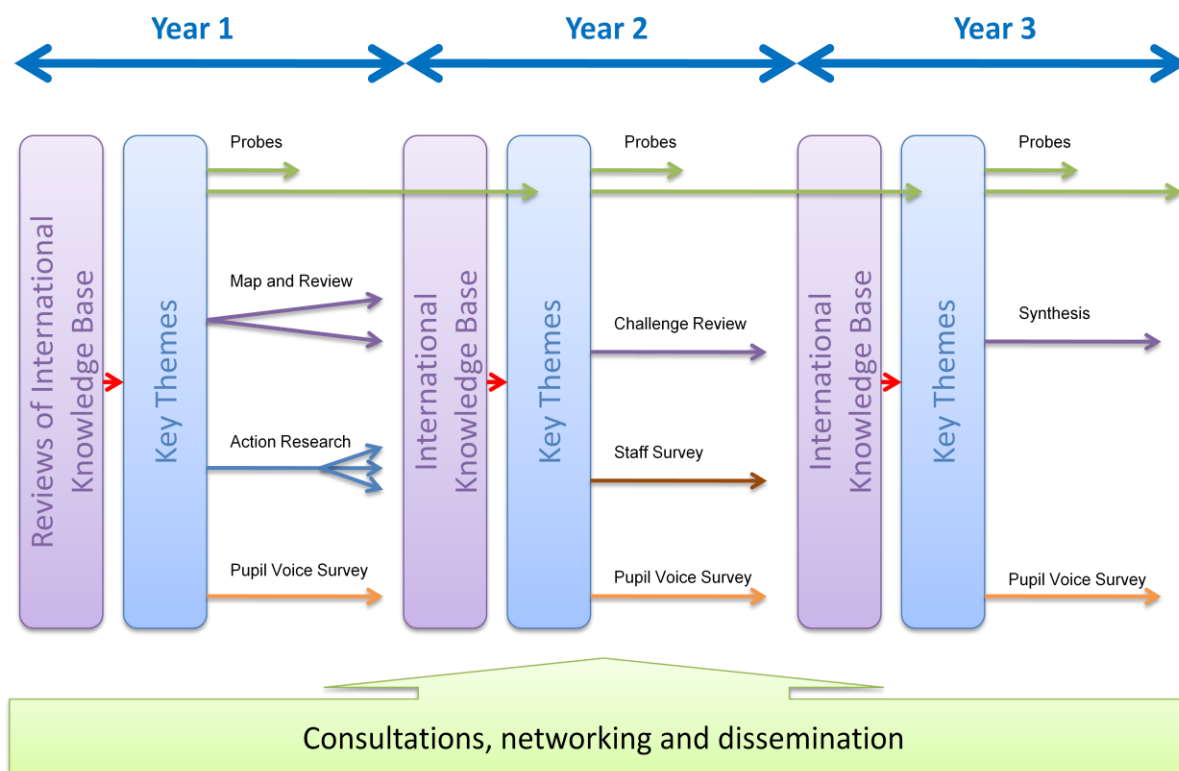# Building the evidence base for a curriculum for the 21st century

Findings from a three year study commissioned as part of the Qualification and Curriculum Development Agency's (QCDA) responsibilities for monitoring the curriculum.

Executive summary

Introduction

1. The research for this project took place between Summer 2007 and Summer 2010. Although set in the context of wider ranging policy change, the focus of this research is the way that the curriculum was being implemented in and by schools rather than the process or outcome of specific policy interventions.

2. The plans for the research that was undertaken each year were rooted in the findings from systematic reviews of the international evidence base. For the first review which launched the project, the findings from sixty-four reviews, covering thousands of individual research studies were analysed and synthesized. From this initial mapping of the evidence base and follow up review (2008, 2009) six key areas of activity or themes were identified as being linked to possible outcomes for learners. These 'themes' were both refined and reinforced through further investigation over the three years of the project using a range of methodological approaches, including another large-scale systematic research review. The fieldwork elements of the project included qualitative, multi method, multi site, school-based research – or 'Probes.' One hundred teaching staff and 799 learners in 29 schools were involved in these probes. Large scale learner surveys involving in total 15,060 in 334 participating schools were undertaken over the three years of the project. Surveys were complemented by 20 follow up focus groups involving 252 learners. Focus groups were designed to reach students who might not participate in surveys and to explore, in more depth, and to explore issues that emerged as important or problematic in survey responses. The fieldwork as a whole was focused on exploring how key phenomena were being experienced by learners in classrooms and operationalised by teachers and their leaders. In addition, ongoing fieldwork was complemented in 2007-8 by practitioner action research, and in 2009 by a staff survey involving 570 teachers and middle and senior leaders.

3. In the third year the findings from each strand of activity were analysed against the key themes emerging from the international evidence and from fieldwork reports, to create the cross project synthesis on which this executive summary is based.

4. The graphic below provides a schematic overview of the flow of work for each year of this project. Full technical reports for each of the strands of activity illustrated via this diagram are available and the full report underpinning this Executive Summary provides detailed references for all the evidence highlighted in this summary.

Figure: A three-year project timeline diagram showing Year 1, Year 2, and Year 3. Each year begins with "Reviews of International Knowledge Base" / "International Knowledge Base" feeding into "Key Themes". Activities across the years include: Probes, Map and Review, Action Research, Pupil Voice Survey (Year 1); Probes, Challenge Review, Staff Survey, Pupil Voice Survey (Year 2); Probes, Synthesis, Pupil Voice Survey (Year 3). Underpinning all three years is "Consultations, networking and dissemination".

5. At the end of the project (2007- 2010) the original six key themes had expanded, through further research, to seven, all of which were powerfully linked by evidence to effective outcomes for young people. We have used these to structure this summary report of the key messages from the project as a whole. They appear in the order in which they emerged from the review and from the fieldwork, with the exception of the theme relating to CPD and management of curriculum change, which appears last because, as a key to infrastructure it is different in line from the others. Our evidence illustrates how learning and achievement flourish when teachers and schools:

- provide curriculum experiences that enable learners to experience ideas, facts and phenomena in context (context-based learning) and connect the curriculum with learning in the home;
- create curriculum experiences that build cumulatively on learners' existing knowledge, understanding and skills;
- structure group work in teaching and planning for effective talk as a means of ensuring all learners can access the curriculum;
- foster a less compartmentalised approach to the curriculum to promote conceptual development and to encourage cross curricular transfer of learning;
- engage learners actively in assessment;
- plan appropriate curriculum tasks, including planning for challenge; and
- provide professional development to support both excellence in subject knowledge and in the teaching and learning processes that translate such knowledge into curriculum experiences for young people, and integrate such development in the management of curriculum change.

Key messages from each theme

Theme 1. Providing context based curriculum experiences and linking learning at school and in the home

6. The international evidence clearly indicated the value of context-based learning. This approach successfully engaged learners with the curriculum and helped them to see its relevance to their lives beyond school whilst enhancing their subject knowledge. It also contributed to the development of learners' skills in reasoning and critical thinking.

7. The snapshot provided by the staff survey in 2008-9 indicates that context based learning was a consideration in curriculum planning for KS3 in about a third of secondary schools, but that it ceased to be a priority for all but 10% of schools during KS4. The latter trend may be related to the external examination curricula and to external evidence of teachers 'teaching to the test'. Schools making connections between the curriculum and learners' home and community life adopted three broad strategies:

    - parental engagement in learning set by the school, for example via interactive homework activities;
    - the school creating conditions for learners to draw on their experiences outside of school to support learning in lessons, for example via encouraging learners bringing in food packaging to explore air miles; and
    - community based tasks.

8. The evidence of the benefits of home-school links centres around engaging parents and carers more in their children's learning and is also linked to improvements in academic achievement.

9. *To summarise: the key message for school practice is that creating opportunities for learners to make connections between the school curriculum and the 'real world' promotes effective learning. Schools could do more to engage parents in their children's learning and to create curriculum experiences in which learners draw on outside experiences. It is also likely to be helpful to increase the use of curriculum experiences organized around community based tasks.*

Theme 2. Creating curriculum experiences that build on learners' existing knowledge, understandings and skills

10. The international evidence base highlights the importance of designing curriculum experiences that identify and build on learners' starting points. Our school-based research helps to illustrate the ways that successful schools do this. Yet there is also evidence (from the focus groups and from the 2009 review) that this is a challenging aspect of curriculum planning and enactment. The obstacles identified ranged from practicalities such as the demands of doing this well for significant numbers of learners, through teachers' difficulties in spotting the moments when it is important to move from central guidance to handing over increasing responsibility to learners. They also included concerns amongst teachers about the learners' lack of skills in articulating their own thinking and starting points.

11. This highlights the importance of encouraging the development of skills in articulating thinking and existing understanding from an early stage and a need for effective Continuing Professional Development (CPD) in appropriate pedagogies, and in the development of the excellent subject knowledge required to implement them. CPD was a consistent theme across all the evidence strands over the research period. In this case it could also be effective in helping teachers to learn how to develop strategies for overcoming some of the perceived obstacles to establishing their learners' starting points.

12. *To summarise: the key message for school practice is that planning curriculum experiences which help teachers identify and build on learners' starting points effectively promotes learning. It is also challenging for teachers. Appropriate CPD has a significant role to play in addressing this challenge.*

Theme 3. Structuring group work in teaching and planning for effective talk as a means of ensuring all learners can access the curriculum

13. There is extensive international evidence about the benefits of structured group work. Evidence from England between 2007 and 2010 shows how teachers in schools that are effective curriculum innovators all value and make use of carefully planned and structured group work and collaboration as a way of:

   - securing access to the curriculum;
   - promoting young people's in-depth engagement with many (though not necessarily all) subjects, and the curriculum as a whole;
   - enhancing reasoning and problem solving skills; and
   - increasing attainment and achievement.

14. There is also evidence from those schools that are successfully harnessing and deploying these benefits, that structured group work helped them to:

   - enhance emotional development;
   - improve confidence and self esteem;
   - support increasingly independent learning through good decision making; and
   - increase learners' leadership skills.

15. Survey evidence reports learners from across the country as a whole experiencing substantial increases in the use of group work from 2007-2010. We cannot tell from survey data exactly what structures were in place. But the ways in which focus group learners exemplified their increasing experiences of group work suggests that this form of curriculum enactment may well have reflected the structures and processes evidenced by successful schools and by the international research.

16. We have strong international evidence about the importance of structured group work for learning outcomes but we do not have evidence either way about the most effective balance between individual and collaborative learning. Neither our school-based research nor the international evidence provide a picture of a curriculum entirely enacted through collaboration. The suggestion is rather that substantial and appropriate use of planned and structured use of collaboration significantly enhances both learning experiences and outcomes. These changes have taken place during a period of intense policy change and implementation and so it is interesting (and unusual) to note the close match between policy intentions and widespread learner experiences that has developed in a relatively short timescale.

17. *To summarise: the key message for school practice is that structured, collaborative group work is effective in terms of achievement, engagement and conceptual development. It is an increasingly common feature of learners' curriculum experiences in England in 2010. Strategies adopted by successful schools and evidenced empirically from the international research base included:*

   - *providing clear guidance or 'rules' for group working;*
   - *creating curriculum tasks and activities that are genuinely interdependent and which help learners develop the skills they need to work collaboratively in a productive way.*

Theme 4. Fostering a less compartmentalised approach to the curriculum to promote conceptual development and to encourage cross-curricular learning

18. Evidence from both the international and the school-based research revealed the importance of planning learning across the curriculum in order to promote depth in young people's conceptual development. Planned curriculum experiences which made connections between subjects through cross curricular strategies or thematic approaches were also important for overcoming the difficulty learners sometimes had in transferring thinking and learning from one subject to another.

19. Examples from the international evidence base and from the school-based research all involved teachers in joint curriculum planning. There may well be structural and timetabling obstacles to this type of planning, although there is also evidence of the efficacy of such joint planning for staff professional development – CPD.

20. *To summarise: the key message for school practice is that planning learning across the curriculum promotes depth in young people's conceptual development. Involving staff in joint planning is an effective way of organising curriculum development for in-depth conceptual development.*

Theme 5. Engaging learners in assessment

21. Findings from the international evidence base (across a number of curriculum areas) suggest that external pressures to use national test results to inform others of school and individual achievement, may put pressure on teachers to 'teach to the test'.

22. Evidence from the (later) English surveys suggests strongly that learners in secondary schools perceived themselves as increasingly actively involved in their assessment. Similarly, in both primary and secondary schools, learners increasingly believed that they were helped by their teachers to think about how they learned and to plan for the next steps in their learning.

23. Our in depth school-based research suggested that active engagement of learners in their own assessment in successful schools, may be effectively counteracting the risks of limiting learning through teaching to tests identified in the earlier research. Learner responses to the surveys suggest that amongst the wider school population this practice may be more prevalent in secondary than in primary schools.

24. We know from research that AfL has tended to be implemented more in the letter than the spirit. Given the demonstrable benefits for learning of such approaches when they were embedded in school vision and practice, HEIs, school leaders and agencies with responsibility for ITE and for professional development may want to ensure that teachers and prospective teachers are made aware of the underpinning principles and benefits of such approaches.

25. *To summarise; the key message for curriculum design and enactment in schools is that curriculum experiences that engage learners actively in drawing on self and peer reflections of their work as well as on teachers' feedback, and in thinking and talking explicitly about their learning, can help teachers resist what they see as pressures to teach to the test and also help raise achievement.*

Theme 6. Planning appropriate curriculum tasks, planning for challenge

26. The 2009 systematic review of curriculum challenge came about as a result of an initial indication in the first learner survey data that a significant proportion of learners (25%) felt themselves to be under-challenged in their school work. Subsequent survey results pointed to a persistent significant minority of students reporting a lack of challenge. Findings from the challenge review helped to identify a number of policy and practice implications. The latter are derived in particular from evidence of positive impacts on learning of particular curriculum processes. These processes reinforce the international and school-based research. They were:

    - collaborative inquiry and problem solving – developing thinking skills – with guided interaction between learners (i.e. structured group work);
    - constructing challenge by teachers developing a more facilitative and probing role that encourages learners to take increasing responsibility for their learning; and
    - diagnostic tasks to establish learners' starting points and monitor their individual progress in learning so that teachers can construct appropriately tailored challenging curriculum experiences.

27. Constructing appropriate levels of challenge in the curriculum is thus a demanding aspect of curriculum development which involves making connections between a range of already complex tasks. As the focus group outcomes showed, many teachers need support in managing this complexity. In terms of planning curriculum progression, it might now be a useful step to begin to identify and to illustrate the interactions between curriculum design, planning for challenge and assessment. The research tells us these are all important ingredients of progression planning.

28. *To summarise: the key message for school practice is that teachers experience a number of practical difficulties in managing the demands of creating progressively challenging curriculum experiences, and a number of teaching and learning strategies were helpful in tackling these difficulties including:*

    - *building on learners' starting points;*
    - *using strategies such as collaborative problem-solving;*
    - *context-based learning; and*
    - *encouraging learners to take responsibility for their learning by planning in advance activities that would reveal the points at which it is possible to step back .*

Theme 7. Professional development in subject and pedagogic content and the management of curriculum change

29. The international evidence base highlights the importance of effective CPD for all aspects of curriculum development. Benefits for learners include improvements in attainment and achievement and more positive attitudes towards the curriculum. The benefits for teachers include greater confidence in deploying a wider range of strategies and matching these to the needs of their learners and the demands of the curriculum. Teachers also displayed commitment to continuing to learn and to designing new curriculum materials.

30. CPD which promoted such learning benefits included peer and specialist support to encourage, extend and structure professional learning, dialogue and experimentation. These were combined with planned opportunities for collaboration and discussion, focused on developing learner outcomes. They also involved processes for sustaining the CPD over time to enable teachers to embed the practices in their own classroom settings.

31. Evidence from the school-based research also illustrated the conditions in schools that enable effective, curriculum-oriented CPD. Schools that are effective curriculum innovators supported curriculum development through CPD at every stage, aligning the two through collaborative development and design of curriculum materials and resources. The CPD process involved a combination of 'big picture' inputs from leaders and specialists, and hands on workshops delivered through multiple CPD events. These were sustained via coaching by leaders and specialists and collaborative ongoing development work by teachers. Monitoring through observation was used to identify foci for coaching sessions and supportive challenge.

32. In this context, teachers saw CPD as being about doing their job better. School leaders saw curriculum development as being about realising their school development plans. These clearly had an important and positive effect on ownership building. Effective leaders were actively involved; they modelled both the new approaches and the learning behaviours and outcomes they sought for young people and for their colleagues.

33. Curriculum development was embedded at scale through tools and resources adapted by teachers for their own contexts after they had developed their understanding of key issues and underpinning principles. Informed adaptation for context was part of CPD and included use of templates, planning grids and rubrics mediated through peer and specialist support. New curricula are resource hungry. Building capacity for resource development as part of teachers' professional role was crucial to sustainability.

34. Securing progression within years was widely understood as an integral part of curriculum development. But securing progression between years at the same time as securing space for teachers to experiment and adapt curricula was challenging. Explicit and systematic strategies for securing this were in place in only one of the schools involved in the school-based research.

35. The staff survey data about CPD from across the broader range of schools was rather less encouraging. This was not surprising as the examples and models evidenced through the school-based research came from a sample of schools which had been selected precisely because of their proven excellence in curriculum development.

36. A majority of the school leaders of the wider population of schools in the national survey believed that similar approaches to those described above were in place. But the perceptions of middle leaders and classroom teachers were of a more patchy and less integrated approach both to curriculum development and to CPD.

37. *To summarise: the key message for school practice is that structured CPD is an essential component of effective curriculum development and that curriculum development is a strong driver for high quality CPD. Schools that manage to set up a virtuous circle between the two do so through careful alignment of CPD, curriculum development and informal accountability systems. Leadership of CPD is 'hands on' and involves modelling by school leaders plus very careful structuring of collaborative development groups and the tasks allocated to them.*

Conclusions and recommendations

38. On the basis of this accumulated evidence across the three year project we have set out below some of the conclusions and the potential policy and practice implications arising from the core findings. However, this Executive Summary of the synthesis of evidence across three years of extensive data collection is inevitably abstract. So we strongly recommend that practitioners who are responsible for curriculum development on the ground also visit the practical reports of the school-based research and/or the examples from the research literature at http://www.curee-paccts.com/our-projects/qcda-building-evidence-base.

Group Work

39. There is extensive international evidence about the benefits, in relation to both achievement and engagement of structuring group work. The evidence embraces all aspects of the curriculum, from mathematics and science to social skills and citizenship. Carefully structured group work draws into curriculum experiences a wide range of learner perspectives and opportunities to apply and build on interpersonal skills. In doing so it helps develop metacognitive awareness.

40. Schools that are effective innovators in the curriculum found that structured group work had many benefits and played an important role in securing access to the curriculum.

41. *In the light of this evidence teachers and school leaders will find it helpful to consider both how to harness the power of collaboration and to prepare learners for it by:*

   - providing clear guidance for group working;
   - designing tasks that are genuinely interdependent; and
   - creating activities that help learners develop the skills they need to work collaboratively in a productive way.

42. Survey data revealed a substantial increase in the numbers of learners who reported that they experienced learning through group work between 2007 and 2010. This increase took place during a period of intense policy change and implementation. This unusually rapid alignment between policy intentions and learner

experiences took place in the context of multi-faceted support and development structures. *If support of this kind is not provided centrally, schools will need to consider how they can work together to replicate the multifaceted support that successful schools in this study put in place.*

Context-based Learning

43. The international evidence strongly indicates that creating opportunities for learners to make connections between the school curriculum and the 'real world' outside of school enables effective learning to take place. Our school-based research illustrates that this has been happening in schools that are successful curriculum innovators. Such context-based learning has the capacity to enhance learners' subject knowledge and to help develop skills in reasoning and critical thinking. *Schools will find it helpful to consider the potential for context-based learning as a means of enhancing achievement within whatever model of the curriculum emerges from planned national and school level curriculum reviews.*

44. *In considering the potential contribution of context based learning for curriculum development, school leaders and teachers will find it helpful to take account of the three strategies for creating context-based learning that were strongly evidenced in both the work of schools that are effective curriculum innovators and in the international research. These were:*

    - creating conditions in school for learners to draw on their experiences outside of school to support learning in lessons;
    - parental engagement in learning set by the school, as in interactive homework tasks that generate discussion about learning and also shared learning between parents and carers and their children; and
    - community-based tasks.

45. The international evidence base shows that planning for curriculum experiences that connect learning in school, at home and in the community and which involves parents in their children's learning has a positive impact on achievement. Parents can be highly effective in enhancing their children's learning throughout their schooling, not only in the early and primary years. *As parental involvement offers strong benefits, it may be helpful to include in national and school level curriculum review work consideration of ways to raise its profile in curriculum planning.*

Engaging learners in assessment and diagnosis

46. There is strong evidence from the international and school-based research that assessment can raise achievement when assessment processes involve:

    - learners thinking and talking about their learning; and
    - drawing on self and peer reflections, as well as teachers' perspectives.

47. There are many examples of effective assessment for learning (AfL) strategies, including involving learners actively in peer and self assessment. *Teachers need to draw on both their subject knowledge and their experience and knowledge of their own and their learners' learning in order to make their planning and delivery of the curriculum more effective in this context*. But diagnosing what learners know and are already able to do can be difficult. One perceived difficulty expressed by teachers in mathematics, science and English was learners' lack of ability to talk about their learning*. This highlights the need to encourage the development of skills in articulating thinking and existing understanding from an early stage.*

48. Another key challenge to emerge was the practical difficulties in accessing detailed insights into every learner's individual starting points and beliefs when working with large classes. *CPD that helps practitioners access effective strategies and be aware of common patterns and misconceptions in particular subjects has an important role to play here. Ways of providing this could be usefully considered within and beyond*

individual schools. Between-school partnerships and partnerships with others such as Higher Education Institutes in particular, are likely to be important in securing widespread access to the specialist skills in particular subjects and in effective CPD provision. The latter is needed to ensure such CPD feeds directly into benefits for pupils.

49. It seemed from our school-based research that engaging learners actively in self and peer assessment, at least in successful schools, may be helpful in counterbalancing the limitations for learning that external test pressures can generate*. Learner responses to the surveys suggest that, despite significant increases in such practices there may be room for further expansion across all schools but particularly in primary schools.*

50. We know that a major challenge in AfL has been using the specific techniques not simply as an end in themselves but also to generate evidence about learner starting points that can be used to review and refine teaching plans. *HEIs, school leaders and agencies with responsibility for initial teacher education and for professional development may want to ensure that teachers and prospective teachers are made aware of the underpinning principles and benefits of surface level techniques. This enables them to make informed adaptations for particular learning contexts instead of simply revising strategies quickly on the basis of how to insert them efficiently into existing practice.*

Constructing Challenge in the Curriculum

51. The international evidence base showed that constructing appropriate levels of challenge in the curriculum can increase motivation and engagement as well as raising achievement.

52. The evidence highlighted the importance of planning for facilitating independent learning (i.e. encouraging learners to think and act for themselves) as an important part of constructing suitably challenging curriculum experiences. Yet challenge focus group participants explained how hard they found it to resist providing directive support and stepping in to try to accelerate their learner's progress. *Teachers and school leaders may wish to consider the need to plan in advance tasks that will provide the information that teachers need in order to know when it is "safe enough to let go", and for the removal of strategies previously needed to scaffold or structure the learning.* Teachers need support in managing the demands of creating challenging curriculum experiences and planning curriculum progression. *It might now be a useful step to begin to identify and to illustrate the dynamic links between curriculum design, planning for challenge and assessment. Building on learners' existing starting points and using strategies such as collaborative problem solving and context-based learning are both evidence rich strategies likely to be helpful in this context.*

Flexibility in planning the curriculum

53. Evidence from both the international and the school-based research revealed the importance of planning learning across the curriculum in order to promote depth in young people's conceptual development. *Teachers and school leaders may wish to make stronger connections across the curriculum through joint planning between subjects and through cross-curricular strategies or using a thematic approach. These were identified in the international evidence and in our effective schools as helpful in overcoming the difficulty learners sometimes have in connecting thinking and transferring learning between subjects.*

CPD

54. The international evidence base indicates a strong relationship between CPD and effective curriculum development. Benefits for learners include improvements in attainment and achievement and more positive attitudes towards the curriculum. The benefits for teachers include greater confidence in curriculum development linked to the needs of their learners. *As CPD has such a powerful impact, national and school level curriculum reviews could usefully consider the extent to which curriculum oriented CPD is embedded in school practices*.

55. The key message from the international evidence base and from the school-based research is that structured CPD is an essential component of effective curriculum development and curriculum development is a strong driver for high quality CPD. *It would be advantageous to consider the alignment between curriculum development and CPD both at school and national levels. School leaders will also wish to consider how to help ensure that developing the curriculum, schemes of work and specific lessons become the central, evidence-based motor for professional practice; how to ensure that, far from a bureaucratic chore, collaborative planning becomes the means though which teachers collectively realise their aspirations for young people.*

56. Effective curriculum development and professional development both involve combining a number of complex factors and ingredients that attend to both immediate and specific goals and longer term progression. *Schools leaders should consider the selection and refinement of tools as an important ingredient in securing a strong infrastructure for curriculum and professional development.* Examples of tools that teachers and school leaders may wish to consider that featured in this research ranged from local adaptations of holistic approaches such as Building Learning Power, through CPD programmes with linked resources, to much smaller, specific support mechanisms such as learning walls, thinking and talking frames and planning grids.

An overview

57. We believe that one of the most important overall messages from across the project over the three years is this: *Curriculum development that genuinely feeds through into positive outcomes for young people means combining:*

- a focus on both curriculum content and the processes through which it is enacted by teachers and learners ; with
- planning curriculum experiences and tasks that harness and reinforce genuine learning relationships as distinct from purely social peer to peer relationships or didactic teacher to learner relationships
- Systematic underpinning of development via approaches and frameworks that help teachers attend to both immediate goals and purposes and to developing a coherent and progressive curriculum experience.