on the Curriculum (the forerunner of Learning and Teaching Scotland) on secondary school structures, known colloquially as “the yellow peril’’ because of the colour of its cover. While it was never designed to be prescriptive, it quickly became the standard reference work for secondary school timetablers.

In recent years, there has been a remarkable degree of uniformity across Scotland in secondary school timetables. Over the last two decades, we have seen shifts from the 25-period week (to accommodate area curriculum planning arrangements) to the 30-period week (to accommodate an eight Standard Grade structure) and now to the putative 33-period week (to accommodate the McCrone agreement and changes in patters of presentation of pupils for national examinations). What these phenomena have in common is that they are the result of pressures from outside the school, most commonly related to the examination system, and rarely, if ever, relate to any theory of learning or advances in pedagogy.

In the primary school, there has been no such national guidance on *timetabling,* but there has been direction on the structure and balance of the curriculum, most notably in the 5-14 Programme. Precise percentages of time for each of the curricular areas were laid down and formed the basis of inspections by HMIE. Some objected that it led to an ‘accountancy model’ of curriculum planning, where hours and minutes became more important than the quality of the learning and teaching.

In the secondary school, a similar concern to avoid any subject at Standard Grade receiving even a single minute more per week than another, has led to period lengths of such precision that it is not uncommon for period one to begin, say at 9.03 and end at 9.58 in one school while in another, which may start a little later or have a different arrangement for registration, period 2 might begin at 10.01. This apparent randomness is in fact the opposite; it is an approach to timetabling which seeks to ensure that, at the end of the 2-year Standard Grade course, the number of minutes devoted to Chemistry is the same as that given to Physics.

A Curriculum for Excellence, philosophically, is unlikely to seek uniformity in timetabling structures across Scotland’s secondary schools. Indeed, the pressure to do so is now more likely to come from the schools themselves, since they have come to expect such guidance.

If new timetabling models are to emerge as a result of the changes which the new curriculum thinking produces, then it is reasonable to assume that these should have their rationale in learning and teaching and should be informed by evidence of what has taken place elsewhere in the world.

Whether there needs to be national guidance at all is the first question which might be asked. Andersson (2004) outlines the decision by the Swedish government in 2000 to start a five-year trial where a limited number of municipalities and schools were allowed to abandon the national timetable for comprehensive schools. During the trial period no limits were placed on the amount of time spent on each subject. Only a guaranteed minimum time, for all subjects together, was mandated. No change was to be made in the national curriculum, national grading criteria or national tests. The timetable-free trial was evaluated nationally. The key questions were: “is a timetable necessary?”, and, if so, “what form should it take?”

Andersson focuses on what happens to assessment and grading in timetable-free schools. In the early 1990s, secondary schools in Sweden could opt to become “timetable-free”, i.e. to take control of their own timetable, both in terms of time allocations to subjects and in terms of the extent to which they could move to a more continuous, criterion-referenced approach to assessment. In this study, politicians, headteachers and teachers were interviewed in six schools about the effects of assessment and grading. Four of these schools were "timetable-free" schools, while the remainder worked with the national timetable unchanged. The results from the interviews indicate that the basis of school assessment and grading is changing. Schools responded to an increase in "free choice" with increased attention to time allocation and time-keeping. Assessment and grading are also about control. The control function is very explicit in years 8 and 9 in the comprehensive school (grundskola), because of a close connection between grading and admission to national programs in the upper-secondary school (gymnasieskola). One background to the results seems to be that the national timetable is deeply rooted in teachers’ minds and school-culture. Teachers in schools with “no timetable” felt that “*the timetable is still haunting*”. Even if a minimum of time is not prescribed, most teachers work as before this change.

Klein (2001) describes how previous research had revealed that lower grade elementary school pupils in Scandinavia who differ in their ability to learn to read also differ with respect to the optimal time of day for reading achievement. His study strove to determine the hours of optimal attention in older pupils who varied in their apparent aptitude for mathematics. A

sample of 204 fifth graders and 202 tenth graders were divided into three groups (high, average and low ability) on the basis of their mean yearly mathematics achievement scores. The subjects were asked to report on their attention levels throughout the day. The findings showed that fifth graders' attention levels were especially high in the afternoon, whereas tenth graders reported increased concentration during the morning hours. Among tenth graders, but not among fifth graders, there was a significant interaction between mathematics achievement and attention levels at various times of day. However, the practical implications of these findings for the planning of school timetables are not discussed except insofar as they rarely take account of issues such as bio-rhythms or other factors which might affect pupils' learning readiness. In the Scottish system, English and Maths are traditionally done in the morning in primary schools for, largely anecdotal, reasons of pupil motivation, though few primary headteachers would claim to take bio-rhythms into account.

McCreary and Hausman (2001) argue that, despite the popularity of 'schedule modifications' in the USA as a cost-effective reform to improve student outcomes, little empirical research on the consequences of alternative schedules has been conducted. They suggest that the literature has been dominated by anecdotal reports. Even when empirical evidence is examined, causal comparisons of school outcomes between schedules must be interpreted with caution, due to the number of confounding variables. A review of the literature shows positive and negative outcomes that depend on how teachers make use of schedule changes.

The issue of length of lessons is reviewed throughout the literature, with a number of studies indicating that increasing the length results in deeper learning and more individual student attention from the teacher. Fewer lessons means fewer class preparations and therefore more teacher-student interaction. It also leads to more diverse pedagogies and more personalisation of learning. It is suggested that non-traditional approaches to class scheduling lead to more innovative approaches to classroom organisation and pedagogy. Planning time is increased and teachers can focus on individualisation of planning.

Impact on pupil achievement is positive when schools move to 'block scheduling' (i.e. planning lessons in longer blocks of time). Learner-centred projects, co-operative learning and group-work are all facilitated by longer blocks of time. Students report that learning is more meaningful when these approaches are used. In some schools, there were reports of an increase of up to 25% in the number of As in mathematics and there were fewer incidences of indiscipline overall in the schools. Attendance improved, graduations

increased and drop-out rates decreased. Student attitudes improved, as did levels of 'cognitive engagement'. Student stress appeared to reduce and school climate improved.

On the negative side, McCreary and Hausman reviewed studies which cited teacher concerns about longer lesson times causing problems for pupil concentration and making more demands on them vis-à-vis teaching approaches. If classes meet less frequently, the pupils may require more review time, and if teachers do not adapt to the new length of lesson with new strategies, little gain will accrue. The strongest argument against structural change is that it is insufficient in itself. If the classroom environment remains 'static', pupil outcomes will not improve. Thus, if new pedagogy is desired, simply increasing lesson length will not be enough. Instead, planning time must be well used and CPD must be available for teachers. Thus it is not the modification of the length of time which brings about improvements in pupil outcomes, but rather the use made of the additional lesson time.

The study described in their report compared the outcomes of achievement attained by high school students educated in block, semester, and trimester schedules in one urban district during 4 years. The study examined student annual grade-point averages, scores on the Stanford Achievement Test 9, credits attempted and earned, and absentee rates. Descriptive and inferential statistics were utilised. Analysis of covariance was the primary tool to test for mean differences between student outcomes. The study controlled for race or ethnicity, limited English proficiency, free or reduced lunch, gender, and special education. Students in a semester schedule had higher grade-point averages (adjusted mean 2.35) than those in block schedules (2.29) or trimester (2.22).

Although the differences in this study were significant, questions regarding their practical significance should be raised. Weick's social-psychological model of organising suggests that a school's normative structure is only loosely coupled with its behavioural structure. In short, structure may change without affecting behaviour, and *vice versa*. This study reaffirms the importance of educators thinking beyond structural changes. While structural changes may be necessary for student improvements, they are not sufficient. Educators must also consider the necessity of curriculum and policy alignment, professional development, changes in power relationships, and normative changes regarding schooling.

In 2004, the DfES published a report sub-titled "Designing a Flexible Curriculum" with a focus on "A condensed Key Stage 3". Drawing on six in-depth case studies and referring to almost fifty schools in total, the report considers the phenomenon of underachievement in Years 7,8 and 9 (S1 to S3). DES Circular 7/90 laid down a minimum length of the school week but did not lay down prescriptive time allocations for subjects.

Schools which decide to complete Key Stage 3 in fewer than three years have considerable freedoms, for example:

- which subjects to prioritise
- which additional subjects/skills to add
- how the curriculum is organised
- time allocations to subjects
- number of teaching hours in the week
- length of lessons
- number of days in the timetable cycle
- number of terms in the year
- ways of grouping pupils
- ways of meeting individual pupils' needs

In reaching their decisions, schools must take into account:

- the impact on pupils
- subjects to be condensed
- blocks of time to be devoted to learning

The rationale underlying the permission to condense Key Stage 3 is:

- improvement of transition from primary to secondary schools
- improved organisation of the curriculum
- improved learning and teaching
- a broader, more flexible curriculum

The report then cites a number of examples of good practice at some length. However, it offers no conclusions or recommendations. The inference the reader must make is that it *is* possible to condense Key Stage 3 and that ordinary schools are not only *capable* of doing it; they *are* doing it. Prescription is not the policy; gentle nudging by peer examples is the approach.

The educational press has carried a number of articles on the subject of timetable flexibility, also reflecting on a range of practice. In a Times Educational Supplement (TES) article, 'A matter of time', published on 8 November 2002, Keith Grimwade, head of Cambridgeshire LEA's curriculum advisory service, reports on how flexible timetabling in English primary schools has made possible more effective curriculum delivery. The example reported

relates to geography and indicates that suggestions are based on QCA guidelines on designing and timetabling the primary curriculum, but some general points are made which have relevance to secondary schools: about capitalising on what could have become slippage time; on combining objectives from a number of subjects; on blocking particular subjects for longer periods over a term and then creating termly rotations. This is not an empirical study.

In a TES article, 'New ideas boost learning', published on 19 July 2002, Julie Henry reports on a pilot study run by the Royal Society for the Arts encouraging schools to experiment with the curriculum. The pilot involves three schools. She describes arrangements made by the three participating institutions to utilise alternative timetabling models and reports on one investigation into the impact on attainment. The three institutions make use of cross-curricular modules or projects or independent learning assignments instead of 'unconnected, hour-long subject lessons'. The results of the investigation, conducted with one third of Year 7 pupils in St John's School in Marlborough, Wiltshire, suggest improved attainment in maths and English and improved behaviour over the period of the year. Little detail is given of how the investigation was managed.

In a TES article, 'School escapes timetable madness', published on 12 April 2002, Cherry Canovan reports on a flexible timetabling project which was praised by chief inspector, Mike Tomlinson, after his visit to Leasowes secondary school in Halesowen, West Midlands. There is no research basis to the article, which describes how Friday of each week is allocated to one five-hour block of teaching and learning time during which people are brought in to work with pupils or visits are arranged or pupils can concentrate on a single project or subject.

In a TES article, 'Head drops Friday pm classes to attract staff', published on 19 October 2001, Sue Learner reports on arrangements made in Highbury Grove school in Islington, north London, to permit Friday afternoons to be allocated to arts, sports and drama programmes. In this school there is also a system of primary teachers working with transition pupils with support needs in the secondary school building but in single teacher cross-curriculum classes for core subjects. No research base is given in this report.

4.2 Choice and personalisation

In secondary schools, the tautology “option choice” refers to the process normally carried out between S2 and S3 where pupils choose subjects to be studied at Standard Grade level. Stables (1997) draws upon his own ‘option choice’ study of 1996 as well as a body of international literature to argue that 14 year-olds have very little in the way of a holistic view when making subject choices. There was little evidence of a ‘life-plan’ or of how the choice might impact upon their future. If choice is to be offered earlier in schools as part of the process of allowing pupils to sit national examinations earlier, the implications for pupils, parents and teachers include a need to ensure that the choice process is not superficial or rushed. He also argues that if pupil choice is to be part of the preparation of young people to behave as responsible citizens, then choice among subjects is not enough; choice within subjects should begin much earlier.

Cochrane and Straker (2005) used a sample of 600 pupils in an LEA in England to look at the manner in which pupils make subject choices, particularly with regard to vocational courses. They found that student perceptions of teacher-influence in their choices appeared low. Many either received no individual guidance, or were unaware of guidance received. When making choices, GCSE students appeared more interested in the opinions of their friends than those of their parents or other adults, while students on work-based courses took the largest influence from their parents/guardians, and very little from their friends.

Satisfaction with courses was generally high, and students found the work was at an appropriate level. This suggests that whatever guidance is given, the students do generally enrol on the most suitable course. Motivation for current and future studies/work appears to be lower in GCSE students than in vocational and work-based students. There is possibly an argument that all school courses (GCSEs included) should have some form of work placement/vocational/study skills module attached to it.

These conclusions led to the following recommendations:

1. An involvement for students in the options process which gives them active experiences of the courses on offer, possibly by the introduction of such elements [during key stage 3].
2. Guidance which focuses on the consequences of decisions at this stage of their careers. This might involve prolonged work exploring career paths through year 9 [S4] and earlier.

3. Visits to/from HEIs to encourage as wide a range as possible to see higher education as being accessible, through both the GCSE and vocational pathways.
4. Encourage a wider range of abilities to consider vocational courses by offering courses which stretch across the full range of abilities.
5. More personal careers advice.

In the context of subject choice as a method of enabling pupil access to an appropriate curriculum, Ayalon (2006), writing from an Israeli perspective and using multilevel analysis to examine the outcomes of some 19,000 students across 200 schools, suggests that deep-seated assumptions around vocational and academic subjects may get in the way. Israel, in an attempt to make the education system more accessible to all students, created a system based on subjects being offered at different levels to pupils at the same stage, thus, theoretically, allowing all students to find courses to suit their own level of attainment and aspiration. However, he found that the choice resulted in greater levels of inequality in achievement by gender and socio-economic status. Paradoxically, the greater the extent of the choice, the greater was the inequality. Ayalon concludes that pupils may be 'advised' or 'steered' towards courses on the basis of gender and assumptions about their ability rather than any robust assessment of their potential.

Brown (2001) looked at gender issues around subject choice across 25 years in English secondary schools. She used the Gender Inequality Index (GII) and concluded that neither the Sex Discrimination Act nor the National Curriculum could halt the decline in GII at A level, while only the National Curriculum appeared to make an impact at GCSE. Using DES statistics, she concluded that during the 25-year period, gender inequality in subject choice rose at A level, indicating that if subject choice is seen as one way of supporting greater gender equality of opportunity, then clearly it has not been influenced positively by either the National Curriculum or the Sex Discrimination Act. She concluded that proactive interventions prior to the subject choice process may need to be undertaken to challenge gender-stereotypical perceptions of subjects. The evidence that there has been some improvement at GCSE needs to be examined when the cohort (the first full one since NC) reaches A level.

There is growing concern across the UK about the apparent decline in interest among young people in the sciences. As part of the Relevance of Science Education (ROSE) project, Jenkins and Nelson (2005) surveyed 1277 students from 34 schools as part of a wider European study based in Oslo. Using a sixteen item questionnaire, they looked at gender and other factors which might correlate with interest in science. Using a 108 item bank, they

asked pupils to indicate which aspects of science they would like to learn about and cross-referenced these to the initial questionnaire scores. Boys and girls, it was found, have significantly different interests within the sciences.

The conclusions drawn from the study which might impact on how schools go about the subject choice process include:

- Exploration with pupils of the range of careers in which science might play a part needs to be more wide ranging and imaginative
- Schools should attempt to find out and take account of the topics and issues which actually interest young people and where possible respond to different interests of boys and girls
- Attempts should be made to link science with other subjects (e.g. a popular topic was how CDs/tapes/MP3 players were made)
- Tailor the science curriculum, where possible, to the interests and enthusiasms of the young people

In an American study carried out across 30 states, Lee *et al* (1998) found that curriculum structure, in this case the types and numbers of mathematics courses offered and chosen, has a direct and indirect effect on the students' achievements in that subject. They looked at curriculum differentiation (where many courses were on offer at different levels) and constrained curriculum (with a single set of goals for all students, thus with student choices and options limited). A historical review argues that the latter is associated with Catholic Schools in America which have tended to outperform public schools. The former model tends to be followed in public schools.

They looked at three issues: course taking, achievement and equitable distribution of course taking and achievement. Looking at maths, they hypothesised that the more constrained the choices, the higher would be the achievement. The sample was 1035 schools and 25,000 students across 30 metropolitan statistical areas, with pupil information collected from grade 8 through to grade 12. Data was drawn from parental background, student attitudes and attainment and school effectiveness ratings.

Their findings were:

- In schools with more diverse student populations and with lower socio-economic status, students make less progress in maths.
- Students in smaller schools (and in private schools) make more progress.
- In schools which offer more courses aimed specifically at lower-achieving students, rather than fewer courses aimed with higher expectations of achievement, students make more progress.
- "Limiting low-end course options" are associated with low student achievement.
- Course structure is a more important determinant of student achievement than type of school.
- Socio-economic status (SES) and balance of student composition within it are key determinants of success.
- The more low-end courses on offer, the fewer students there are who move to the higher-end courses.
- Curriculum structure influences social equity in achievement.

In 2005, DfES published *The Learning Environment,* focusing on resourcing aspects of personalisation. The report contained three synopses of schools trying to integrate personalisation and the learning environment. One of the aims was to illuminate the issue of school design and its relationship with personalisation. It refers to another DfES publication, "Building Schools for the Future", and suggests that the concepts of 'schools' and 'classrooms' may nowadays be outmoded. However, re-designing schools is not just about building projects; it is about flexible use of existing spaces. It is also about learning environments, including with whom pupils learn, mixed age learning, deployment of adults other than teachers, use of technology. It ends its preamble with an invitation to consider whether change to date has been too evolutionary rather than revolutionary, and suggests a revolutionary move from best practice to Next Practice.

The study, 'Market Forces and Diversity in Local Schooling Markets: Evidence from the 14-19 curriculum', by Davies, Adnett and Turnbull (2000), focuses on three local education authorities in England and investigates the interaction between the policies of promotion of competition through comparison and the promotion of competition through specialisation. The curricular areas in which there was freedom of choice for schools were identified as foreign languages, economics and business studies and qualitative data were gathered to identify how choice led to changes in the curriculum. The study is based on the economic principle that there are incentives for schools to differentiate themselves from other schools in the local market in order to increase resources available, to acquire a label for the school

and also to make efficiency gains. The focus is on the later years of compulsory schooling, as at this stage there is an assumption that this is where greater diversity is to be found 'in local markets for older students'. The research involved examination of the introduction and termination of courses and the reasons given for the changes, and these changes were accessed in semi-structured interviews with senior managers and heads of departments from 16 establishments with a range of sizes, growth patterns, intake, governance and examination results. The findings indicate that small, declining schools faced increasing problems in maintaining the curriculum they considered appropriate to a comprehensive school and that the balance of the curriculum in such schools was moving more towards vocational courses. Larger schools did not experience pressures to change the curriculum. Within and between schools there was a range of conceptions of what was meant by a 'comprehensive school'. In smaller and declining schools there is evidence of increasing polarisation of peer groups in schools.

Richards' study (2005) examines subject choice from the perspective of a number of sixth form students in a selective and traditionally academic school in London. He makes the proposal that the study illustrates how judgements of self-worth are negotiated in relation to class and gender in current educational settings. The subject choice used is A-level media studies. Richards discovers in the interviews conducted that there is evidence of a gendered hierarchy of subjects in such settings and that students choosing subjects such as media studies are defensive and relate the choice to future careers. Examining more closely the interviews with four students, Richards suggests that students from aspiring middle class families have to negotiate between parental expectations of career paths and the choices made to study subjects such as media studies. Decisions to adopt media careers may be the compromise that students propose in order to legitimise choices in such situations. Students express their enthusiasm for the subject in terms of the creativity and agency offered in their studies of the media, and invest in the choice on the basis of this, even while the choice has created dilemmas in respect of peer and parental perception of the subject as less academic. Richards concludes that the meanings of subject choices are embedded in familial, educational and wider social circumstances of the students. The suggestion is that students appropriate the subject in a variety of ways but, in their preoccupation with education and career success, construct their choices as investments in future work.

In a critique of Government policy in England (2005) on "choice, customisation and corporatisation", Harris and Ranson suggest that there are "competing concepts of choice". They argue that offering personalisation of learning is different from offering choice of schools, and yet the two are often linked together in the phrase "personalisation and choice".

One, they argue, is about *needs* (i.e. of individual pupils), while the other is about *rights* (i.e. of parents and families). One is about excellence in learning and teaching for all pupils irrespective of background; the other is about competition in an educational market-place.

They consider the issues of diversity and personalisation and suggest that there is similar conceptual confusion, leading on the one hand to specialist schools which may lead to a narrowing of choice, while the stated aim for individual children within the notion of personalisation is to tailor the learning to their individual needs. They conclude that if the overall policy strategy is designed to break the link between poverty and underachievement, then personalisation and choice is likely to be most effective at a local level rather than centrally managed at a national level. The empowerment of schools and their communities is crucial if personalisation and choice is to have the desired effect. Schools and clusters of schools, working with and for their communities, are best placed to offer real personalisation and choice.

Leadbetter (2004) in a policy-related pamphlet written for the National College for School Leadership (England) and Demos, a think-tank, argues that personalisation is a "powerful solution" to the problem of putting children's learning at the centre of the education process. However, he also suggests that it cannot be seen as "a stand alone initiative" and must be "understood as a characteristic and a culture of the whole education system".

He argues that students choosing what they learn, how they learn and how they are assessed, is at the heart of personalisation. He links these concepts to current, ongoing initiatives such as 'learning to learn' (met cognition), greater flexibility in subject choices and formative assessment with its emphasis on peer- and self-assessment.

He suggests that the student voice, or 'citizen voice', in education is key in personalising the system but also in allowing young people to take more responsibility for their own learning. 'Personalisation through participation' is presented as a key idea, and he warns against the professionals seeking to control the choices young people make. He proposes 'intimate consultation', 'expanded choice', 'enhanced voice' and 'partnership provision' as being among a number of characteristics of personalised provision. 'Students as co-producers of the educational script' involves, he suggests, continual and rigorous self-evaluation, with teaching styles and a pedagogy which recognise diversity. Assessment for learning and learning outside the classroom are two central elements of such a system, with teachers working collaboratively to find solutions and working, with others in the community and in the business world, to meet the needs of the whole child.

Among the barriers to the aim of personalisation being achieved is that in such a system, the middle class families and children will be better placed to take advantage of such opportunities. Leadbetter argues that this is where the professionals come in, acting as advocates for disadvantaged young people, but also suggests that Government has to ensure that schools in the most disadvantaged areas are funded adequately. Personalisation is not a panacea, he concludes, but offers the best chance of success at the present time.

Whitehead (2004) looked at Education Action Zones in England and found that the "pupil voice" was missing in decision-making. In a survey of 139 pupils' views in which the respondents showed a mature insight into the processes of schooling, he and his colleague concluded that pupils need to be active partners in the process of reform or change. Such involvement, they argued, would help to:

- begin to re-engage the most disaffected students
- improve behaviour management
- increase interest in literacy and
- help teachers to create an environment more conducive to learning.

In an Australian study involving 11 schools, 27 teachers and 822 students, Brooker and MacDonald (1999) set out to discover how students might be given more of a voice in decision making within PE. They concluded that if groups of pupils who have traditionally been marginalised within PE, most importantly girls, are to be given a say in curriculum and syllabus matters, then lip-service will not be enough. They rejected the practice of having token students on staff-dominated curriculum committees and suggested that schools need to do more to build in participation in decision-making from an early age.

Pollard and James (2004) edited "Personalised Learning: A Commentary by the Teaching and Learning Research Programme" funded by ESRC. Personalised Learning is described as a "Big Idea" which includes "high expectations, given practical form by high quality teaching based on a sound knowledge and understanding of the needs of every child." It is based on five key ideas:

- assessment for learning
- effective teaching and learning

- curriculum entitlement and choice
- school as a learning organisation
- beyond the classroom

Out of the case studies presented in the report, the authors suggest four key issues, presented as challenges in the development of personalised learning:

- The concept of personalised learning is not yet sufficiently understood and therefore remains contested.
- The authenticity of the concept is in doubt if there is not clarity about the centrality of 'learning' as opposed to teaching programmes and curriculum delivery.
- There needs to be realism about the possibility of scaling up from examples of good practice.
- There are risks associated with personalised learning – lack of clarity of concept; need for support of teacher organisations; new pedagogy and related CPD for teachers; need for joined-up government; being prepared to face up to the risks and challenges.

Burgess *et al* (2004) looked at setting and choice in English secondary schools. Using the Pupil Level Annual School Census data, they looked at gender, socio-economic status and ethnicity in the secondary school context. More than half of 11 year-olds in England do not go to their local school. The conclusion is that where there is more choice of school, there is more sorting by ability among schools. The problem here for educational policy-makers is that if certain schools attract pupils of higher attainment, and such schools, through their success, attract more dynamic leaders and staff, then the gap among schools may widen in terms of attainment.

A study which takes account of school choice in publicly funded schools in England and Wales is 'School Choice Impacts: What Do We Know?' prepared by Gorard, Fitz and Taylor (2001). The paper is based on 'the largest scale study of school choice' and 'an entire national school system' and refers to 'a great deal of empirical evidence from the UK' using several datasets of official statistics and interviews of subsets. The findings report an overall decline in socio-economic stratification between schools after 1989, and this applies to secondary and primary schools, in each economic region of England and Wales, and in the majority of local authorities and school districts. The conclusion reached is that schools have generally converged over time in their socio-economic composition. There is no

evidence that the process of school choice has led to schools becoming increasingly stratified in terms of indicators of disadvantage. Differences in attainment have declined as measured between the highest and lowest achievers, ethnic groups, boys and girls, economic regions and school sectors, though the writers recognise the continued importance of socio-economic as opposed to educational determinants of school outcomes.

4.3 Class organisation

In Scotland the issue of class organisation has been prominent since the 1990s, when HMI(E) began to advocate the practice of setting pupils by prior attainment as a strategy for raising attainment (1996; 1998). The literature review undertaken by Harlen and Malcolm was published in 1997, a year after the HMI report it had been commissioned to inform. Its conclusions did not support the advice given to schools by HMI. Boyd (2005) has outlined the recent history of the setting versus mixed ability debate in Scotland, while the most comprehensive treatment of the issues of intelligence, ability and potential has been provided by Hart *et al* (2004). In Scotland, Sutherland and Smith have published accounts of pupil perceptions on setting, while the American, Adam Gamoran, has written extensively on setting in Scotland and 'tracking' in America. Class organisation and organisation of learners within classes clearly have direct influence on pupil achievement, and decisions made by schools and departments on this matter represent a crucial part of curriculum architecture.

Boaler *et al* (2000) report findings from the first two years of a four-year longitudinal study into the ways that students' attitudes towards, and achievement in, mathematics are influenced by ability-grouping practices in six schools. Through the use of questionnaires administered to the whole cohort of 943 students, interviews with 72 students and approximately 120 hours of classroom observation, the relative achievement in, and the changes in attitudes towards, mathematics are traced as the students move from year 8 (S2) to year 9 (S3), with students in four of the six schools moving from mixed-ability grouping to homogenous ability groups or 'sets'. Ability-grouping was associated with curriculum polarisation. This was enacted through restriction of opportunity to learn for students in lower sets, and students in top sets being required to learn at a pace which was, for many students, incompatible with understanding. The same teachers employed a more restricted range of teaching approaches with 'homogeneous' groups than with mixed-ability groups, which impacted upon the students' experiences in profound and largely negative ways.

Almost all of the students interviewed from 'setted groups' were unhappy with their placement.

Hallam and Ireson, in a series of recent studies, have looked at the impact of class organisation on young people's attainment, attitudes and motivation. Their 2006 study explores pupils' preferences for particular types of grouping practices, an area neglected in earlier research focusing on the personal and social outcomes of ability grouping. The majority of pupils preferred setting, although this was mediated by their set placement, type of school, socio-economic status and gender. The key reason given for this preference was that it enabled work to be matched to learning needs. The article considers whether there are other ways of achieving this, which avoid the negative social and personal outcomes of setting for some pupils.

In another study (Hallam and Ireson, 2005), they set out to compare secondary school teachers' pedagogical practices in mixed and ability grouped classes and explore the extent to which either practice was influenced by the type of grouping practices adopted in the school in which they worked. The findings showed that the curriculum was differentiated more in ability grouped classes by content, depth, the activities undertaken and the resources used. The less able were given more opportunities for rehearsal and repetition, more structured work, more practical work, less opportunities for discussion, less access to the curriculum, less homework with less detailed feedback, while work proceeded at a slower pace and was easier. Differences in pedagogy were evident in the responses of teachers who taught both mixed ability and ability grouped classes. This suggests that it is the structures themselves which lead teachers to change their teaching practices rather than their own personal teaching styles. The power of the grouping structures is further confirmed by the similarities in responses from teachers working in schools where the predominant grouping practices differed.

In an earlier article (Ireson, Hallam and Hurley, 2005), they suggest that the UK has moved towards increased use of setting (when students are assigned to different 'sets' on the basis of attainment in individual subjects) in response to government policy and the introduction of competitive pressures such as performance tables. Previous research findings about the effects of grouping students by ability have not given consistent messages and reflect great variety in practice in different schools and in different countries.

Previously, (Ireson, Clark and Hallam, 2002) they had studied over 6000 students in English secondary schools and used statistical analysis to isolate different factors that might affect

achievement in order to identify the specific effect of setting by ability. The study found that, when other variables were controlled, the number of years of setting had virtually no effect on average GCSE attainment. Yet there was a profound effect on the attainment of individual students of the same ability who were placed in high or lower sets.

Another study looking at the same stage (2005) examined the effects of setting on students' achievement in English, mathematics and science General Certificate of Secondary Education (GCSE) examinations. There were no significant effects of setting in English, mathematics or science. Effects on higher and lower attaining students were not consistent in the three subjects. Socially disadvantaged students achieved significantly lower grades and girls achieved higher grades than boys, especially in English. In all three subjects, students of similar ability achieved higher GCSE grades when they were placed in higher sets.

Other researchers have also been working in this area. Kutnick *et al* (2005) undertook a project designed to provide information on the nature and uses of within-class pupil groupings for teaching and learning in secondary schools in England. Their paper focuses on qualitative interviews with 20 teachers from three core curriculum areas in six schools. Interviews concerned the range and explanations for teachers' choices of group size and related teaching and learning practices. Interviews were transcribed and semantically content analysed. Results show that in some subjects (e.g. science and English), small group work formed an integral part of lessons. This was influenced by practical factors such as the need to share equipment or by the inherently interactive nature of the curriculum area (e.g. the role of discussion within English literature). In other subjects, groupings used in classrooms were dependent on individual teacher preferences. Only a few teachers considered the relation of social interaction and thinking, a dominant theme in current theories of learning. Teachers gave little actual pedagogic consideration to the learning purposes of different sizes of groupings. The size and composition of groups were heavily influenced by issues of pupil behaviour. Other factors that affected teachers' practice were the physical environment of the classroom and school seating policies.

In their recently published book, *The Urban Primary School,* McGuire *et al* (2006) look at the thorny issue of social class and ability setting. They argue that we cannot ignore that when ability setting is used, the lowest sets have the highest concentration of pupils from areas of disadvantage. This simply reinforces evidence from four decades of school effectiveness research from across the world, including Scotland (MacBeath and Mortimore, 2001). The practice of setting by ability is not inclusive, argue the authors, and they suggest that what is

needed is “a political commitment to eradicate social inequalities and injustices in education”. While the focus of the research is on the primary school, the conclusions have a resonance across the sectors.

A significant contribution to this area of study is the 2004 book, “Learning without Limits” (Hart *et al*). Drawing on a number of case studies of self-selected teachers and examining the literature on intelligence and achievement, the case is made for a pedagogy which transcends labels and categories of pupils based on tests or examinations.

4.4 School ethos and culture

The term “ethos” entered the educational discourse in 1979 with the publication of the seminal *Fifteen Thousand Hours* (Rutter *et al*). The authors concluded that individual schools could make a difference to the achievement of young people and found that a positive school ethos, defined as the quality of relationships in a school, was associated with school effectiveness. This issue was taken up in the 1990s by HMI, who commissioned a pack for schools entitled *Ethos Indicators,* consisting of a set of materials and instruments designed to enable schools to find out the perceptions of pupils, staff and parents on the impact of policies and practices.

Brady’s study (2005) examines the impact of secondary school culture on the dual student outcomes of academic achievement and engagement with the institution attended. Elements of school culture were identified, specifically the roles played by administrators, the professional teaching staff, and the adolescent peer group. A mixed-method research design was employed with the primary research instrument taking the form of a survey questionnaire that was distributed to 268 Grade 11 students attending two composite secondary schools in a mid-sized Canadian city. The results demonstrated that institutional culture had a limited impact on student academic achievement but a significant influence on students' perceptions of engagement with their schools.

4.5 Impact on pupils and on sub-groups within the pupil population

Condie *et al* (2006) conducted a literature review on strategies to reduce gender inequalities in Scottish Schools. Drawing also on good practice in schools and on interviews with local authority personnel, they concluded that schools should develop policies in this area, led by local authorities’ greater clarification in the guidance they offer to establishments. They found that pre-5 and early years practices tended to be more advanced than that of secondary schools and that cross-sectoral work was to be commended, particularly involving

CPD. In this regard, CPD was likely to be successful when staff felt some ownership of the issues.

Butler and Woolley (2005) report on research commissioned in 2004 by Security4Women (S4W), one of the four national Women's Secretariats funded through the Australian Government Office for Women. The need for this research came from a survey of over 3,000 women around Australia on their priorities regarding lifelong economic security. Women in Adult and Vocational Education (WAVE) was commissioned to undertake research on the interests of girls and young women in vocational education and training (VET), and 'Getting Real' reports on an investigation into the position of girls and young women in the later stages of senior secondary education in South Australia, New South Wales and Queensland as they prepare to finish compulsory education and enter the world of paid work. The report posits four directions for change for girls: more gender-sensitive career education for girls; sponsored vocational education for women; management education in gendered issues arising in the changing economy; and, critical vocational education in both schools and workplaces. The report argues that girls and young women should be active recipients of policy-making and implementation that support them. VET in Schools must assist them in their ambitions to 'get real', ensuring that the choices made by girls and young women are fully informed choices. What is needed are policies and practices that support girls and young women to fulfil their dreams, rather than setting them unknowingly on pathways that may well compromise their future economic well-being.

Lingard *et al* (2002) carried out their research on how the curriculum impacts on different sub-groups of the students in Queensland, using a mix of literature review, case studies and surveys of students and teachers. The sample was 19 schools, focus groups within them and whole year-groups participating in the surveys. What emerges is a complex picture, with family relationships, school and community environments, peer culture and student-teacher relationships all operating across socio-economic differences. They conclude that the following are the key factors:

- quality of teacher-student relationships and effectiveness of pedagogies
- pedagogies aligned to curriculum aims and assessment purposes
- teachers and their classroom practices
- CPD
- pedagogies which are challenging, connected to the world outside the classroom and which take account of and celebrate differences among students

- creation of professional learning communities

The authors conclude that it is more difficult to achieve the above in large schools, particularly large secondary schools. It can often happen within a department, but less frequently at a whole-school level. The authors use the phrase “engaging with and valuing of difference” as a key concept and return more than once to pedagogy as the key, as well as the culture of social relationships in the school.

A research report by Tinklin *et al* (2001) is based on a study carried out between October 1999 and January 2001 involving reviews of literature and policy documents, statistical analysis of official data, questionnaire surveys of local authority practice relating to gender issues, case studies of six secondary schools and associated primary schools across a geographical spread of Scotland.

Strategies for addressing gender differences in performance uncovered by the study include:

- awareness raising and in-service training which directly involved teachers
- development of whole school policies with pupil input
- formation of working groups, including cross-sectoral
- involving parents – crucial with under-achieving pupils

Approaches employed to change gender stereotypes and attitudes uncovered by the study:

- teaching about equal opportunities and encouraging pupils to reconsider subject choices and careers in relation to gender
- using positive role models
- employing strategies to raise aspirations and self esteem which counteract negative gender stereotypes
- motivating pupils by use of praise and rewards in consultation with pupils

Learning, teaching and classroom management approaches recommended:

- use of wide range of learning and teaching styles – overviewing/linking with previous work, visual aids, variety within lessons, sub goals in tasks, paired and group work, self evaluation and end of lesson reviewing
- employment of whole school literacy strategies

- consideration of single-sex and smaller class groupings

Martin, in a comprehensive report for the Australia Capital Territory in 2002, surveyed the literature, analysed questionnaire data from almost 2000 year 7 and year 9 students, carried out focus groups with almost 100 students and interviewed a range of professionals, teachers and academics. He concluded that teacher- and class level-effects are the most important factors, accounting for more variance in student achievement than school-level factors. Creating positive learning zones, appropriate pedagogy and listening to student voices were the key issues in trying to tackle underachievement among boys.

Demie (2001), writing in an English context, looked at "ethnic-related differences in achievement". She reviewed the literature from the 1970s and conducted research looking at data from Key stages 1 and 2 and GCSE across some 5000 pupils. The measures of school background used were free school meals, ethnicity and fluency in English. Among the factors influencing underachievement in various groupings identified were fluency in English and gender and, while the variation was not uniform among all ethnic groupings, the differences were almost universal.

The study also looked at school-by-school differences and tried to consider the factors which might be important in a school's performance in this area. Demie concluded that fluency in English needs to be given the highest priority by schools and local authority support services. In terms of curriculum architecture, she cites the following issues as being important for schools to consider:

- personalisation and target-setting
- pedagogy – variety of teaching approaches
- parental involvement
- mentoring
- CPD

In a follow-up study focusing on Black Caribbean pupils, Demie (2004) identified aspects of good practice in 22 'successful' schools in Lambeth. Among the aspects of good practice were the following:

- strong leadership and high expectations
- partnerships with parents and the community

- effective use of data for target-setting and school self-evaluation
- effective teaching and learning (including “letting children into the secrets” of the curriculum processes)
- using a relevant and inclusive curriculum
- commitment to attracting a more diverse staff team
- strong commitment to equal opportunities

In terms of curriculum architecture, it may be useful to focus on the following issues:

1) Effective use of data for target-setting and school self-evaluation.

Schools were prepared to gather data using a number of factors, including gender, social class, fluency in English and ethnicity, and to monitor progress of sub-groups across the curriculum. It is also done by departments and by individual teachers. Parents and pupils are actively involved in this personalisation process.

2) Effective teaching and learning (including “letting children into the secrets” of the curriculum processes).

Learning objectives are central to this process and these are not simply shared, but negotiated and ‘owned’ by pupils and teachers, working collaboratively. Planning is key and ‘quality interventions’ in pupils’ learning are carried out by staff. Innovation and creativity among teachers is highly valued and ‘teacher passion’ is a key ingredient on improving the quality of learning and teaching.

3) Using a relevant and inclusive curriculum.

Opportunities to study the contributions of people – men and women – from a range of ethnic backgrounds to the development of the world and of British society are central to these schools. The breadth of the curriculum is seen to be important, with the Arts enjoying equal status to more traditional ‘academic’ subjects. The role of the curriculum in fostering a ‘sense of belonging’ is emphasised in these schools.

In 2003, when the DfES published *Aiming High: Raising the Achievement of Minority Ethnic Pupils,* “policies, practices and procedures in schools” were considered as potentially placing barriers in the way of achievement of certain minority ethnic pupils. Strong leadership, high expectations, effective learning and teaching, an ethos of respect and parental involvement were cited as key issues to be addressed by schools in this context. In the section “How schools can tackle underachievement”, the report looks separately at primary,

primary/secondary transition and secondary and refers the reader to existing related policy guidelines. In the section on the curriculum, it looks at content and delivery. It suggests that citizenship is the best vehicle for addressing issues of equality and diversity, though it acknowledges that these must be addressed in all subject areas.

The report argues that pupils need to be involved in decision-making and also makes a case for parental involvement, from early years onwards. Indeed, it singles out early years as the foundation on which equality and diversity values should be built. It does not offer any specific advice on the more organisational aspects of curriculum architecture, but concludes that diversity and equality issues should be built into curriculum design, not added on later.

Tomlinson (2005) looked at race and ethnicity in her policy-oriented paper. She ranges over a number of policies the New Labour government has introduced, ostensibly to raise achievement and promote diversity and equality of opportunity. She briefly reviews the research since the 1960s which has demonstrated the link between disadvantage, ethnicity and gender and underachievement. She looks at refugee children and at exclusion rates and attendance as well as measures of attainment. She concludes that many national policies have failed to halt the underachievement among minority groups, in particular those from minority ethnic backgrounds, and argues for policies which include and empower young people and their families and communities rather than initiatives which segregate or inculcate low aspirations or low expectations.

4.6 Vocational education

A Curriculum for Excellence avoided treating vocational and academic education as mutually exclusive. However, in Scotland as in most of the developed world, the issue remains important, not least as countries face up to the challenge of a changing economic landscape and an uncertain global labour market. Some countries have focused on the needs of young people who are least successful in terms of school achievements and in terms of successful entry into the labour market (in Scotland the NEET group – not in education, employment or training), while others maintain a view that all young people can benefit from exposure to both aspects of education.

Crump and Stanley (2005) outline the incorporation of vocational education and training (VET) courses into a senior secondary certificate of education, the New South Wales Higher School Certificate (HSC), in the largest state of Australia. VET courses were introduced in 2000 to broaden the offerings available in post-compulsory schooling and to cater better for the vocational needs of students not primarily focused on university study. Their research

looks at the progressive implementation of dual recognition of VET courses in the HSC, and the growth in participation, through statistical and interview data. It argues that a major reform to curriculum and reporting of the HSC has led to a more integrated approach. To ensure parity of esteem, the opportunity to have the outcomes from VET courses count towards university entrance has been an important policy objective, but it remains unclear whether (a) structures, processes and embedded cultural practices allow students to take full advantage of this option, and (b) whether a VET option is as unproblematic as intended.

Dalton and Smith (2004) report that thirteen teachers and coordinators of vocational education and training in schools (VETiS) programs in eight Australian secondary schools were interviewed to determine the extent to which their involvement in school-based vocational education and training (VET) was grounded in their contact with contemporary workplaces, to identify the nature of barriers secondary teachers may face in forming and maintaining such contact, and to assess the issues that impact on the development of secondary teachers' sense of identity in relation to vocational education and training. VET studies are becoming an increasingly popular option for secondary students; however, this research indicates that these changes have had only limited impact on the role of secondary teachers. VET in schools, in spite of increasing student enrolments, has remained a marginal operation in many secondary schools, all but ignored by the majority of teachers, while making considerable demands and offering minimal support to those involved.

Fischer and Bauer (2004) describe the implementation in 1996 of a new curricular framework for vocational education in schools called "Lernfelder" (learning arenas) in Germany. In the concept of learning arenas, learning situations in schools have to be related to the work activity in a particular occupation. For this reason, work process orientation currently plays a significant role in German curriculum development. However, there is not one singular approach for transforming work activity into vocational curricula, but a variety of competing approaches. In this paper two important approaches are characterised and the strengths and weaknesses of each approach are identified.

It may be said that the work oriented turn-around in German curriculum development has not fully happened yet. The problems of analysing work situations in companies, of transforming work process knowledge into curricula and of assessing competences which students/apprentices have acquired are still on the way to be solved.

Golden *et al* (2005), working in the English context, looked at a whole cohort of young people aged 14 to 16 involved in the Increased Flexibility Programme, designed to offer them access to more vocational qualifications. Among their findings were:

- Young people achieved more than would have been predicted from earlier test scores.
- While students who took the courses in schools did better than those who did so with another provider, those who did so as part of a partnership between school and a provider did best.
- Partnerships involving groups of schools and employers where employers visited schools and *vice versa*, did best.
- Guidance for young people is crucial in helping them make choices and the guidance should be from a range of sources.
- If the programme is for a broad range of abilities, then care needs to be taken to ensure that teaching methods are varied and appropriate.

Higham and Yeomans (2005), reviewing the DfES sponsored enterprise education initiative called Pathfinder initiated in England and Wales in 1998, describe how many of the participating teachers drew comparisons between it and TVEI. The key factor, they felt, was sustainability, and while the authors do not necessarily share the teachers' analysis of the comparison with TVEI, they nevertheless conclude that the 39 Pathfinder schemes across England may well 'flower briefly' and leave little legacy for the rest of the country. "Sustaining, embedding and disseminating the development" is key, according to the authors.

Dixons and Dixons (2005), writing about developments in remote areas in Western Australia, nevertheless draw valuable lessons about the ways in which vocational education can be perceived. They report positively about the collaborative approaches to ensure that vocational education and training (VET) was successful. However, their greatest concern was that VET was seen as being only for the less able students. Indeed, they recommend that awareness raising through public meetings and liaison among stakeholders should take place. They recommend the creating of virtual learning campuses using new technology and involving all the partners. Finally, training and CPD delivered in a partnership context is, they conclude, necessary if VET is to be embedded.

Evans (2005), writing in New South Wales, looked at VET from the perspective of some 6000 students. His conclusion is unequivocal; "VET is working to the benefit of students,

employers and the community". It is increasing opportunities for leaver destinations *at all levels of student attainment* [my emphasis] and is improving student retention. VET students are more "work-ready" and transition from school to work is improved.

However, despite this unrelentingly positive conclusion, the author suggests that VET is still seen as a "lesser option". Some students, teachers and parents steer their young people away from it if they see university as their goal. Importantly, universities have signalled their view that it is a lesser entrance qualification. He raises issues about the danger of streaming, the need to open it up to all students lower down the school and the integration of VET into a broadly-based curriculum rather than a separate pathway. The conflict felt by school timetablers in terms of providing time for VET courses' out-of-school elements and the pressure on funding were barriers to the advantages of VET being extended to all students.

Hall and Raffo (2004) looked at 110 14-16 year olds in England and found that there were few positive spin-offs for the school experience of young people participating in work-related projects. Part of the problem was that the qualifications gained in the workplace were not always recognised by the school. Indeed, as Evans found above, the work-based element did not have parity with the school-based courses and even in some cases had detrimental effects on school work because of time out of school. Poor communication between school and the work-place led to young people slipping through the net in terms of attendance. More fundamentally, the ethos and culture of the workplace and the school often had little in common. Relationships with adults could be confusing. While peer group relationships improved for some young people, others found the workplace socially isolating away from the support structures of the school. For many young people, learning in a practical context allowed them to develop skills they had failed to gain in school subjects. For some students, re-integration to the school context was made difficult after experience of the workplace. The authors end on a positive note, recommending that the lessons, positive and negative, from this research can be used to plan such projects more carefully and will enable schools and partner organisations to plan for these eventualities.

Taylor (2006), in her discussion of the system in Alberta, Canada, finds an inherent inequality in the status of "twinkies" (pupils of lower attainment with uncertain life goals) and "bright lights" (high achieving pupils with clearly planned pathways). The research is based on interviews carried out with key educationalists working in this area. Alberta had moved in the 1980s from "practical arts" to vocational education.

Taylor concludes that, while it is known that the strategies middle class parents adopt to ensure that their children have the best educational prospects can impact negatively on those less advantaged families, we must acknowledge that what some schools do internally can perpetuate these inequalities. While no school wants to be known as a "vocational school", she argues, if only some schools take vocational education seriously, then the others (i.e. the schools where "bright lights" predominate), will continue to attract middle class students. To avoid this, business and commerce must be fully signed up to work in partnerships and any off-site provision must be of a high quality and designed to open up career opportunities for all young people.

She uses the phrase "the bottom 15%" and reports High School Principals admitting to worries about their ability to meet their needs. She makes the case for a high quality, broadly-based curriculum with vocational options for all young people as the way ahead. She argues that the discourse of lifelong learning should encourage schools to ask if we are currently meeting the needs of either the "bright lights" or the "twinkies". If we are to do so, then clear links between the school curriculum and the skill and knowledge demands of the world of work (including higher education) must inform the content and pedagogy of all (vocational) courses.

4.7 Pedagogy

The word 'pedagogy' is not in common usage in the Scottish educational community. However, since 1998, with the publication of *Inside the Black Box,* the work of Black and Wiliam has begun to influence teachers' practice in the classroom. The formative assessment initiative is national and many believe that it offers the best prospect of engaging teachers as reflective professionals in reviewing their pedagogies. It is based on a collaborative model of teacher professional development (Fullan, 2004) and is part of a global search for ways in which the quality of learning and teaching can be made more consistent within education systems (HMIE, 2005).

Jang (2006) argues that the implementation of the nine-year integrated curriculum in the primary and secondary schools of Taiwan represented, in practice, a great change to the nature of school teaching. This was mainly due fact to the that the new scheme for the curriculum required teachers to collaborate with one another, when they had been teaching students independently for most of their teaching career. The purpose of this research was to study the effects of team teaching upon two 8th-grade teachers in the field of mathematics. The specific research question was student performance and teacher perceptions concerning team teaching. Team teaching involves two or more teachers whose

primary concern is the sharing of teaching experiences in the classroom, and co-generative dialoguing with each other. They take collective responsibility for maximising learning to teach, or becoming better at teaching, while providing enhanced opportunities for their students to learn. The subjects of this experiment were chosen from the 8th-graders of a secondary school in Taoyuan County, Taiwan. Two certified maths teachers and four classes participated in this study. One each of the teachers' two classes was selected to be the experimental group (63 pupils), and the remaining two classes (61 pupils) were the control group. The researcher made use of a quasi-experimental method, assigning the four sampled classes to experimental group and control group. This study was a two-stage team teaching experiment, dividing the 12-week period into two equal halves. The main research method was a combination of quantitative and qualitative analysis. The research data included student scores, questionnaires, teachers' self-reflection, video taped records of teaching performances and the researcher's interviews with teachers.

The research findings showed that the average final exam scores of students receiving team teaching were higher than those of students receiving traditional teaching. The two teaching methods showed significant difference in respect of students' achievement. More than half of the experimental students preferred team teaching to traditional teaching. The discrepancy between team teachers' expectations of team teaching and its implementation was apparent. The differences in the teaching strategy also exposed team teachers to challenge and being compared with each other by students in class. Besides, the team teachers had been unprepared for this comparison, especially in regard to class management. The implementation of team teaching, however, did not win the support of the school administration, which impeded teachers in holding team meetings and caused students doubts regarding team teaching. Since the research concentrated on a single subject, the implementation of team teaching in the field of interdisciplinary courses is needed. The key to this lies with teachers, who are required to do this actively; otherwise, educational reform will not achieve its goals.

In a literature review for BECTA, Cox et al (2003) conclude that while there is ample evidence of good practice in the use of ICT in schools, the barriers to change remain a lack of clarity about the best pedagogical approaches. They argue that if teachers' pedagogies are to change in ways which support the use of ICT in classrooms, their ICT skills must be developed alongside their pedagogy. If this does not happen, then ICT will be a superficial add-on to the learning and teaching process.

Webb (2005) looked at the impact on pedagogy of the use of ICT in science in England. She argues that ICT-rich environments in science can promote cognitive acceleration, enable students to link science learning to other real-life experiences, increase students' self-management and facilitate data collection and presentation. Her article is essentially a literature review, and her synthesis leads her to conclude that positive outcomes in terms of pupil attitudes and teacher behaviours occur when ICT is used well in science classrooms. To enable all science teachers to benefit from such pedagogical gains, she concludes that not only must the hardware be available, but that training, CPD and confidence to use the technology are key.

Abrahamson and Söderling (2005) describe a pilot study regarded as the start of a three-year long research project aiming to reveal how to develop teaching and learning to be more meta-cognitive from the perspective of young people. The case study is located in the Swedish nine-year comprehensive compulsory school and concentrates on life in the classroom from a student's point of view. The object of the study was to consider the possibility of creating a social environment in classrooms which supports students' confidence in their interaction and learning in order that they can develop a more self-reliant and meta-cognitive attitude to learning. The participating students were between 14 and 15 years old. A number of lessons were observed with field observations and a number of interviews undertaken with students.

Some conclusions can be made from the pilot study:

1. A well-laid pedagogical plan that starts with the students' interests and level reaches close to the goal where the students do their tasks even without direct teacher supervision.
2. Students who found it difficult to plan/realize their schoolwork are often excluded even in a pedagogical attempt where the goal is that all students' way of learning should be supported.

Another focus that has been obvious in the pilot study is how the teachers should act in order to strengthen the meta-cognitive learning in the discussion with the students.

4.8 Assessment

As indicated above, the issue of assessment is high on the change agenda in Scotland and elsewhere. Crooks (2002), writing from the perspective of New Zealand, a country with very similar numbers of schools, students and teachers to Scotland, argues that changes which

affect assessment are more difficult to achieve in the secondary school environment. In 1991, the curriculum was reformed on the model of the National Curriculum of England and Wales. This caused resentment among teachers because of a belief that it stemmed from a lack of trust in them. Throughout the 1990s, the curriculum and assessment became more prescriptive and centralised.

Recently, a radical departure has been trialled involving new assessment activities such as one-to-one interviews, teams, stations and independent learning videoed by teachers. This is an attempt to move towards criterion referenced assessment, encouraged by a view of assessment not dissimilar to that of Assessment is for Learning. However, Crooks is sceptical of its likely success in secondary schools because of high stakes exams and a system founded on accountability.

Harlen and Deakin Crick (2003) reviewed the literature on the relationship between assessment and testing regimes and pupil motivation. Among their implications for practice are that some of the most prevalent of practices associated with tests need to stop, including forcing pupils to take tests which they are sure to fail, ceasing the drilling of pupils in test practice, de-emphasising the importance of tests through use of formative assessment practices and avoiding the narrowing of teaching approaches because of the format of the tests. More positively, they advocate more CPD to allow teachers to make these changes; school policies which emphasise the range of assessment practices and purposes; sharing with learners the roles of assessment, including peer- and self-assessment; avoidance of pupil comparisons purely on the basis of test scores and promotion of more independent and self-regulated learning.

They also make suggestions about changes in policy. They propose the reduction of the impact and importance of high stakes testing. They cite the PISA study (2001a) which shows that pupil commitment to learning, ability to use a range of strategies and their level of interest, are associated with improved achievement. Externally imposed targets, they conclude, citing the then HMSCI, David Bell, may inhibit the schools' capacity to improve learning. Gamoran, an American academic who has worked in Scotland, is quoted by Ayalon (2006) on the success of Scottish curriculum reform being the result of its close link with assessment and certification.

At a policy level, "National Assessment and Grading in the Swedish School System" (Skolverket, 2005) describes the changes in the school system since the War and focuses on the present system, in effect since 1994. In the more de-centralised system, all schools

have a curriculum which has two sets of goals: goals to strive towards and goals to attain. The former give guidelines for the direction of teaching; the latter outline knowledge and skills to be attained by the end of courses. In the secondary school there are 8 core subjects but theoretically a total of 870 courses available. Grades are used throughout the system and failure to achieve certain grades at key points in a child's school career may mean failure to move on with peers to the next level. It is acknowledged in the document that, in upper secondary, grades are "a sorting instrument for higher education".

The document goes on to itemise the possible negative effect of high-stakes assessment and grading (e.g. teaching to the test) and advises that these should be avoided. It states that Swedish teachers do not share the opposition of their counterparts in other countries to national tests and there is evidence that stakeholders like them. The document concludes by suggesting that some of the political parties on the Left are unhappy with the current approach to assessment and grading and that change to a more formative emphasis for assessment is possible in the future.

4.9 School size

Berry and West (2003) conducted a survey of data in the US on the relationship between school size and student achievement. In their non-technical paper they found that students in states with larger schools completed fewer years of schooling, even when socio-economic status is controlled for. Student achievement in turn led to higher earnings on average for pupils in these states. However, their conclusions are qualified by the fact that their data is not recent and they make no attempt to explain why it is that smaller schools do better on these criteria.

Lee (2004), working in Michigan, USA, writes both about the research evidence on the relationship between school size, organisational structures and student achievement, and about the dangers of implying causal relationships when only correlations are presented. Her choice of factors such as restricted curriculum, inability to attract staff and lack of opportunity to track (stream) students gives some indication of where she stands on small rural schools. However, her academic opponents, to whom she addresses her paper, are much more positive about the capacity of small schools to be successful. As with class size and setting, the evidence from research is not totally conclusive one way or the other, but there is enough evidence available to prevent any one view being imposed as a 'default position'.

The 2000 Ofsted report survey, *Small Schools: How are They Doing?,* suggested that "a good case emerges for the place of small schools in the education system when the quality

of their educational performance is added to the broader contribution they make to their communities". In a report in the Times Educational Supplement (6th October, 2006), Haigh argued that "there is no evidence that there is a viable roll size for an effectively led school."

Research on school size is growing. Garret et al (2004) writing from a UK perspective say that there is no consistent evidence linking school size and attainment but that student engagement and participation is greater in smaller schools. Nathan et all (2001) suggest from a US perspective that small schools can make positive alliances with libraries, museums, local businesses and day care centres to extend provision for students. Steifel et all (1998) and Wasley et al (2000) focus on cost-effectiveness of small schools in terms of lower drop-out rates. Elsworth (1998) found that in Australia while there appeared to be a positive correlation between school size and number of subjects on offer, uptake rates in bigger schools were often low. This study claims that diversity and choice can be features of small schools.

4.10 School buildings and design

Kirkeby's research (2002) describes the Nordic "School of Tomorrow" network of educational buildings. It is commonly agreed among the Nordic countries that no one optimal school exists, but that there are many suitable architectural answers. The Network, established in 2000, meets once a year to exchange and discuss knowledge, experience and ideas concerning school buildings and to collect knowledge in special fields. Members are Denmark, The Faroe Islands, Finland, Greenland, Iceland, Norway, Sweden, and Aland. The Network has made a list of urgent research topics related to educational facilities, and is planning ways to promote and support research in educational facilities issues. As an example of how one Nordic country is trying to increase knowledge about good schools, the paper describes the Danish initiative "Rum Form Funktion," which is an alliance of the Ministry of Education, Danish National Research and Education Buildings, and Danish Building and Urban Research. One of the initiative's projects has been supporting architectural competitions for school design.

In England, the publication *21st Century Schools (Building Futures, 2004)* drew on a literature review of building including two OECD reports, *What schools for the future?* (OECD, 2001b) and *Designs for Learning* (OECD, 2001c), and concluded that designs of new schools should be "flexible in use, occupancy and layout"; "inspiring and embodying organisational aims"; "supportive to effective learning and teaching"; and "involving of the users and the wider community and linking to other learning places". The report offers models of schools for the future, including the extended school and the dispersed school.

Fundamentally, it suggests that school buildings are an important element of curriculum architecture, literally and figuratively, and that any fundamental curriculum reform can be enhanced by having buildings which are in tune with the philosophy of the new approach.

In Scotland, "The 21st Century School: Building our future: Scotland's School Estate" (Scottish Executive, 2003) considered a number of curriculum architecture-related issues and related these to existing policy documents and processes. The document was aimed at local authorities in the first instance, but also at stakeholders who might be concerned that new school buildings might fail to take account of existing policies affective the education of children and young people.

In 2001, New Zealand's Ministry of Education commissioned a document entitled "New Secondary Schools, Consultation Project" as it prepared to build the first two new secondary schools in 20 years. The document was produced as the result of a literature review, interviews with stakeholders, an interactive website and focus groups. The literature suggested that "schools are effective learning environments when they:

- Enhance teaching and learning and accommodate the needs of all learners
- Serve as centres of the community
- Result from a planned design process involving all stakeholders
- Provide for health, safety and security
- Make effective use of all available resources
- Allow for flexibility and adaptability to changing needs."

They argued that the design process should start from educational principles and found that "although there has been little research into links between learning and design, four elements appear to be predictors of successful student learning outcomes: technology for teachers; clearly defined pathways for movement around the school; a positive, friendly and welcoming atmosphere; and a positive relationship with the outdoors, so that the school sits comfortably in its environment."

They ranged over a large number of issues, from pedagogy to extended community use. They looked at issues of size of school and suggested that "many of the schools referred to in the literature had large rolls, which were considered too large to be efficient or friendly. To enhance the safety of students and to facilitate administration, many schools organised and housed students in groups of no more than 300-400 – a "school within a school". Schools had a variety of ways of achieving this, e.g. by separating new students … into separate

buildings, by clustering classrooms into a collective “neighbourhood” or by providing separate buildings for houses. They suggested that “rather than providing single subject departments, the concept plan needs to consider a faculty approach, which groups linked subjects (e.g. a science faculty encompassing biology, physics and chemistry or a social science faculty including history, geography and social studies)”. The report, some 177 pages long, looks in detail at the two specific schools and how they can meet the needs and reflect the aspirations of their respective communities.

Bishop (2001) uses a case study approach to consider how school building design can enhance or hinder inclusion of pupils with special educational needs (ASN). Drawing his examples from early years through to secondary, he argues that full inclusion is more than simply the ability to move around the building freely. It means access to appropriate learning spaces and if necessary purpose-built work stations and inclusive social areas for non-class times. He suggests that the implications for pupils with additional support needs should be considered in terms of the learning environment when any curriculum change is being planned, not as an afterthought.

4.11 Teacher perceptions and beliefs

In a study carried out in Hong Kong, Cheung and Hin-Wah (2002) developed an inventory for measuring teachers’ “curriculum orientations” on the premise that they affect how curriculum is delivered within schools. Their sample was 648 teachers and they concluded that there were five distinct curricular orientations – academic, cognitive process, social reconstruction, humanistic and technological. They argue that, since they found no consistency of teachers’ beliefs across schools, subjects or gender, no curriculum reform based ideologically on any one belief system is likely to find universal favour among teachers. Instead, they argue, reform must engage teachers in discussion about their beliefs and about the philosophy underpinning the changes. They argue that since curriculum includes not simply content but the way it is organised, what is emphasised, how it is taught and how it is assessed, then teachers’ beliefs will influence their commitment to any curriculum reform. In other words, teachers’ beliefs are an important aspect of curriculum architecture.

In Australia, McCormick *et al* (2006) have developed a model based on questionnaire data from 2,345 teachers across 40 secondary schools. Their conclusion is that a ‘one-size fits all’ approach to curriculum change is unlikely to be as successful as one which tries to meet the needs of teachers. Teachers react to change in complex ways and the perceived stress associated with the specific reform may be compounded by other, more enduring stresses,

such as bureaucracy, accountability, pupil motivation, etc. In other words, they do not see the reform as a *tabula rasa*. The problem is that their coping strategies may be compromised by their more general view of their professional tasks and they engage in palliative activities rather than problem-solving activities. In the Scottish context, there is a danger that teachers may have become de-skilled and may have lost confidence in themselves after decades of accountability and centrally directed change.

4.12 The extended school

In Scotland, the extended school has antecedents in community schools in the 1970s and 1980s when the two largest local authorities, Lothian and Strathclyde, developed quite different models. Alongside this development, Strathclyde pioneered an adults-in-schools policy in parallel with the establishments of all-year-round pre-5 provision. In the 1990s, Scotland turned its attention to the US, where the concept of the full-service school was developed (Dryfoos, 1994). This interest led to the establishment of New Community Schools in 1999, which in turn became Integrated Community Schools. The concept has proved difficult to sustain in its various manifestations, partly as a consequence of pressures on funding but also as a result of the inability of different agencies and departments to work together in meeting the needs of vulnerable children.

In 2002, Grossman *et al*'s evaluation of the Extended Service Schools (ESS) in the US found that:

- demand from parents and community members was high
- student after-school participation was high
- students who are non-joiners need to be targeted
- programmes which demanded commitment over a number of weeks were less successful
- quality of staff was key
- student behaviour improved with participation
- school districts had to be supportive
- fund-raising took up huge amounts of time
- choice of programmes improves uptake
- community ownership of the initiative is key

Clemens *et al* conducted an extensive study of provision extended schools in England in 2005. The extended school, to be universal by 2010, is to offer services from 8am until 6pm each day, to provide family learning opportunities, to be a one-stop-shop for related child-

care and social services and to enable the local communities to make widespread use of the school's facilities. Almost 4000 schools from across all sectors took part in the telephone survey to establish the level of provision in 2005. The position is set out by sector and by aspect of the extended school but no analysis of the data is provided. There are variations geographically, by sector and by aspect of provision. The only conclusion possible at this stage is that universal provision will be problematic by the target date.

Cummings *et al* (2004) produced an evaluation of the Extended Schools Pathfinder Projects in England. The evaluation made the link between extended schools and 'full-service schools' and the study of some 200 establishments found 'patchy' development. However, in the most successful schools the authors found that stakeholders were close to being able to "articulate a theory of change". They concluded that, if extended schools are to succeed, then the architecture, in terms of 'leadership structures', partnerships with other agencies, support from local authorities and genuine community involvement, will require significant lead-in time and consolidation into mainstream school organisation from their current 'project' status. A year later, the evaluation of the first phase of the project, carried out by Cummings and other colleagues, confirmed the above findings (2005).

In the US, the coalition for community schools, an alliance of 160 state and national organisations, produced a review of current evaluation findings on the impact of community schools (Blank *et al*, 2003). The factors associated with student achievement were found to be:

- a rich curriculum with effective instructional challenges
- strong leadership and clear vision
- small schools and small classes helped particularly inner city, minority and low-income children
- learning which is concrete and active
- students personally involved in and committed to the learning
- the community as a 'living textbook' for learning during and after school
- enrichment activities that enhance rather than replicate classroom learning
- comprehensive school-based health care enhances achievement
- mental health services improve student achievement
- nutrition and exercise improve student achievement
- active parental involvement predicts school success
- respectful co-operative relationships helps family members connect with the student's schooling

- when families are supported in their parenting role, student achievement improves
- consistent parental involvement at every stage is associated with student success
- young people who feel safe, connected and accepted do better in school
- caring relationships and high expectations are associated with success
- community engagement improves school climate
- the condition of school buildings has an impact on student achievement

The report claims that each of the above statements is supported by research from around the world on school effectiveness and it contains a number of appendices of case studies and community school evaluations.

Duckworth's Notschool.net Evaluation 2005 offers some empirical evidence of the effect of alternative provision, an 'online learning community', for young people who do not cope with school or complementary arrangements such as home tutoring or specialist units. Qualitative and quantitative data, triangulated with proactive ethnography, were collected and key findings were reported in relation to: engagement, improved levels of literacy, improved social skills, improved self confidence and ambition, rebuilt self-esteem, development of high level ICT skills, formal accreditation, empowerment, communication and collaboration and problem solving. Notschool.net is a virtual online community offering an alternative to conventional classroom-based education for young people. It is a last resort for disengaged young people, typically aged between 14 and 16 years, and does not aim to return participants to school but is a route to further or higher education or employment. Online communities are set up and mentors devise individual plans. Work is presented as documents or pages which are accessible only to the mentor, Team Leader and curriculum expert. These local teams of three work with cohorts of between 40 and 60 participants called 'researchers'. Successful researchers may remain in the community to act as 'buddies'.

4.13 Programmes for pupils experiencing failure at school

Vallinas *et al*'s (2003) study was undertaken between October 2002 and April 2003 in a secondary education school in a town in the province of Cadiz, in Spain. The intention was to analyse and understand the educational practices used in an innovative scheme entitled the Social Guarantee Programme. The group who participated in the study were from the Professional Initiation Social Guarantee Programme. Following ethnographic case study methodology, the work of a specific teacher, head of one of the programmes, was

considered. Data-gathering techniques of surveys, observation and interviews were employed. A survey of the families was analysed in order to ascertain the general profile, and the pupils were also surveyed in order to identify their general motivations and interests. A systematic observation process was followed in the classroom and in the communal areas of the school. Over the period of this process, and as questions arose out of the analysis that was under way, key informers from the group were selected for in-depth individual interviews. The teacher was also interviewed during the course of the process in order to record his point of view on the significance of the educational practices that were being observed.

Among the measures aimed at fostering diversity within the Spanish Educational System are the Social Guarantee Programmes. These give young people who have not successfully completed their schooling the opportunity to acquire skills to facilitate their integration into the labour market or to allow them to return to the educational system and take Specific Vocational Training. Social Guarantee Programmes last between six months and two years. The most common type are those run in secondary schools, which are the Professional Initiation courses, and which last one school year, with thirty hours teaching per week.

Although vocational and academic training is important in these programmes, no less important is the personal development of the students. Curricular structures which are inflexible, which are not differentiated and which cannot be adapted do not appear to be effective. Neither are closed organisational structures helpful.

The fundamental objectives of Social Guarantee Programmes are:

- to widen the students' training
- to train them for work
- to develop and achieve personal maturity through habit and skill-building at will allow them to participate in social and cultural life as workers and as responsible citizens

Different types of Social Guarantee Programme have been established:

- *Professional initiation*
- *Training-employment*

- *Professional workshops*

Planning is undertaken with the demands and needs of students at the core. The teacher assesses the skills of the students, analyses the conditions under which they have so far studied, the response given to them by their different schools of origin, their personal interests and characteristics, their family situation, and so on. In the teacher's view, one of the key reasons why this measure proved successful is that the academic work that is done reflects the students' needs.

Among the general principles on which the action is based, two are highlighted: firstly, the principle that this action is a question of social and curricular justice; and secondly, that the students are all different, and they learn according to their own individuality and their family, social and school situation.

One of the most striking aspects of this programme is that the traditional school patterns, those which provoked such hostility among these students, seem to have been broken. It seems that from the very beginning, they have been made to understand that being and working in the Social Guarantee Programme is completely different from their previous school experience. Timetables are flexible, different subjects are not taught at fixed times, but are taught in an integrated manner, and a task can be interrupted if part of the group thinks that that is appropriate. They are given work that must be completed within a given time. The work is taken from different subjects and consists of varied contents, and the students can organise it as they prefer. They can talk in class as they work without reprimand. They can leave the classroom whenever they like, provided that they do not interrupt the work being done, they can sit where they want and with whom they want (if they want to sit down). They feel free to propose different activities to be carried out by the whole group... In short, they are being given the means to develop the potential of their own capacities and effectively channel all of their accumulated energy, including that which they directed against the educational system.

4.14 Subject-based and inter-disciplinary models

New Basics is an initiative which seeks to provide a framework for curriculum, pedagogy and assessment in Queensland. The curriculum is formulated around four organisers (rather than the pre-existing 8 Key Learning areas):

- Life pathways and social futures

- Multi-literacies and communication
- Active citizenship
- Environments and technologies

Pedagogy is clustered around the following principles:

- Intellectual quality
- Connectedness
- Supportive classroom environments
- Recognition of differences

Assessment is done through “rich tasks”.

The research (Ainley, 2004) looked at 38 schools which trialled New Basics from 2001 to 2003. Early results are promising though the researchers argue that they cannot as yet be regarded as conclusive. They suggest:

- *Rich tasks and student work* – most progress has been made in Year 6 (Primary 7), with some evidence also in Years 7 and 8
- *Teaching and learning and classroom environment* – pupils and teachers report that this has improved
- *Student achievement* – no evidence as yet either of improvement or decline
- *School satisfaction* – higher in primary schools than in secondaries

.

Among the strengths of the initiative indicated by the respondents were:

- Quality of pupil work, especially in Year 6
- New assessment system developed around Rich Tasks has had an impact on classroom practice
- Changes in approaches to teaching have been variable
- No firm evidence of improvement in literacy or higher order thinking yet
- Changes were needed in timetabling, space utilisation, subject availability and budgeting. The impact on traditional subject disciplines remains to be addressed.
- The impact of the initiative is most positive in upper Primary.

Writing from an American Elementary School perspective, Akins and Akerson (2002) explored the practice of delivering the curriculum in an interdisciplinary way. They found that when the curriculum was delivered in an interdisciplinary way, students scores on content within the individual subject areas were high, indeed, were higher than the students normally scored on such tests. They found that in parts of the topic where pupils were engaged, they tended to work more independently.

The authors were surprised at the lack of understanding students had of the individual disciplines before embarking on the project. They conclude that although students may be taught in individual subjects, they do not necessarily understand what these are or the differences among them. Paradoxically, their research shows that within an interdisciplinary framework, students can be helped towards a greater understanding of disciplines.

Meister and Nolan, (2001) describe and interpret the change process involved in moving from subject-based to inter-disciplinary working. They consider how five teachers of high school freshmen defined and made meaning of a change process in which they were involved. Although several interrelated themes emerged, uncertainty and doubt became the pervading theme that had a critical and sometimes debilitating effect on the teaching team's ability to move from subject-based to interdisciplinary teaching. This uncertainty and doubt was magnified and perpetuated because of the deficit model utilized to implement the initiative: lack of teacher input into decision to restructure, the school's history of adopting trends, lack of professional development, lack of a written curriculum, lack of administrative leadership, and the pull between loyalty to subject and allegiance to team.

Stevens *et al* (2005), in their “comparative understandings of school subjects”, looked at how learners perceive subjects and the connections between them and drew conclusions about how a middle ground between subject-based and inter-disciplinary approaches might be achieved. They quote Melissa, a fifth grader who asks her teacher, “this morning we learned about plants and you asked us to think about *causes* and *evidence.* You said the same thing when we read about the Civil War. Do these words mean the same thing in Science and Social Studies?”

In reviewing the literature, they find that many so-called *inter*-disciplinary approaches are actually *pre*-disciplinary, i.e. they do not draw on features of disciplines that lead to conceptual and practical advances in knowledge. They also find that students are left to try to make the connections among subjects by themselves, caricatured by “first we do English, then we do Maths, then we do lunch.” What are the connections? They draw on the work of

Jerome Bruner, a pioneer of inter-disciplinary approaches within the Social Sciences, and of Paul Hirst, whose forms of knowledge were characterised by distinct conceptual frameworks.

Their classroom-based study focused on Promoting Argumentation Through History and Science (PATHS). They videoed lessons, and interviewed students and teachers. Their conclusions are disappointing from a policy perspective since they argue that research at present has little to say about how best to help learners make connections across subjects, other than that if learning is to be coherent then it cannot be left to chance or simply to the pupils themselves. It has to be planned and has to be built on a clear understanding of the core elements of disciplines and their interactions.

Gardner (2006) argues from a 'disciplined' perspective and poses some challenging questions about the rationale for inter-disciplinary approaches to the curriculum. He challenges curriculum planners to ask what the gains are when promoting inter-disciplinary approaches. He is not against them but feels that the case needs to be made for the synthesis which can effectively be achieved through inter-disciplinary approaches.

Looking at the related topic of key skills, Whitson (1998), in a policy-oriented article, has sought to clarify some of the issues. He warns against key skills being reduced to competences and simply bolted on to existing subject syllabuses. He reminds us that key skills are about processes, not simply outcomes, and that the nature and quality of the learning experience, and of the pedagogy, are key to the transferability of key skills. Active learning for him is the key; it is not about replacing content with skills, but about changing the relationship within the two. Such an approach makes different sorts of demands on pupils, teachers and on school organisation and timetables. Opportunities for pupils to be engaged, self-consciously, in learning to learn, is the key aim of such an approach and it is what the curriculum ought to be trying to facilitate.

An American study of interdisciplinary approach and problem-oriented instruction, 'Three strategies for interdisciplinary teaching: contextualizing, conceptualizing, and problem-centring' (Nikitina, 2006) focuses on a number of levels of institution including the 'pre-collegiate' or high school, of which 4 are included in the sample. Data were collected during 2001-02 and involved 23 classroom observations, interviews and discussions, and examination of student work. The purpose of the investigation was to compare pedagogical design based on traditional disciplinary curriculum and design based on integrative teaching strategies. The findings suggest that connections can be built among different disciplines where a 'contextualizing strategy' is employed, though a weakness is that the connections

may be arbitrary and speculative. While this approach does not typically lead to mastery of disciplinary practices, contextualizing helps to situate the practices in a broader philosophical or historical framework. Conceptualizing builds coherence among facts and practices but the connections may not be broad or far-reaching. Problem-centring also forges connections among the disciplines but may render deep and broad exploration of the discipline impossible.

Quicke, Professor of Education at Sheffield, in a policy-related contribution, "Key Stage 3: an alternative strategy" (2005), suggests that some subjects such as English, maths, science, geography, history, citizenship and religious education, should "give up some of their 'space'" to enable the creation of a radical form of PSHE, and cites the DfES website which suggests that these subjects do not have to be taught separately at Key Stage 3. He argues for 'cross-curricular themes' which would allow person-centred and enquiry-based learning which would nurture personalised learning and promote thinking skills. He argues that it would provide a more cohesive approach to learning, avoid duplication and promote transfer of skills and learning. It would be a non-examination subject (to avoid the pressures of high stakes testing and narrowing of content and pedagogy), but would contribute overall to the raising of achievement in schools. It would be complementary to existing subjects, not an alternative. He suggests that the dominant pedagogy would be 'dialogic', with enquiry and collaborative learning at the centre. It would be timetabled on a daily basis and the PSHE teacher (existing teachers who would receive additional CPD) would form dual academic and pastoral bonds with the pupil, thus smoothing transitions within the school system.

Quicke ends by acknowledging the many barriers that would lie in the way of such a proposal but offers it as a starting point for discussion as schools in England consider the flexibility offered to them within Key Stage 3.

4.15 Class size

The issue of class size comes at the end of this section of the report not because it is the least important but because it has recently been the subject of a literature review by Wilson (2006). She found that the evidence on class size was extensive and that some of it was very good. However, benefits are most often measured against a narrow set of outcomes, normally English and maths. She makes particular reference to two recent studies in England and observes that there have been no similar studies in Scotland. The evidence from research in the United States (Illig, 1996) in the early years of primary school is that pupil attainment generally increases as class size decreases. However, as Wilson (2006) points out, the practice in Britain of putting pupils deemed to be 'less able' learners in smaller

classes, prevents that same conclusion being drawn for secondary schools in this country. There is disagreement as to the extent of the reduction required to effect a significant improvement, but the consensus is somewhere between 15 and 25, with achievement among lower attaining pupils improving most significantly. Changes in teaching methods, pupil learning and pupil behaviour were all observed in the literature when class sizes were reduced. However, the picture is a complex one and most researchers argue that it is not simply the reduction in size, but the improvement in quality of the learning and teaching which can happen as a result, which is the key.

4.16 Conclusions

While, at the outset, the term "curriculum architecture" did not appear a fruitful field for a literature review, it has, nevertheless, thrown up a considerable, if patchy, body of research- and policy-based literature. In some cases it was not that there was no body of literature; it was often that the literature was not specifically related to curriculum architecture (e.g. much of the school effectiveness literature looked at outcomes and related them to broad in- and out of-school factors). In other cases, there appears to be a genuine gap in the research literature.

However, from the literature surveyed it is possible to draw the following conclusions which might inform the debate.

- Secondary school timetabling should facilitate learning rather than organisational efficiency. The flexibility offered by *A Curriculum for Excellence* should be used to ensure that the length of learning episodes is related to the desired pedagogy. Any flexibility offered to schools may not be taken up unless they are confident that the system of accountability will recognise diversity.

- Choice and personalisation will only lead to improved achievement and engagement if pupils are active participants in the process and if it is given high status in schools and beyond. Greater choice may favour those most able to exercise it unless schools offer support and guidance in the process. If low attaining pupils are simply given low-status choices, they will not make the progress of which they are capable. Choice needs to go far beyond simply choosing courses; it must be part of the culture of the school and should extend to core activities such as learning and teaching.

- The issue of class organisation is a contentious one. Some researchers report an increase in the use of setting but suggest that there is no discernible increase overall in (GCSE) results as a consequence. There are, however, differences in attainment among pupils of similar ability placed in higher or lower sets. Concerns are raised within research which looks at the relationship between setting and variables such as socio-economic status, gender and ethnicity (and age). Pupil attitudes to setting vary from study to study, with most expressing concerns and anxieties, but few schools take pupils' views into account when organising classes or evaluating the success of the process. Pedagogy emerges as a key issues in some of the studies since setting appears to narrow the range of strategies used. Teachers' use of within class grouping in secondary schools is not well represented in the literature, though one study found little relationship between forms of grouping used and theories of learning.

- Ethos and culture are well represented in school effectiveness and school improvement literature and since Rutter (1979) have been identified as a key factor in school success. There are few studies which explicitly link these factors with curriculum architecture. One issue for future research is the link, if any, between ethos and achievement, since the literature is stronger on the link between ethos and pupil engagement.

- The impact of the curriculum on subgroups within schools is a key issue when considering curriculum architecture. A recent Scottish review on the issue of gender has concluded that the issue is more problematic in secondary schools, that it should have a clearer policy focus than at present in many schools and that CPD for staff is a key element in addressing the impact of school structure, curriculum and pedagogy on boys and girls. The research literature on gender is strongest in Australia, where a number of extensive studies have been carried out in recent years. The conclusions are that young women need considerable support to realise their potential, and relationships, pedagogy, CPD and the creation of 'professional learning communities' are among the ways being proposed to ensure that gender is in the forefront of decision-making in the context of curriculum architecture. School size emerges as a factor, with smaller schools more likely to narrow the gender gap. However, it is teacher- and class-level factors which are the most significant. A small study in Scotland reinforces these findings, highlighting CPD, positive role models,

pedagogy and school policies as key ingredients in any approach to tackle inequalities in achievement.

- The issue of ethnicity has been studied in England in recent years. The twin issues of fluency in English and gender have been singled out in the literature as being pupil-level characteristics associated with success or failure. At the school level, many of the issues associated with gender emerge in the context of ethnicity. Personalisation of the curriculum, appropriate and varied pedagogies, partnerships with parents, mentoring of pupils and CPD are the elements schools must address. A relevant and inclusive curriculum is the key, according to a 2003 DfES policy document which covers much of the ground of the research but which also goes on to advocate citizenship as a vehicle for addressing issues of ethnicity and underachievement. The overall sense is that policies should not, deliberately or unwittingly, separate pupils, but should empower them and their families to take part in the decision-making process in relation to school policies and systems.

- Since the publication of *A Curriculum for Excellence*, increasing attention has been focused by politicians in Scotland on the so-called "bottom 20%" and the NEET group (Not in Employment, Education and Training). The research into vocational education taking place across the world, most notably in Australia, England and Canada, is relevant in this context. The Australian studies conclude that there are problems of organisational culture at the school level which continue to make it difficult for vocational courses to have parity of esteem with academic. There is teacher resistance and a tendency to offer such courses only to the 'less able'. However, there are many examples of good practice across the country where goodwill and open-mindedness are in evidence. In Canada, the phrase "bottom 15%" is used and successful, middle class schools can be resistant to the importance of vocational courses. It is advocated that schools have a broad, general curriculum with vocational options suited to all levels of ability. In England, success has been identified when programmes focus on partnerships between schools, other providers, business and parents. The problems lie with sustaining, embedding and disseminating good practice and with ensuring that work-based qualifications gained by young people are recognised and valued by the school and by further and higher education.

- It is arguable that pedagogy is the key element of curricular architecture. It is linked with many of the other elements and is the context within which pupils and teachers come together to promote effective learning and teaching with a view to maximising the potential of every learner. Hart *et al* (2004) make the strongest case of all for a pedagogy "without limits" while studies from as far afield as Taiwan suggest that teachers teaching together in teams, collaborating in improving learning and teaching, is associated with improved pupil outcomes. Black and Wiliam (1999) have led the way in focusing on the link between pedagogy and improvement in pupil achievement. Most educationalists would argue that meta-cognition is the key aim for all of our students. A Swedish study concludes that, if this is so, then the students must be co-agents in this endeavour and that all teachers and all students should be involved, irrespective of background or ability. The role of ICT in learning is dealt with in the literature, sometimes generically and sometimes by subject. In both cases, the conclusion is that the hardware is less important than the pedagogy and that teacher CPD and collaborative working are more likely to ensure effective use of the technology.

- Linked closely to pedagogy is assessment. Black and Wiliam (*op cit*) have led the way in recent years in establishing this link. Across the world, developed countries have been attempting to do the same. However, as they have found in New Zealand, secondary schools, with their high stakes, summative assessment focus, are the most difficult to change to formative assessment practices. Studies in England suggest that change will only happen when teachers are confident enough to engage with pupils in discussions which lead to peer and self assessment, which de-emphasise marks and grades and which focus on assessment for learning. CPD for teachers emerges from the literature, along with pedagogy, as a key issue in this regard. PISA (OECD) studies are cited to support this viewpoint and the former head of Ofsted is quoted making the case for formative assessment. An extensive Swedish policy document gives a historical review of the importance of assessment and grading in their school system and the attempt to move in the 1990s to a less formal and more formative approach. They suggest, however, that as long as grades are part of the higher education 'sifting process', they will remain influential in the school system.

- The issue of school size is not one on which there is conclusive evidence. As with class organisation, the evidence suggests that there is no one default position.

There are many articles, which do not have an empirical basis, in which proponents argue that small schools should be supported. Recent articles in TESS, drawing on Ofsted reports, support the view that small schools have as much right to existence as large schools. The issues of ethos and culture are felt to balance any claims that larger schools can offer a broader curriculum. Indeed, in the secondary sector, larger schools often offer more sections in each subject area, rather than more subjects, to pupils. The issue of 'viability' is much less clear cut than the proponents of large schools would suggest.

- The issue of school design is not well covered in the research literature but is the subject of policy-related documents in England and Scotland. There have been attempts made by governments to remind planners and policy-makers to take account of existing policies when planning new schools. Work done in New Zealand suggests that when large (mostly secondary) schools are being built, consideration should be given to creating schools-within-schools, of around 400 pupils, to ensure that no child is lost in the system. In Denmark, there has been a commitment to ensure that no school will be built without reference to international research on school design.

- Teacher attitudes and belief systems have been shown to be crucial aspects of curriculum architecture. Since all teachers do not share the same belief system in terms of pedagogy, it is important that change at a system level engages with teachers. It cannot simply impose a change without causing teacher stress and alienation.

- Scotland pioneered the notion of the integrated (new) community school, drawing on research in the US on "full service schools". The research in this area is mostly drawn from the US and England. In the main, the extended school concept, with a collaborative ethos across agencies and organisations with an interest in young people and their families, is positive. Schools which extend outwards into their communities, and inwards in terms of the curricular and extra-curricular services offered, have been successful and are offered as a model in terms of reaching the least advantaged young people in our school system.

- The issue of young people who tend to fail in school is not yet prominent in the research literature as far as curriculum architecture is concerned. One Spanish

study provides a model which appears to offer insights into empowering the most disaffected young people in our schools.

- The research evidence on inter-disciplinary as opposed to subject-based approaches is not conclusive, but is nevertheless persuasive. If cohesion is a principle, if making connections is a key part of learning and if transfer is an aim of learning, then inter-disciplinary approaches should, at least, have equal status to the subject-based approach. Inter-disciplinary approaches are proposed as a means to allow learners to make connections and to transfer skills. However, the barriers in the system, not least from subject-based vested interests have to be acknowledged. The consensus from the research suggests, as Gardner has argued, that while inter-disciplinary approaches must be based on a convincing rationale, they can offer opportunities for 'joined-up' learning which subjects cannot always offer.

- The issue of class size has been dealt with elsewhere. Suffice it to say that the American evidence on the value of reducing class sizes has grown in recent years and that the reduction must be significant and should begin early in the learner's school career. The UK evidence is less clear cut because of the practice of putting lower-attaining pupils in smaller classes.

- It is difficult to make a convincing case that the evidence available on the aspects of curriculum architecture signalled in the review specification adds up to a fully coherent body. It is absolutely the case that the evidence presented here points to class organisation, personalisation, pedagogy and CPD as key issues. Equally, there is no evidence in the literature to support the view that the current trend towards reducing the length of time for periods (or episodes) of learning has any basis other than the efficient allocation of teacher non-contact time. Indeed, the key contribution of the literature may be to offer pause for thought to school managers and policy-makers at local and national level before decisions are made which set in train changes in curriculum architecture which may be inimical to the spirit of *A Curriculum for Excellence.*

5. Transitions and transfers

The issue of transitions and transfers is problematic in most advanced schools systems since different sectors often derive from different philosophical and organisational traditions. While most attention in research terms tends to focus on the transfers across the sectors, there is growing evidence that transitions within sectors, from stage to stage, can be just as worthy of analysis.

Interest in early childhood educational transitions tends to be motivated by questions as to whether preschool education makes a difference to later outcomes, and therefore whether there are sufficient links between home and preschool, and preschool and early primary education. Research on transitions in western cultures originally focused on pastoral aspects in order to address children's social and emotional well-being at school start: in a number of cases these researchers have moved towards work on the perspectives of various stakeholders in transitions, most often parents, teachers and children. More recently a focus on transitions in learning and curricular transitions has developed as definition of curriculum in early childhood programmes has become more widespread. The rich and growing literature on early childhood transitions is particularly relevant in relation to a 3-18 curriculum approach.

Studies from across the UK find that the pastoral care surrounding primary-secondary transfer is of a high order and that vulnerable young people in particular receive a great deal of support. However, the complexity of the secondary school system, the continued existence of the 'fresh start' approach and the lack of continuity and progression of learning remain problematic. The link between continuity and progression is not a simple one; some pupils make progress despite discontinuity. The definition of 'progress' may not be shared among teachers within and across sectors. Evidence for the S1/S2 (Years 7 and 8) 'dip' in pupil attainment is not conclusive, but there is stronger evidence for progress being slower than primary data would have predicted.

In recent years, many countries have turned their research attention to the transition from secondary to school to the world of work and to further and higher education. As industrialized countries seek to increase the percentages of young people attending universities and attempt to align school qualifications with the changing labour market, this aspect of transfers and transitions is becoming ever more important.

5. 1 Pre-5 to primary

Interest in early childhood educational transitions tends to be motivated by questions about whether preschool education makes a difference to later outcomes, and therefore whether there are sufficient links between home and preschool, and preschool and early primary education. Research on transitions in western cultures originally focused on pastoral aspects in order to address children's social and emotional well-being at school start: in a number of cases these researchers have moved towards work on the perspectives of various stakeholders in transitions, most often parents, teachers and children. More recently a focus on transitions in learning and curricular transitions has developed as definition of curriculum in early childhood programmes has become more widespread.

Transition to school is complex. The literature on educational transitions in the early years highlights two principal views: those of school readiness and adjustment to school, so promoting a concept of the 'school-ready child', and a newer concept of 'the child-ready school' which promotes a view that the school, learning environments and pedagogical approaches should be ready to embrace the diversity of school entrants.

Three recently published international reviews of early childhood transitions literature are helpful in outlining international perspectives. The first reviews over seventy articles and reports on 'Trends in construction of transition to school in three western regions, 1990–2004' (Petriwskyi, Thorpe, and Tayler, 2005): the regions are USA, Australia/New Zealand, and Europe. The second and more recent review, entitled 'Outcomes of Good Practice in Transition Processes for Children Entering Primary School' (Fabian and Dunlop, 2006), was commissioned by the van Leer Foundation as part of its contribution to the UNESCO Education for All Global Monitoring Report, and reports over 80 studies on early childhood transitions. Fabian and Dunlop provide an overview, from an international perspective, of the research literature on supporting the transition from ECCE to primary school. It identifies issues concerning socio-emotional well-being and cognitive development at transfer from early childhood settings to school, giving the perspective of children, parents and practitioners. It outlines some examples of successful transition initiatives which have enhanced the transition for children and their families and identifies aspects of these in order to draw some implications for policy planning. A third, slightly earlier review by Yeboah (2002) focuses on the importance of enhancing transition from early childhood into primary, discusses the importance of transitions and argues for the need to minimise adverse effects at transition by ensuring a smooth passage form one stage of early education to the next. Taking each study in turn we can identify certain key aspects of the transition to school.

Petriwskyi *et al*'s study concludes that a previous trend to expect homogeneity in school entrants may be giving way to a new recognition that in any community there will be diversity in young children and their families. They see diversity as a positive attribute for teaching and learning contexts. They argue that the likelihood of heterogenous groups of school entrants heralds the necessity of broader constructs of transition to school. As in Dunlop and Fabian's edited collections (2002, 2003 and 2006), these authors are beginning to see the complexity of early childhood transitions, in that they report a shift away from single issues, such as teacher practices, to a multi-faceted perspective. This sits well with Dunlop's (2002a) representation of early childhood transitions as a series of interlocking, interrelated and interactive systems with the family, the early years and the early primary settings being at their centre. Petriwskyi *et al* find that transition time frames have shifted away from attention to the first few days or weeks of school, to an understanding that for some children transition may be more protracted – a concept highlighted by Broström (2003) when he writes about the child as a 'fish out of water' unable to show in the new setting what s/he was capable of in the previous setting. This idea is extended in Dunlop and Fabian's 'Informing Transitions: Research, Policy and Practice' (2006) through a discussion of the social capital – called 'transitions capital' by Dunlop – acquired by children who are supported to make successful educational transitions.

The early childhood transition literature is beginning to focus on children's learning trajectories in the longer term (Dunlop, 2004a). Petriwskyi *et al* focus on broader questions of coherence of curriculum, pedagogy and service systems, and the desirability of authentic partnerships between the families and schools and within educational systems. They highlight that identified trends are not universal, and that the notion of child 'readiness' persists at both policy and school level. Dunlop (2003a), drawing from classroom discourse video data collected in a longitudinal study of continuity and progression in young children's learning, asserts that providing for children's learning at points of educational transition must start with the child. New learning opportunities will be at their most effective when linked to the knowledge and mental frameworks that young children already have (Kagan, 2000). Children's learning can be seen as the acquisition of both factual and conceptual knowledge and a sound curriculum should promote learning how to learn (Kagan and Hallmark, 2002). Each of these three principles combines to emphasise the possible agency of children in their own learning and raises questions about the appropriateness and adaptability of approaches to effective early learning for children in transition from pre-school to early primary education.

Yeboah (2002) suggests that there is adequate evidence that this earliest educational transition is difficult for some children. Despite some recognition of this, few of the authors whose work he reviewed found any formal administrative and professional links between early years administration and early primary school. Through a series of articles, Dunlop's research proposes several areas for development of continuity and progression that are particularly relevant in the present climate of curriculum change: she highlights that learners are perceived quite differently by early childhood educators, parents and early primary teachers (2002b), and shows the importance of teacher collaboration (2003a), playful learning (2003b), children's agency (2003c) and parental participation (2003d) in the transition to school and provides evidence from her longitudinal study to support change in practice. She asks the question of whether to promote continuity and progression in learning it is the system or the child who should change (2004a). By exploring children's learning trajectories, and considering factors such as learning environment (2004a), classroom discourse and curriculum documentation, she finds gaps are evident between contexts; in relationships and in content and presentation of curriculum before and after school entry. She advocates a move away from 'transition models' of schooling (2004c).

In Yeboah's view, it is essential that early years settings either side of the transition to school complement each other, that children are gradually introduced to new school processes, that primary school management practice takes account of children's needs at transition, that transition programmes are useful as well as information sharing on progress, and that primary schools consolidate the gains children make in early childhood education. Additionally he makes the point that parental involvement enhances transitions, as does contact with siblings and friends, and consistency of teaching method.

The literature review undertaken for the van Leer Foundation towards the EFA Global mentoring process (Fabian and Dunlop, 2006) shows that, by paying attention to socio-emotional wellbeing during the transition process to school, learning is also likely to progress. Their review suggests that in order to achieve this, policy planners need to embrace all participants – teachers, parents and children – in the context of their own particular community. When families play a part in their child's transition to school, the potential for continued family involvement in the life of the school is created. The following practical suggestions are made in this paper:

- Schools having a named person, or a small team, to take responsibility and a strategic overview of the process;

- Schools providing pre-entry visits for children and their parents that involve parents and children learning about learning at school as well as familiarisation with the environment and people;
- Schools having systems that allow for high quality communication and close interaction between family, pre-transfer settings and school, where information is both given and received about children's experiences;
- Schools being sensitive to the needs of individuals and particular groups and having strategies in place to support them;
- Flexible admission procedures that give children and their parents the opportunity to have a positive start to their first day;
- Children starting school with a friend and schools having systems in place to help children make friends;
- Schools having strategies to help children develop resilience to cope with change and to be active in making the transition work for them;
- Curriculum continuity across phases of education, that comes about from establishing the prior learning that has taken place and where children are helped to learn with and from each other; 'looping' where pre-school and school staff plan together and work alternate years in each phase;
- Schools evaluating induction and the management of transitions and transfers from the perspective of all participants, and that help to question the assumptions of the setting and see life from the child's perspective;
- Special training for staff working with those children who are starting school.

'Outcomes of Good Practice in Transition Processes
for Children Entering Primary School' (p15)

The authors assert that their suggestions are important whether countries have tightly connected links between preschool experience and primary education or, by contrast, where preschool provision is only loosely coupled or quite separated from primary education. They find that in much of the early childhood transitions literature authors polarise into those who advocate that it is important to narrow the gap between early childhood settings and primary school, and those who argue for bridging the gap. These different positions lead to a view on the one hand that smoothing transitions to school and preparing children for change is effective and, on the other hand, arguing the importance of transition as a means of maintaining distinctive and appropriate education for younger children.

There are several recognisable international groupings of writers on transitions – researchers and writers in USA have tended to focus on the 'school-ready child': a concept which grew out of national federally funded programmes such as 'No Child Left Behind' (NCLB, 2002) which brought a renewed focus to links between early childhood education and later school success, and to ideas of the child's readiness and adjustment to school.

Pianta *et al* 's (2002) study represents a shift away from most US research on transitions, which has focused on child characteristics and readiness, as they relate to later school adjustment. This study makes a shift to considering 'the child-ready school' and was designed to examine the relation of quality as observed in classroom and teacher practices, with teacher, school, classroom and family characteristics and also with teacher-reported and observed child outcomes in kindergarten, focus on the quality of kindergarten classroom environments as predictors of school success. 233 children in largely sub-urban or rural kindergartens in 3 states, their teachers and their families formed the sample for this study. The children were a sub-set of the larger sample of children involved in the NICHD Study of Early Child Care in 1996 (109 boys, 122 girls) and were on average a non-poverty sample. Global ratings of teachers' positive interactions with target children, classroom instructional climate and classroom child-centred climate were lower when the concentration of poverty in the school was high, when the target child's income was low and when the adult: child ratio was low. Children's observed and on-task behaviour and teachers' reports of social and academic competence were higher when these global ratings indicated higher quality (even controlling for family background factors). The complexity of the concept of classroom quality is acknowledged, as is the research which emphasises that achievement is a direct function of exposure to instruction in US kindergarten classes. A wide range of approaches was acknowledged, from 100% teacher-directed to no teacher directed instruction during the time of observation (3 hours). The variability of child experience as a function of the class they attend, and the effect of "confirming feedback" as an important component of child involvement in learning suggests that educational policies on class size and composition, issues of equity in early school experiences and the role of the classroom environment, are all important elements for enhancing transition.

Kraft-Sayre and Pianta (2000), report from the *Kindergarten Transition National Survey* (NCEDL, 1996) which drew on a sample of 3,600 kindergarten teachers surveyed on transition practices into kindergarten. In the overall study teachers report that although 52% of children make a successful kindergarten entry, 48% experience problems in making a successful transition. The study revealed important information about facilitating the transitions to early stages of schooling, finding a poor fit between the skills of children and

the expectations of their teachers. Findings include that schools should consider development and implementation of transition practices designed to facilitate successful transition, that communication between teachers and parents is central to effective transitions, and that children in urban-disadvantaged areas experience the most challenges with successful transitions. They provide an overview of the necessary planning process for easing the transition from kindergarten to primary school, making the point that 'one size does not fit all'. Kraft-Sayre and Pianta include a menu of transition practices. Developing an approach to the transition that caters for the needs of all children calls for the establishment of a transition plan and a coordinating body to manage the process. They have developed the following steps to a successful transition plan.

1. Forming a collaborative team of preschool teachers, first grade teachers, parents and other community representatives.
2. Identifying a Transition Coordinator (ideally a school professional who can serve as a bridge between the family, pre-school and primary school)
3. Creating a timeline (recognizing that the transition is a process experienced by all participants, rather than an event that happens only to the child, and that this process starts well before the school start!)
4. Implementing Transition Practices involving activities to enhance:
    - Family-School Connections (examples of activities include assessment of family needs, regular family meetings and events)
    - Child-School Connections (activities include preschool connection with school teacher, preschool practice of kindergarten rituals)
    - Peer Connections (activities include efforts to strengthen networks inside and outside of school, preschoolers connecting with school peers)
    - Community Connections (activities include coordinating services with social service and health care)
5. Evaluating progress and adjusting as necessary

The report of the 'School Transition and School Readiness' project (Kaufman, 2000) draws together research on different stakeholders' definition of readiness, characteristics of child readiness, and readiness as an outcome of early childhood development. Some key research questions emerge including how readiness is defined by teachers and parents, whether there are cognitive, social, self-regulatory and chronological markers of school readiness, and in which early education and home environments might children acquire 'school readiness'. We find school readiness to be an alien concept, rather the concept of a

continuum of educational experience and learning seems best fitted to the current climate of universal preschool education. A softer definition of school readiness is considered as including physical health, capacity to communicate, curiosity and enthusiasm for learning. Research on readiness as defined by cognitive, social, self-regulatory and chronological markers show a link between children's social adjustment to kindergarten, their performance and involvement and the degree to which they show compliance with instructions.

The report also presents research demonstrating that children's child-care environment contribute directly to their transition and adjustment to school. Quality preschool or child-care predicts ease of kindergarten adjustment, enhances pre-academic skills and strengthen social skills. Interestingly there is also research that supports a moderate approach to "out-of-home" care as children who spend a lot of time in non-maternal child care environments show greater conflict and tendency to externalize problems in kindergarten. The nature and quality of the parent-child relationship also influence children's competencies as they enter school. Parents' behaviours toward their children and the stimulation they provide have substantial effects on children's adjustment to the first months and years of school.

Kreider (2002) proposes that family involvement in young children's education may contribute not only to a smooth transition to elementary school for children, but may also empower parents by helping them to prepare for later involvement in their children's learning in elementary school.

A number of important processes were seen to promote parental involvement in their children's learning:

- Information and guidance – give parents knowledge in how to help their child.
- Leadership opportunities: give parents a sense of efficacy about getting involved.
- Patterns of practice – established early give parents skills for later involvement.
- Trusting relationships – help parents connect with other educators later on.

Baker and Little (2002) conclude that family involvement should be an integral part of transition policies and programs. Teachers may play a crucial role in shaping parent's attitude and consequently involvement as families are a critical partner in providing continuity as children move between systems of care and education

The work of UNESCO and the Bernard van Leer Foundation has generated a number of studies in countries where preschool education is less secure and the challenges for children

and families may be very different from those found in Europe, USA, Australia or New Zealand. Often these studies focus on the differences between the home culture and the school culture (le Roux, 2002). Some key findings from these studies are drawn out for their potential relevance to curriculum architecture in Scotland.

Clarke and Sharpe (2002) report two studies into intervention with parents and children before school, and an enquiry into children's adjustment to school in Singapore. Both studies focused on the last 6 months of pre-school and first year of primary school. Study 1 had a sample of 211 parents and children attending 6 different child care centres over the 2 years of the project. Study 2 had a sample of 412 families using 15 kindergartens. 56 children from this sample were interviewed in their last 2 months in kindergarten and again in P1. Smaller samples of parents and children were used in the middle of the year in P1. Structured interviews and questionnaires were used in the first study, with primarily open-ended questions. English and Chinese were used for each aspect of the study. Both studies used focus groups. The second study used surveys and interviews primarily using rating scales. For most parents this was the first child in school and even though some information had been given, many were anxious about what to expect. This stress in relation to children's schooling continued into the first year at school, though children were deemed to have settled well on the whole. The aspects of school children liked included recess and the garden, but most were fearful of teachers and recognised an increase in work. Clarke and Sharpe found there is room for change of practice and more cooperation between kindergarten and school and home and school. The parents' themes and issues raised concerns leading the authors to think that kindergarten and primary school teachers might want to reflect on teacher-pupil contacts and an individualised approach to teaching and learning. Kindergarten teachers might also think about the demands of the primary school curriculum as they look ahead to the child's transition.

In the Nordic countries, New Zealand and the UK, whilst governments may have adopted 'school readiness approaches, the increasingly dominant focus amongst transition researchers in the field of early childhood has generated an alternative literature that assumes that school induction and transition programmes afford children opportunities to familiarise themselves with school in positive ways: these writings emphasise the importance of 'child-ready' schools.

Some of the original studies into transition and continuity and progression were undertaken in Scotland (Watt and Flett, 1984) and England (Blatchford, P., Battle,S. and Mays, J.,1982; Cleave, S., Jowett, S. and Bate, M., 1982). In their study, Watt and Flett placed an emphasis

on the relationship between the important adults in a child's life; Blatchford *et al* considered transition to be more than entry to a new setting, including both a prior and an ongoing process. Cleave *et al*'s main focus was continuity and progression in the educational experience of children between the ages of 3 and 8 years. Starting school "is a necessary transition for most children" (p4), and the project agreed that it was therefore the best time to consider continuity. Taken together, their work heralds issues that are still pertinent twenty years on.

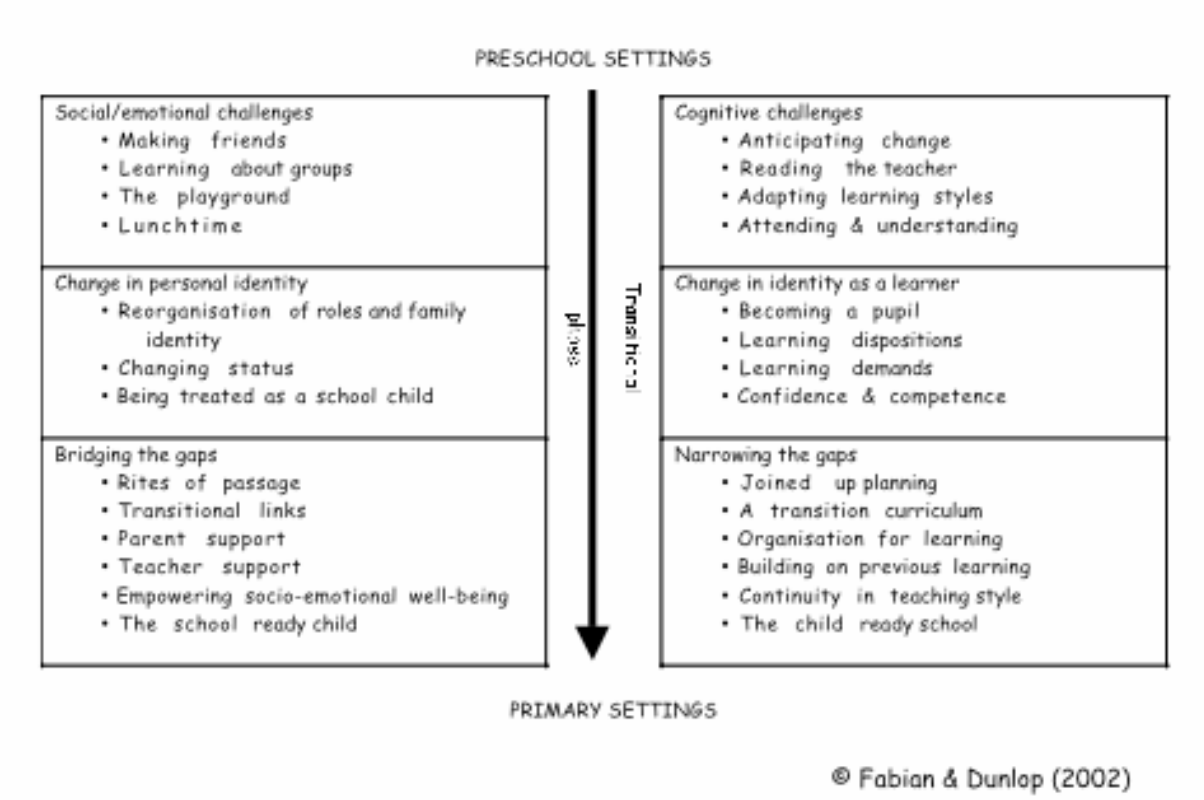
Fabian (2002) builds on a doctoral study "Induction to School and Transitions Through Key Stage One: Practice and Perceptions", with 50 children and their parents, teachers, and induction co-ordinators in two schools, to make recommendations about transitions and transfers: she includes the need for a co-ordinator; transition activities and strategies in response to individual need; reflection on the place of child resilience; issues of continuity, and the importance of school evaluation of induction from all stakeholders' perspectives. Recently, Fabian (2006) has reported on the way in which the new Welsh early years curriculum 3-7 may push the main early educational transition on for children to the moment when they leave Key Stage 1. It can be argued that children will be more able to handle transitions at that stage.

Brooker (2002) reports an intimate and very detailed study of 16 children that focuses on the ways in which parents, children and teachers strive to cross cultural and linguistic boundaries to come to a common understanding of what school is. This ethnographic investigation of the learning experiences offered in a Reception class in England, and in the children's homes, and experienced by 16 children over a school year, makes a strong focus on the experience of inequality. Further, it looks at how the home experiences of children from poor and ethnic minority communities influence children's adaptation to school and raises questions about the cultural relevance of traditional approaches to teaching in early childhood classrooms. A mixed methodology of data collection, including: informal observations using field notes; entry assessments; parent interviews; daily diaries of children's experience; parent questionnaires; systematic observation; child interviews; document analysis; analysis of children's products and ongoing records; staff interviews; end-of-year assessments; debriefings with parents was used. In a chapter entitled 'Understanding Outcomes; Changing practice', the author addresses a range of issues: the winners and losers; structural effects in terms of class and capital, race and ethnicity, interactions with gender and family structure; cultures and pedagogies in terms of parental experiences and ethno theories, home language and literacy, school culture, boundary effects; changing practice and the role of practitioners. The wider understanding of learning

cultures needed by new-entrant teachers is emphasised: in schools catering for children with atypical background experience, where there is a wide gap between home and school experience, curriculum architecture must be able to take account of the diversity and differences represented in any school intake.

In this section we have proposed a link between home, early childhood preschool settings and primary school. Each of these learning environments has different characteristics. If the challenge of each of these learning environments is to foster young children's development and learning to their full potential, it is essential to ask: How can these environments be linked together in a better way so that movement between them is not so stressful? Myers presents a typology and elaborates on approaches to problems related to transitions. In so doing appropriate ways to socialize parents and children before entrance into primary school are sought, as are adjustments within school to smooth school entry and to strengthen children's, parents' and schools' 'transitions capital' Dunlop, 2006) and success in the first years of schooling.

Dunlop and Fabian (2002) propose that this means taking account of the changes that occur for children in transition in the ways shown below-



Key factors which emerge from the literature on early years transitions include the following:

- Transitions are complex
- Learning should be better supported across the transition to school
- Social-emotional well-being should be supported across the transition to school
- Initial success at school both socially and intellectually, leads to a virtuous cycle of achievement
- Playful learning and common pedagogy supports the transition to school
- Parental participation in early childhood transitions is beneficial
- Going to school with a friend is helpful for young children
- Diversity should be recognised and provided for at school entry
- The role of a transitions coordinator could be usefully explored
- Children, families, educators and schools should aim to build 'transitions capital'

5.2 Primary to secondary

Boyd and Simpson (2000), in their study of one local authority in Scotland, found that while the huge effort put in by primary and secondary school staff to smooth the transition of pupils from P7 to S1 was valued by pupils and parents alike, it did little to promote progression and continuity in learning. Indeed, aspects of curriculum architecture were singled out by the authors as inhibiting the continuity of the learning process. Secondary timetabling was dominated by the demands of the external examination structure to the extent that S1 was the least year to be timetabled. Contrary to advice from HMIE, it was still common for S1 pupils to encounter 15 or 16 subjects (and therefore 15 or 16 different teachers) in one week. The net effect of this fragmentation was that certain key aspects of the curriculum appeared not to be the responsibility of any single person or department and could fall through the net, so to speak. Boyd and Simpson found that reading and continuous writing both suffered from this lack of coordination. In the former case, one school had found a solution which, while successful, fell foul of pressures placed on the timetable by the national examinations. It had taken time from Registration (which happens first thing in the morning each day) and from 'core' English and had recruited senior pupils who, in their study time, had given S1 pupils who were behind with their reading one-to-one tutorial support on a daily basis. It was so successful in raising 'reading ages' that the staff involved asked senior management to extend the scheme to the new S1 intake while continuing it into S2 for those already involved. However, the English department objected to losing more time from

teaching and the head of senior school felt that senior pupils were giving too much time to it, and the scheme continued in its original form.

Setting and broad-banding of pupils within subjects, in some cases as early as the beginning of S1, was prevalent in most of the secondary schools, but there was little rationale and virtually no cognisance taken of any research evidence when making such decisions. The case of Cognitive Acceleration through Science Education (CASE) illustrated the dilemma facing secondary teachers in a crowded curriculum; the evidence was that CASE raised pupil attainment, but the fact that it required some 30 periods over S1 and S2 meant that some teachers and departments did not use the approach.

The difficulty faced by primary and secondary staff in trying to find a mechanism for the transfer of information in a way which facilitated progression and continuity in pupil learning was illustrated by the Depute Headteacher's exhortation to Principal Teachers on the first day of term to pick up the P7 "Best Work" folders and discuss them at their departmental meeting. In the event, only 3 departments took up the offer. The others did not see the immediate relevance of spending time reading the folders which the P7 pupils and teachers had put together.

The conclusion of the Boyd and Simpson study is that a framework for effective learning and teaching, an example of which emerged from their observation of teachers, might provide a starting point for CPD between primary and secondary teachers so that continuity and progression could be 'owned' by the staff in the cluster and the work done in primary school would be built upon in the secondary in ways which did not label pupils.

In her (unpublished) PhD thesis, Hughes (2005) looked at a cluster of primary and associated secondary schools and focused on progression in pupils' writing. She found that the concept of 'progression' itself was not well understood by teachers. She also argued that continuity and progression were not linked in the way which had previously been accepted, namely that discontinuity was a *cause* of lack of progression. In her small sample, she found that the rate of progression of individual pupils was independent of the amount of discontinuity (e.g. of teacher) experienced. Thus, she argues that some level of discontinuity might actually be desirable in the move to secondary school (in general as well as in approaches to writing) but that a clearer understanding of the concept of progression in writing would help ensure that pupils continue to develop their skills.

Galton *et al* (2003) included some 350 schools at different points in their research on transitions and transfer in the middle years of schooling (7-14). They were concerned with factors that might impede pupils' progress both at times of transfer between schools and transitions within schools. In their concluding chapter, "re-thinking the middle years of schooling" they argue, like Boyd and Simpson, that transfer arrangements among schools are generally very good. However, they highlight similar concerns about a lack of focus on progression in pupils' learning (p103). They refer to the 'dip' in progress and attitude in Y7 (S1). Having analysed pupil progress in English and maths using NFER data, Dalton and his colleagues and reported that it was very variable and argued that schools should be 'rewarded' for all levels of pupil progress, not just those identified externally as being significant (e.g. 5-14 levels). They suggest, too, that because some levels are regarded as more significant than others, primary schools often waited until P7 to make a 'push' on pupil progress, whereas an earlier intervention, sustained over time, would be more likely to succeed. Finally, schools should be encouraged to employ a greater range of interventions, not simply those geared to the demands of the test.

They point to the narrowing of the curriculum in P7 as a consequence of the tests and suggest that this 'squeeze' on pedagogy should be resisted. Like Hughes (*op cit*), they suggest that some element of discontinuity between primary and secondary might not lead to lack of progress and that teachers, in collaborative CPD situations, should look in more sophisticated ways at continuity and progression. They are sceptical of 'bridging units' as a vehicle for genuine progression of pupil learning and are more hopeful of some of the case study 'post-induction' S1 programmes on learning offered by some secondary schools with primary input.

Thus they recommend that schools emphasise learning as well as social issues in transfer arrangements; that test and assessment data is balanced with professional input; that coherence across subjects is an important contributor to pupils' progression; and that advisers can have a 'critical friend' role with clusters of schools to promote progression.

Graham and Hill (2003) looked at children transferring to secondary school in the Glasgow area, with a particular focus on pupils from minority ethnic backgrounds. They found transfer programmes to be successful in general for most pupils but suggested that more post-transfer work should be done in terms of values, culture, religion and language if young people from minority ethnic backgrounds were to fulfil their potential.

Hargreaves and Galton (2001) looked at “transfer from the primary classroom, 20 years on”. They studied 6 post-transfer schools and their ‘feeder’ schools. They concluded that continuity and progression were hampered by the lack of knowledge among teachers of the other sector and therefore ways had to be found of enabling teachers to work across the sectors. Secondary teachers consistently underestimated pupils’ abilities and more joint CPD was needed to explore this issue. Pupils spent less time in secondary classrooms working in groups than they did in primary and Hargreaves and Galton suggest that discussion on pedagogy needs to take place between primary and secondary teachers.

Rudduck *et al* (2003) focused on the importance of friendships at the transition phases between primary and secondary and argued that pupils should have more say in the creation pupil groupings so that peer support systems could support pupils’ learning. They argued that anti-work attitudes observed in pupils might be addressed by building on friendship systems. Ruddock points to Year 8 (S2) as a ‘pivotal’ year in maintaining the motivation of young people and suggests that schools ensure that pupils are fully involved in decision-making about learning pathways.

The General Teaching Council for England in 2002 published a document entitled “Transfer from the primary classroom – 20 years on”. In general they found that some things had improved and some initiatives had helped. Transfer was in general well supported and the report presents a number of excellent case studies. However, as with the Boyd and Simpson study (*op cit*), curricular continuity was still a challenge and issues of pedagogy remained to be addressed.

Bryan, Treanor and Hill (2007) in a SEED-funded study, “Evaluation of Pilots to Improve Primary to Secondary School Transitions” found that all three pilots, in different local authorities, were reported to have had a positive impact on the schools involved. Importantly, teachers in both sectors in two of the Councils reported that they had learned new teaching techniques as a result of working together. Primary teachers in both of these pilots reported that working with secondary teachers had increased their pupils' motivation. P7 pupils enjoyed working with the secondary staff and said they had learned new skills in Reading and Writing or Maths. Data analysis showed that in one Council, P7 Reading attainment improved overall during the pilot, although no consistent pattern of change occurred in Writing attainment. Although teachers in another council were able to give examples of specific groups of pupils making 'huge jumps' in Maths attainment, there was no evidence of a measurable overall improvement in Maths attainment among P7 pupils at the primary

schools involved. Teachers in both pilot areas suggested that the real impact on pupil attainment was more likely to be seen when P7 pupils made the transition to S1.

At the secondary schools in one Council, teachers emphasised the positive effects the LDOs had on their English departments, particularly in terms of offering support and training to colleagues, helping to monitor and administer National Assessments, and introducing new teaching and learning methods to English classes in S1 and S2. These changes in how the curriculum was delivered affected outcomes for pupils.

Teachers reported an increase in attainment after the introduction of a literacy pilot, and the quantitative evidence broadly supports these comments. In particular, analysis of data for each pupil cohort showed that one cohort improved their Writing attainment compared to the Council as a whole over the two years of the pilot, and Reading attainment improved in both cohorts compared to the authority average during the same two years. Involvement in voluntary activities also encouraged pupils to read more often, and more widely, than they had before.

In another of the Councils, teaching methods in S1 and S2 were influenced by the cross-sector work with primary colleagues, including a focus on more interactive methods and Maths games. These changes, and an increased focus on the use of technology such as Promethean Boards, led to a reported increase in pupil motivation. The numeracy pilot also led to improved pupil/teacher ratios at both secondary schools, with smaller class sizes particularly benefiting the least able pupils.

Teachers believed the numeracy pilot had improved pupil attainment, but also stressed that the impact on attainment was likely to be seen in the academic year 2006/07, when the new Programme of Study had been fully implemented and the new S1 intake would have been working on the programme in P7. Quantitative analysis showed that Maths attainment had declined in one school, and improved in S1 (but not in S2) in the other. This was partly attributed to the particular cohort of pupils involved, and the decision to delay testing while the new Programme of Study was implemented. Cohort analysis showed that while one pupil cohort's performance improved compared to the Council average over the course of the pilot, the other cohort's Maths attainment declined in relation to the education authority as a whole.

Cross-sector work in the literacy and numeracy pilots was reported to have a positive impact on pupils' experiences of transition from primary to secondary school, both socially and academically. In two of the Councils, pupils felt reassured knowing a teacher at secondary

school, and their positive experiences with secondary teachers during P7 had dispelled any fears they had had about the standard and quantity of work in S1.

Importantly, the cross-sector transfer of information about pupils improved as a result of the literacy and numeracy pilots. In one Council, the LDOs' primary liaison provided information to secondary staff about individual pupils and the P7 curriculum in general. In East Ayrshire, improved cross-sector liaison, and particularly the introduction of the new Programme of Study, led to better transfer of information about pupils, allowing more accurate setting in Maths from the start of S1. This was viewed positively by both pupils and teachers.

The ENABLE project was reported to be very beneficial for pupils at one Secondary school, particularly because of the fact that it provided a secure environment for the child. Smaller class sizes, and the level of social and academic support available, had a favourable effect on pupils' experiences of the transition to S1. Pupils were positive about their experiences of ENABLE, liked their teachers and felt able to go to them for help with any aspect of school life. In terms of attainment, many of these pupils had mastered basic literacy and numeracy skills by the end of S2. Furthermore, analysis of Standard Grade performance in 2005/06 showed that the pupils had done better than a comparable group who sat exams in 2004. Importantly, this project succeeded in keeping pupils engaged in mainstream education, with the drop-out rate by S4 improving markedly for these pupils compared to comparable pupils in previous year groups. Teachers also observed an increase in the the pupils' confidence and personal development. Pupils in mainstream S1 and S2 classes also benefited from the introduction of ENABLE and the resulting reduction in class sizes.

The report's "Conclusions and recommendations" section is extensive and suggests that not only were the pilots successful in their own terms and none was obviously 'better' than the others. They were essentially appropriate responses to local needs. It therefore appeared it was not so much the precise model that affected the smooth running and success of the projects, but other factors and processes. These included issues relating to staffing, the importance of cross-sector liaison and interchange, effective communication, and the ability of the pilots to be flexible and responsive.

5.3 Secondary and beyond

In 2000, Canada produced a thematic report (OECD, 2000) on the transfer from school to the world of work. Using a mix of questionnaire and case study approaches across all of the provinces, the report concludes that there are resources in the system for school-work programmes but they are patchy across the country. Not all of the stakeholders accorded

equal status to these programmes and they were often targeted at the less academic students. They argue for a diverse approach to take account of local circumstances and suggest that a stronger knowledge base is needed on successful programmes. They recommend that while such programmes need to be developed, more work needs to be done on 'risk factors' in students' early childhood which impact negatively on their staying on rates and successful transition from school to work.

In a policy document entitled Lifelong Learning: Force for New Century, the Icelandic Ministry of Education, Science and Culture (1998) argued that good general education is a pre-requisite for lifelong learning. "Flexibility in studies and in teaching methods" was singled out as being the most important issue in combating the drop-out rate from secondary schooling and in laying the foundation for lifelong learning. Short, job-related courses were advocated as well as collaboration with the business community.

Asher (2005), using a case study approach, looks at the issue from an Education Business Partnership perspective. In England in 2004, work-based learning at Key Stage 4 became a statutory entitlement. A case study of Parklands High School is used to illustrate:

- greater employer involvement
- more students opting for competence-based learning in colleges or with local business providers
- the way all pupils can have this as an option (not only the "less able")
- pupils working towards recognised industry qualifications
- a fifty per cent increase in the number of pupils gaining 5 GSCEs (A to C)

Issues remain to be addressed, including increasing schools and employer engagement, more flexible school timetabling and better monitoring and evaluation. However, there is evidence that good practice is taking place and should be considered when schools embark on such programmes.

Vlaardingerbroek (2005) describes how New Zealand changed its form of national certification to give a prominent position to vocational education. Their National Qualifications Framework means that students can simultaneously gain credit towards the National Certificate of Educational Achievement and towards a vocational National Certificate. This, she claims, has promoted an unprecedented level of cooperation between schools and further education colleges. The interface has become blurred and a new era

has dawned for some pupils who were not well served in the previous system. In passing, she believes, it may begin to make inroads into the problem of boys' underachievement. Schools can now register as industrial training institutions for the purpose of delivering and assessing courses. FE colleges help in the accreditation process and the liaison between the two sectors has become positive and productive.

In Ireland, the concept of the "transition year" was introduced in 1974. Taken in the equivalent of the Scottish S4, it emphasises social skills, independent learning and experience of adult and working life. In "The Transition Year Programme: An Assessment Smyth, Byrne and Hannan (2005) report that the number of students taking part in the Transition Year programme has grown significantly since the mid-1990s. However, little is known about the nature of the programme and its impact on the students who take it. Their study provides a comprehensive examination of the operation of the Transition Year programme using information gathered from school principals, teachers and students themselves.

They found that experience of Transition Year varies from school to school. Schools differ in the kinds of subjects students can study, the nature of their work experience placement, the kind of assessment used (for example, project-work or formal exams) and the extent to which all (or most) teachers in the school are involved in the programme.

School principals and teachers see the Transition Year programme as broadly successful, especially in developing personal and social skills among students. However, principals in designated disadvantaged schools, smaller schools and those in the vocational sector are somewhat less likely to see the programme as effective. Many students feel that Transition Year exposes them to different experiences, providing a 'break' after studying for the Junior Certificate and making them more mature. However, other students consider the year to be a 'doss' and 'boring'. Students who are not very positive about school life in general tend to have more negative views about Transition Year, especially if they attend schools where the programme is compulsory.

Taking Transition Year has an impact on students' academic outcomes, even taking account of initial differences between participants and non-participants. On average, students who take part in Transition Year achieve higher Leaving Certificate exam grades and are more likely to go on to higher education than non-participants. However, not all students do better academically as a result of taking Transition Year. This is the case for two groups of students: male students who work part-time and continue to work up to their Leaving

Certificate year; and students in more disadvantaged schools where the programme is compulsory.

A successful Transition Year programme has a number of features: a whole-school commitment to the programme; time for co-ordination activities and for co-operation among teachers; varied programme content, covering a range of different subject areas; a structured exposure to the world of work; the use of more innovative teaching methods and forms of assessment and accreditation; and on-going evaluation and redesign of the programme within the school. The main constraints to the successful operation of Transition Year are lack of time and insufficient financial resources (for funding activities and outings).

5.4 Conclusions

The evidence from the research on transitions and transfers suggests that they are complex and that considerable time and effort has to go into ensuring that learning is better supported across the transition. In early years, it is particularly important that social-emotional well-being should be supported across the transition to school. Initial success at school both socially and intellectually, leads to a virtuous cycle of achievement and so playful learning and common pedagogy should support the transition to school. Parental participation in early childhood transitions is beneficial as is going to school with a friend. Diversity should be recognised and provided for at school entry. In management terms, the role of a transitions coordinator could be usefully explored. All of this is necessary if children, families, educators and schools are to build 'transitions capital'.

Primary-secondary transition has been the subject of research and policy initiatives in many countries for some decades. Recent research in Scotland suggests that continuity and progression in learning has proved difficult to achieve. Lack of time for dialogue among teachers across the sectors is one issue as is the lack of shared understandings about pedagogy. A framework within which to discuss issues of learning and teaching, not least contentious practices such as setting in early secondary using assessment data from the primary school, might be useful. It has also been established, at least in the area of children's writing that the definition of 'progress' is often problematic and that the link between progression and continuity is complex and can vary from pupil to pupil. Studies in England have identified a 'dip' in pupil attainment in Year 7 and 8 (S1 and S2) and the pressure exerted by SATS is cited as a possible cause. The conclusions of these studies support those in Scotland, namely that better teacher-teacher dialogue is needed.

From a pupil perspective, there is some evidence of transitions being more problematic for children from minority ethnic backgrounds while for all children it has been suggested that greater active involvement in the actual preparations for the transition might be of benefit.

A 2007 SEED-funded study of three pilot transition projects has concluded that it was not so much the precise model that affected the smooth running and success of the projects, but other factors and processes. These included issues relating to staffing, the importance of cross-sector liaison and interchange, effective communication, and the ability of the pilots to be flexible and responsive.

The final transition from school to work has been the subject of research across the world, most notably in the antipodes and in Ireland. The status of projects designed to smooth the transition to the world of work can often be perceived as being low by the stakeholders and job-related courses, while successful, struggle to be take seriously by parents, Higher Education and even pupils themselves. The' transition' year implemented in Irish schools has attracted some positive publicity (TESS, February 16, 2007) and has been adopted by most secondary schools. Evidence suggests that transition years are most successful when they aim to create a whole-school commitment to the programme; time for co-ordination activities and for co-operation among teachers; varied programme content, covering a range of different subject areas; a structured exposure to the world of work; the use of more innovative teaching methods and forms of assessment and accreditation.

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Appendix Curriculum Architecture - Literature Search Strategy

Literature searches for the Curriculum Architecture Literature Review have been carried out according to a set of parameters as follows:

Parameters of Literature Search

Studies considered for review meet either **one or both** of the following key criteria:

- The documentation reports curriculum architecture
- The article reports evidence on curriculum architecture, to processes which have been shown to impact on pupil motivation, attainment and achievement.

In addition, articles included meet all of the following criteria:

- The article clearly describes methods of data collection and analysis used in the study (i.e. it reports an empirical study)
- The study provides sufficient information to make some judgement about the reliability and validity of its findings
- The study was published in the last 5-6 years unless it is deemed to be of high relevance (if earlier than 2000)

Particularly for key sources pre-dating the publication year parameters, curricular and stage experts have drawn from their knowledge of their field to identify relevant documents to be included for incorporation into the report.

Initially and in line with the parameters of this search methodology, all searches were limited to publications from 2000 onwards; after submission of the draft interim report it was decided to extend the search to include relevant documentation from publication year 1995 onwards, particularly for search areas with a relatively limited number of articles. Interesting and relevant work of a more discursive, non-empirical nature was not automatically excluded but used for contextualisation of literature empirical research findings and utilised for

introductory and concluding discussions. Where appropriate, abstracts were obtained for initial checking of relevance.

Main Overarching Themes of Literature Search

- School structures and school systems; including transitions (from pre-5 to primary, from primary to secondary, from secondary to working life) & starting age of formal schooling
- School size & school building
- School timetables and organisation of the curriculum; including extended and community schools
- Class size
- Class organisation: streaming, setting, mixed ability, within-class groupings
- Pedagogy & teaching methods
- School ethos
- Inclusion, equality and differentiation
- Personalisation of the curriculum; including subject choice & ICT and digital technologies
- Integrated, inter-disciplinary and cross-curricular approaches vs. subject-based teaching, including vocational vs. academic focus
- Assessment/examinations and testing regimes
- Teacher assumptions and pupil aspirations
- Differential impact of curriculum structures on subgroups of learners (e.g. gender, minority ethnic background, SES, SEN/ASN)

- Teacher responses to changes in curriculum architecture & Continuing Professional Development (CPD)

Databases & Websites Used for Literature Search

Databases used include:

- ABI/Inform Global
- Australian Education Index
- British Education Index
- Education Resources Information Center (ERIC)
- Education-line
- IngentaConnect
- WilsonWeb / OmniFile
- Various international government and educational authorities websites (including www.firstgov.gov, www.australia.gov.au, www.skolverket.se)

The lists of articles from the different databases were cross checked for duplication.
In addition to database searches, more general web-based searches were performed.
Websites referred to include:

- Department for Education and Skills (DfES; www.dfes.gov.uk)
- Eurydice (www.eurydice.org)
- HM Inspectorate of Education (HMIE; www.hmie.gov.uk)
- Learning Teaching Scotland (LTS; www.ltscotland.org.uk)
- National Foundation for Educational Research (NFER; www.nfer.ac.uk)
- Notschool.net (www.notschool.net)
- Office for Standards in Education (Ofsted; www.ofsted.gov.uk)
- Organisation for Economic Co-operation and Development (OECD; www.oecd.org)
- Scottish Executive (www.scotland.gov.uk)
- TeacherNet (www.teachernet.gov.uk)
- The Times Educational Supplement (TES; www.tes.co.uk)

Virtual Research Environment (VRE)

Throughout the project, all literature has been stored in our Virtual Research Environment (VRE): a shared repository of relevant documentation. The VRE has been used as the work site for the project, providing shared file space and discussion area for the project team.

The number of documents stored in the VRE is as follows:

Section	Abstracts	Curriculum Documents	Full-Text Articles	URLs
Early Years & Primary School	63	12	73	8
Secondary School	77	1	87	16
Impact of Curriculum Change - Generic Issues	26	-	57	8
Transition	7	-	14	3