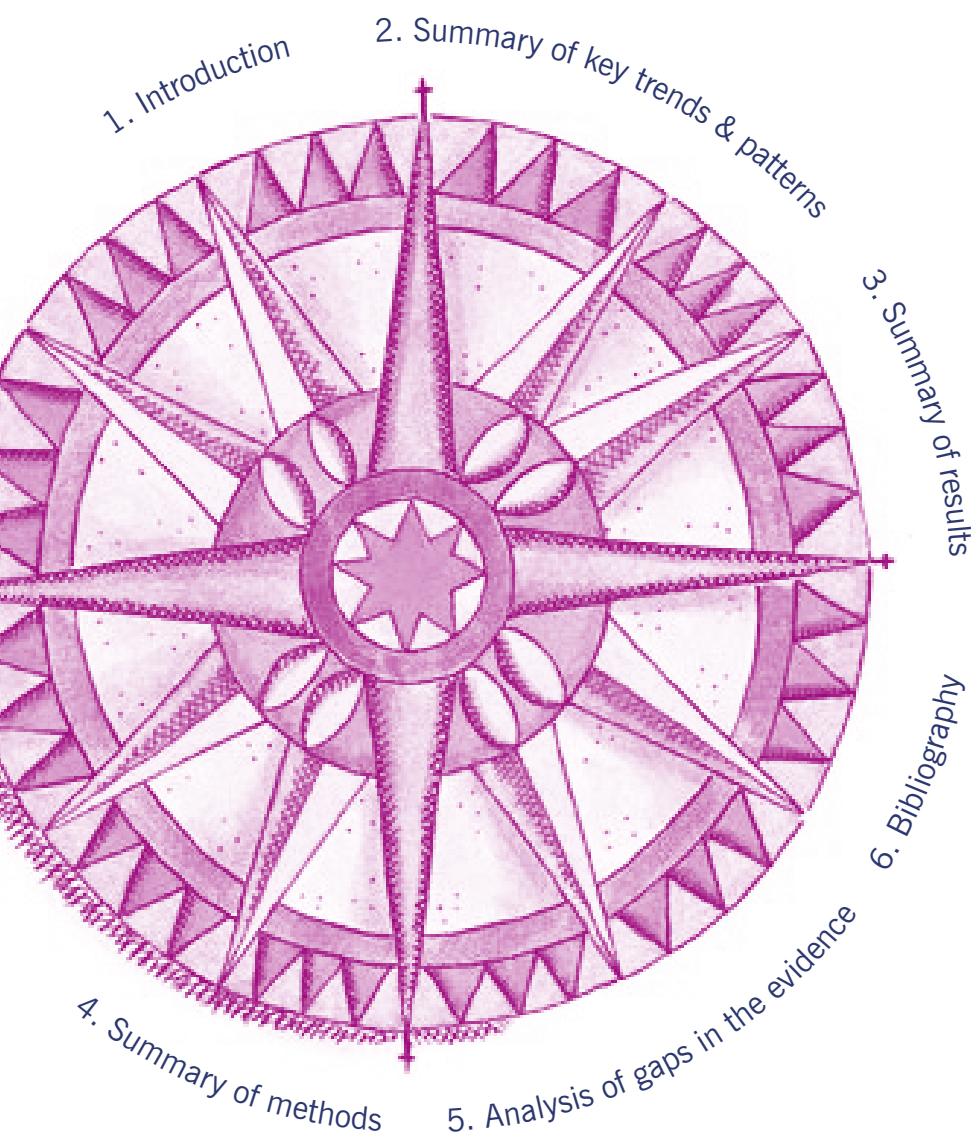


Map of Research Reviews QCA Building The Evidence Base Project:

September 2007 - March 2011

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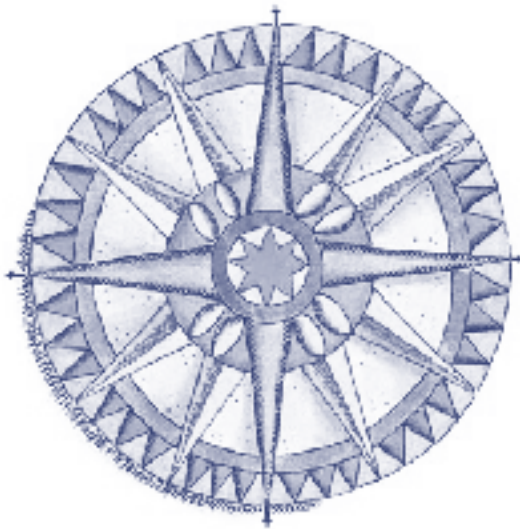
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Qualifications and
Curriculum Authority

Section 1: Introduction



A key element within the Building the Evidence Base for a curriculum or the 21st Century project is to create a series of maps of the contours of the existing public knowledge base. Each successive map will focus on a distinctive aspect of the curriculum.

In recent years (since 2000), research reviews in education have increased both in this country and internationally. Many of these have been conducted under the auspices of the EPPI Centre in the UK, using a transparent and rigorously systematic methodology. Other, more interpretative reviews (such as the BERA User Reviews) have also yielded valuable insights into the cumulative evidence in a variety of curriculum-related areas. In the US the What Works Clearing House publishes the results of their reviews of pedagogical interventions, offering an assessment of their relative impact on learners.

Our first foray into harnessing evidence relevant to QCA's new and wide ranging curriculum framework has therefore taken the form of a "map" of existing reviews of research. This technical report is designed to create a reference point. It describes and analyses the resulting evidence about the range and types of curriculum related research and highlights gaps. It is organised into 6 sections:

- Introduction
- A summary of key trends and patterns emerging from the research base
- A summary of the results
- A summary of the methods
- An analysis of gaps in the evidence
- The bibliography

A 4-page user-friendly summary will be created for diffusion purposes if the technical information contained in the report is thought to be likely to be of interest to a practitioner and policy audience.

The map is intended to help CUREE and QCA with support from QCA's partners participating in the Curriculum Evidence Advisory Panel (CEAP) to:

- identify key issues emerging from the evidence base (whether through evidence provided or through emerging gaps in the evidence);
- consider what role research can play in identifying and responding to the issues schools and others face in developing the curriculum; and
- translate emerging key issues into researchable questions and project plans.

Section 2: Some trends and patterns: an overview of review findings and conclusions

This map of the research reviews was created in December 2007. It is important to note though, that systematic reviewing is a complex process that takes considerable time. Reviewers necessarily use a cut-off date prior to data extraction which means that the research being explored in each of the individual reviews is less up-to-date than the date of publication for the review. Several reviewers nonetheless tackled aspects of their selected foci (Citizenship, Thinking Skills, English grammar teaching for example) over more than one review. So this map reflects high quality and relatively up-to-date evidence across a range of curriculum-related topics. However it should be noted that the focus of the individual reviews was highly selective. The reviews, for the most part, followed the interests of the review groups or organisations (e.g. the What Works Clearing House) and may not have included evidence from large-scale empirical studies (e.g. the Clackmannanshire research into phonics teaching) which fell outside the scope of their particular review question/s. Notwithstanding these caveats the collected review findings represent syntheses of research in several key areas whilst at the same time pointing to significant gaps in the evidence base.

Cross-curricular pedagogies

Perhaps the most striking feature of these reviews from the point of view of curriculum reformers was the consistency with which evidence from a range of different curriculum areas or from different reviewers in the same curriculum area and (in one case) the same review team approaching science research from three different angles found common ground. We would conclude from this that the evidence base in these areas is relatively mature.

In particular (see table), evidence from a number of diverse review topics, including a number of science and maths based reviews, coalesced around six key areas:

1. the effectiveness of learning that is “context based” (dealing with ideas and phenomena in real or simulated practical situations) most notably in reviews of studies in science and maths;
2. the importance of connecting the curriculum with young people’s experiences of home and community and the related, but also distinctive theme of parental involvement in children’s learning in the home;
3. the impact on pupil motivation and learning of structured dialogue in group work and of collaborative learning;
4. the need to create opportunities to identify and build on pupils’ existing conceptual understandings – again, notably in science and maths. Several reviewers also found evidence of unexplored poor understanding or misunderstandings arising from “teaching to the test”;
5. the need to remove rigidity in the approach to the curriculum – to allow time and space for conceptual development, to encourage integration of cross-curricular learning; and
6. the need for excellence and professional development in subject knowledge – without which teachers would be unable to seize opportunities for curriculum innovation, particularly in relation to context-based learning.

We have identified these key areas from review findings which were explicit and consistent about the evidence for their impact/effectiveness. We have not cited reviews in which these issues were speculative or mentioned in passing. However there was very little data in many of the reviews about strong findings emerging from the individual studies and we believe that the evidence base would probably be even more extensive if more reviews were commissioned in any of these six areas – particularly in a wider range of subjects.

There is also consensus amongst the conclusions emerging from many of the reviews in relation to the importance of teacher professional development and initial teacher training relative to all six areas. We have not included reviews of teacher Continuing Professional Development (CPD) in this map because their focus was on teacher professional development and its impact on students, rather than on the curriculum per se. But we would recommend that their findings are taken into account when considering teacher professional development needs relative to curriculum reform.

Table 15: Distribution of reviews against emerging themes

Context –based 11	Community and Home 7	Structured dialogue/ collaborative learning 17	Existing understandings/ misunderstandings 8	Curriculum flexibility/ integrated curriculum 6	Teacher subject knowledge 7
Bennett (3x science)	Deakin Crick 2x citizenship)	Bennett (2x small group)	Anthony	Deakin Crick (2xcitizenship)	Anthony
Askew (primary numeracy)	Anthony	Dyson	Askew (2 x numeracy)	Dyson	Askew (primary numeracy)
Lubben	Dyson	Anthony	Higgins (learning skills / thinking skills approaches)	Gray	Gray
Gray	Askew (2x Numeracy)	Gray	Hipkins	Lord	Kyriacou
Lord	Gray	Kyriacou	Driscoll	Harris	Mann
Puentes	Desforges	Lord	Hogarth	Smith (language & literacy)	Smith (language & literacy)
Hipkins	Nye	Deakin Crick (2x citizenship)	Macaro		Driscoll
Smith (pupil motivation)		Forrest			
McLaren		Higgins (learning skills / thinking skills approaches)			
		Harris			
		Baumfield			
		Hipkins			
		Hogarth			
		Riddell			
		Smith (pupil motivation)			

In addition to the six key findings that emerge irrespective of the focus of the review, the synthesis revealed a number of findings relating to specific review foci. For some of the subject/strategy areas, these can be useful as pointers to the state of research/strength of the evidence. For example, meta analysis of Thinking Skills (TS) evaluations point to a mature and reliable evidence base of the effectiveness of the approach as a whole – yet more research may be needed into the comparative effectiveness of individual TS strategies and/or the particularities of Thinking Skills approaches within specific contexts. We were also struck by the close relationship between approaches described as Thinking Skills and those described as Assessment for Learning (questioning for example.)

In the Informations and Communications Technology (ICT) findings, amply demonstrated below, evidence about the learning benefits of ICT remains patchy and apparently inconclusive. ICT is far from a blunt or universal instrument and teacher intervention and guidance plus an informed match of tools to outcomes across the curriculum seems to be the key to effective use of ICT for learning. Interestingly, while some reviewers found little or no evidence from the studies they examined that ICT was an effective aid to literacy learning, others found research evidence to support it as a useful, efficient and formative assessment tool.

In some subject areas [primary Modern Foreign Languages (MFL)] the research is at a very early stage and there are a few pointers to areas for further development.

Findings from research into inclusion and SEN are consistent with the findings about ‘good practice’ highlighted in the reviews indicated in Table 15 above. The reviewers infer that in effective schools curriculum reform does not need to be treated separately for different groups of students, providing that differentiation is built into the teaching and learning processes. However, as Riddell points out, the reported practitioner experience of inclusion often appears to contradict these research conclusions, suggesting that more attention may need to be paid to teachers’ experience and perceptions, particularly at secondary level.

Specific findings include:

Thinking Skills (TS)

Baumfield:

TS interventions have the potential toenable students to achieve greater understanding, engagement

and higher achievement; teachers ask more questions, which are more open-ended (as in AfL.)

Higgins 1:

Effective processes teachers can use to develop pupils’ learning abilities include:

- structured tasks focusing on specific metacognitive strategies;
- more explicit transactions between teacher and learner about purpose of lessons;
- small group interventions promoting articulation of the strategies; and
- mechanisms to check mutual understanding of goals.

Higgins 2:

There is evidence of positive impact of TS on pupils’ attainment across a range of non-curriculum measures (e.g. reasoning, problem-solving.) Half of the studies [in the review] show immediate positive impact on learning on curricular measures of attainment; there is some evidence that there may be greater impact on low-attaining pupils, particularly when using metacognitive strategies. The role of the teacher is important in establishing collaborative group work, effective patterns of talk and in eliciting pupils’ responses.

Inclusion

Dyson:

Inclusive schools are likely to have a high level of staff collaboration and joint problem solving. Constructivist approaches enable students to learn together rather than separately. The local or national policy environment can act to support or undermine the realisation of schools’ inclusive values.

Riddell:

Recent major reviews reject the idea of essentially different provision.....[yet] the practitioner literature is full of examples of specialist curricula and pedagogies regarded as beneficial for particular groups. Five areas of classroom practice found to be helpful to the inclusion of SEN pupils were: co-operative teaching, co-operative learning, individualised planning, collaborative problem-solving and differentiation.

ICT

Higgins 3:

The review found a positive but weak link between use of ICT and pupil attainment. ICT use is more effective

when planned and integrated with the learning content. Feedback from a computer can help pupils learn. Presenting the same information in different forms can help pupils see connections.

Locke:

There is a mismatch between the multi-media software packages available and those that would be best suited to support responses to text. Electronic and interactive storybooks can motivate young readers – but can become demotivating over time.

Low:

Not enough can be concludedto support policy decisions about increasing the role of computers in language education.

Burn:

This review found a beneficial impact on writing of engagement with digital moving image media; digital moving image media increase motivation.

Torgerson:

There is little evidence to support the widespread use of ICT in literacy learning in English.

Harlen:

Computer-based assessment enabled students to achieve at a higher level than in equivalent paper-based tasks. Using technology probed students' understanding to a greater degree than storing and recording information.... this helped improve students' performance and provided useful information about students' reasoning.

There is a need for professional developmentin the role of ICT in learning, teaching and assessing higher order thinking.

English

Andrews 1:

Formal grammar teaching has no influence on the writing quality or accuracy of 5-16 year olds.

Andrews 2:

Sentence combining is an effective means of improving accuracy and quality in written composition

Modern Foreign Languages

Driscoll:

There is a risk of specialist language teachers importing

inappropriate methods into primary school. Teachers need to use the FL incidentally throughout the day. Resources can be important teaching aids. Games and songs reinforce FL learning. Transition arrangements are needed between phases. The review concludes that there is a need to develop ways to draw on specialist language expertise in the design of assessment instruments – then use generalists' situated knowledge in the administration of assessment.

Citizenship Education (CE)

Deakin Crick 1:

CE can be applied to most areas of the curriculum. CE can enhance student learning and achievement. CE pedagogy may be characterised bydialogue and discussion. It can improve students' communication skills and lead to greater participation. Formative assessment is an important aspect of CE.

Deakin Crick 2:

The quality of dialogue and discourse is central to learning in CE. Studies suggest that CE is the proper domain of all teachers - whatever subject or phase. Transformative, dialogical and participatory pedagogies complement and sustain achievement. Teachers need support to develop professional skills to engage in discourse and dialogue to facilitate CE.

Gearon:

There is a positive correlation between civic knowledge as a student and participation in the political and civic activities of democratic life as an adult.

Kerr:

CE is a hotly contested concept. Debates about the terminology still rage and research is led mainly by commentators and academics with little input from practitioners.

The situation appears fluid and uncertain in schools. There is no consistency across schools as to assessment for citizenship. Most schools are focusing narrowly on citizenship education in the curriculum and have not considered the implications of the active citizenship dimension.

Osler:

One recent large scale survey reported that 40% of respondent schools taught citizenship as a discrete subject.

Section 3: The results

The synthesis draws together material from 64 research reviews. Their characteristics are described and analysed in the following tables. Three main types of review were identified which we have classified as:

1. systematic – i.e. using a comprehensive search strategy, transparent inclusion criteria and a rigorous weighting of the evidence from which to synthesise across the studies;
2. interpretive – i.e. using expert knowledge to identify studies, without a rigorous and transparent weighting of the evidence but with a synthesis; and
3. descriptive – i.e. an account of the research and the relative weight of evidence but with no synthesis.

In some cases we were limited in the useable data we were able to collect. For example, the What Works Clearinghouse based in the US presents hard evidence about the effectiveness of a range of empirically-evaluated interventions but without presenting data about the individual studies. These reviews have nevertheless been documented here because their high level, if rather abstract, findings describe areas of evidence that have been very closely scrutinised and synthesised.

Table 1: The year of publication

Year	Number of reviews
Unstated	4
2000	1
2001	2
2002	4
2003	8
2004	16
2005	13
2006	5
2007	11

There was a very small number of reviews published before 2003, suggesting that education has been relatively slow to follow research practice in other sectors (most notably health) in collecting, calibrating and synthesising the evidence from individual research studies. 2004 and 2005 were clearly bumper years. It is also worth pointing out that we encountered no evidence that systematic reviews (which leave a trail that is easily

picked up at a later stage) were being updated. Four studies were undated.

Table 2: Review publishers

Publisher	Number of reviews
EPPI-Centre	29
What Works Clearinghouse	4
BERA	4
DfES	2
Other	25

45% of the reviews in the map were published by the EPPI-Centre. The publishers in the 'Other' category included Ministry of Education: New Zealand, Scottish Executive Social Research, UCF Center for Autism & Related Disabilities, National Foundation for Educational Research, and education journals.

Table 3: Type of review

Type of review	Number of reviews
Systematic	38
Descriptive	11
Interpretive	15

Number of studies covered by individual reviews

Thirty-six of the reviews mapped the terrain they covered in terms of the numbers of full studies which they reviewed and filtered before arriving at those which met their research criteria. Across these 36 reviews the total number of studies mapped was 5,488. Sixteen reviews mapped between 100 and 500 studies; ten reviews looked at 50-100 studies and six looked at between 10-30 studies. While we do not have this information for the remaining 28 reviews it is evident that between them the reviews covered a wide swathe of curriculum related research.

Number of studies in map	Number of reviews
<10	1
10-30	6
31-50	3
51-70	4
71-90	4
91-100	2
101-200	6
201-300	6
301-400	2
401-500	1
501-600	0
601-700	0
701-800	0
>800	1

Studies in synthesis

The following table deals with the evidence discovered by the reviews rather than the terrain they covered. The findings from each research review were based on a synthesis across the evidence from those studies which met their final inclusion criteria. Where known, the number of studies involved in these syntheses are listed here for each review.

Number of studies	Number of reviews
<10	10
10-30	26
31-50	2
51-70	3
71-90	0
91-100	2
101-200	2
201-300	1
301-400	1
>401	1
Unclear	16

Focus of the review

There was a very large number of individual foci (see bibliography). We have identified groupings within these foci that emerged from our data extractions and also mapped the foci against well-established categories of curriculum content. Two high-level categories of foci emerged – those focused on curriculum content and structure (9) and those focused on teaching and learning processes (28). Table six separates those reviews which focused on teaching and learning from those which focused largely on the content and organisation of the curriculum, and then identifies those specific themes or categories (18) on which the reviews were focused. Of these, ICT, Literacy and Emotional and Social Development featured in as many as nine reviews each, closely followed by Thinking Skills which was a feature of seven reviews.

Although reviews focusing on process or content had distinctive characteristics and findings, there were, of course, also some strong connections since many reviews which focused on teaching and learning processes explored those processes in the context of one or more specific areas of content.

Curriculum content and structure

This sub-grouping of reviews included all the reviews (9) which looked at the content and organisation of the curriculum - focusing on what was taught as distinct from how lessons were taught.

Teaching and Learning

This is by far the largest sub-grouping of reviews we encountered – there were 28 reviews with an explicit focus on teaching and learning processes. It included reviews which focused on the process of acquiring knowledge, attitudes, or skills from study, instruction, or experience plus the process of planning, organising, facilitating and supporting learning activities for others. Table 7 sets out the curriculum contexts in which they took place.

ICT

This category was used for reviews (9) which looked at the use of ICT in the curriculum. It included studies which examined the impact on the curriculum of integrating ICT into lessons and also studies which looked at pupils' ICT skills.

Emotional & social development

Included (9) reviews which looked at pupils' moral

and social skills and learning. This included citizenship education.

Literacy

This category included reviews (9) which examined pupils' learning of literacy skills: reading and writing.

Thinking skills

This term was used for reviews (7) which examined pupils' development of cognitive and metacognitive skills.

Classroom dialogue

This term was used for reviews (5) which examined how dialogue between teachers and pupils, and between pupils themselves, impacts on teaching and learning.

Ethnicity

This term was used for reviews (5) which explored ethnicity as a factor in curriculum development.

Parental involvement

This category included studies (3) which looked at parents' involvement in their children's learning. This could be through parent-school links or just through children's learning in the home.

Numeracy

This category included reviews (13) which examined pupils' numeracy and mathematical skills.

Assessment

This term was used for those reviews (3) which looked at assessment, either national tests or in class, formative or summative.

Motivation

This term was used for reviews (3) that examined factors that impact on pupils' motivation to participate in lessons.

Leadership

This term was used for reviews (2) which examined leadership and its impact on the curriculum, and how it is taught in schools.

Community involvement

This term included reviews (2) that looked beyond the school to the wider community, and considered the interaction between school and community.

Student achievement

This term was used for reviews (6) which focused on impact on student achievement.

Teacher skills

This term was used for reviews (5) which examined teaching skills and teacher skill development.

Health

One review examined the interaction between education and health.

Collaboration between schools

One review examined collaboration between schools and FE colleges in Scotland.

Homework

One review examined pupil attitudes to homework and the impact of homework on pupil learning.

SEN

One review examined definitions of SEN and effective teaching and learning methods for SEN pupils.

Table 6: Focus of the reviews

Focus of the reviews	Number of reviews
Teaching and learning	28
Curriculum content & structure	9
Emotional & social development	9
Literacy	9
ICT	9
Thinking skills	7
Student achievement	6
Classroom dialogue	5
Ethnicity	5
Teacher skill development	5
Parental involvement	3
Assessment	3
Motivation	3
Leadership	2
Community involvement	2
Health	1
Collaboration between schools	1
Homework	1
Special educational needs (SEN)	1

There was a wide variety of foci across the reviews. A significant majority focused explicitly upon teaching and learning processes – in a range of different subject, student and learning contexts. These are not, therefore, mutually exclusive categories.

Curriculum subject focus

Even reviews focussing mainly on teaching and learning processes worked within specific curriculum contexts. Table 7 illustrates the distribution of curriculum contexts encompassed by the reviews. It reveals a strong concentration on English, science, maths and citizenship.

Table 7: Curriculum subject focus

Subject	Number of reviews
English	21
Science	19
Citizenship	13
Mathematics	13
Information & communication technology	6
Modern foreign languages	6
Personal, social, health and economic education	6
History	5
Art & design	4
Music	4
Design & technology	3
Physical education	3
Geography	2
Religious education	2

These categories are not mutually exclusive.

Table 8: Country in which reviews were conducted

Review country	Number of reviews
Unknown	8
New Zealand	1
UK	43
UK: Scotland	5
USA	7

Countries in which studies were conducted

These embraced a far wider range of countries as many of the researchers conducting the reviews designed their searches so as to capture studies across a broad range of international scholarship.

Table 9: Distribution of studies encompassed by the included reviews

Country	Number of studies
Australia	33
Belgium	2
Canada	16
China	1
Germany	1
Greece	1
Ireland	1
Israel	2
Japan	3
Latvia	2
Netherlands	3
New Zealand	3
North America	1
Portugal	1
Romania	1
Singapore	1
Thailand	1
UK	238
USA	258

The majority of studies were from the UK or USA.

Target group for the review

The majority (55) of the reviews focused their review questions on learners (or students/pupils). Many (35) also focused on teachers whilst others included a range of associated target groups.

Population focus	Number of reviews
Government	2
Governors	3
Learners	55
Local authority officers	1
Non-teaching staff	2
Other - student teachers	1
Other (please specify)	5
Other education practitioners	2
Parents	9
Senior management	10
Teaching staff	35

These categories are not mutually exclusive.

Teacher characteristic	Number of studies
Pre-school	1
Primary	3
Secondary	1
Teacher educators	1
Student teacher	2
NQT	1
Experienced	2
Teaching in 2nd language	1
Specialist	5
Female	1
BME	3

Of the reviews examined, 52 did not contain information about the teacher characteristics in the studies included in the review.

Pupil characteristic	Number of studies
Primary age	153
Secondary age	104
Primary and secondary age	26
Urban	3
Suburban	3
Rural	2
BME	38
Refugee	1
EBD	2
SEN	50
Learning in 2nd language	11
Mainstream*	33
High achieving	5
Low achieving	5
Low SES	9
High SES	1
Girls only	3
Boys only	4
Disaffected	2
Nationally representative sample	7

* This term was used to cover students who did not fall into other categories, such as SEN. We can remove this if you do not think it is helpful.

Of the reviews examined, 25 did not contain information about pupil characteristics in the studies. However for those for which we have information it appears that research is addressing itself relatively proportionally to the education system as a whole.

Under 10	10-50	51-100	101-500	Over 500	Un-known
39	93	71	110	96	270

Sample size information was often not available. However for those for which we have information there is a relatively high number of large sample sizes.

Approaches to data collection

Data collection methods used

Table 13 captures the range of data collected by researchers in the individual review studies where these were reported. In addition to the data collection methods presented in the table, 12 single instances of data collection were reported. These ranged from disciplinary referrals to the use of a repertory grid.

Data collection method	Number of studies
Assessment/ achievement data	67
Comparison groups	7
Existing documentation	20
Field notes	9
Interviews	28
Observation	26
Pre/post test	42
Psychological test	3
Questionnaire	28
Video recording	5
Attendance records	2
Case study	2
Discourse analysis	2
Focus group	3
Teacher or pupil logs	8
Post test	3

Table 14: Length of interventions in the study

Length of intervention	Number of studies
Single instance	2
4 weeks	4
5 weeks	1
6 weeks	2
10 weeks	1
12 weeks	1
1 term	37
4 months	3
2 terms	3
1 year	55
2 years	38
3-5 years	25
5 years	7
Unclear	35

46 of the reviews did not contain any details about the length of the interventions. Many of the interventions were long term.



Section 4: Methodology

Research databank

CUREE researchers filtered the results of the inclusive searches to create a map of existing research as represented in research reviews. The map (see tables below) includes information about the focus, methodologies, and location of the different studies featured in the reviews, their scale as well as the evidence and findings discovered. All available details have been systematically captured (see Appendix) and recorded in a custom-built database to enable read-across of patterns and trends in the data. The database creates a record which can be updated in years two and three, as two further research maps are created.

CUREE developed search terms based upon the draft definitions within the emerging project glossary. These were derived from definitions taken from international databases, thesauri and search engines. Generic, published definitions were supplemented where necessary in order to secure relevance to current initiatives, with tentative “place marker” definitions derived from statements from English policy web sites. The search terms were used to seek out research reviews via:

- the EPPI-Centre Evidence Library;
- the Evidence Based Policy and Practice website;
- National Foundation for Educational Research website;
- the Campbell Collaboration website from the US;
- the What Works Clearinghouse from the US;
- the Education Works website from New Zealand; and
- ERIC, BEI, the UK Educational Evidence Portal, IngentaConnect, Education-Line, CERUK, and Regard (ESRC).

Where review authors included pre-existing research reviews as individual studies within their review we followed up citations where this was possible within the timeframe.

We used an inclusive approach to identifying potential reviews, published from 2000 onwards using the following (draft) glossary definitions of curriculum, curriculum development and curriculum innovation.

Curriculum

A structured series of intended learning outcomes and associated learning experiences - generally organised as a related combination or series of planned activities.

Curriculum development

Learning experiences and outcomes specified, planned and realised in order to take account of evidence and information about effective learning processes and opportunities from elsewhere.

Section 5: Gaps in the research identified by the reviewers

The experience of conducting their reviews enabled reviewers to identify gaps in the research in their particular areas of focus. This led many reviewers to recommend areas for further research, which we have collated under the different topic areas below. In some cases the review may have taken place before publication of the results of recent empirical studies, in which case the research will have already moved forward. For example, we have recorded Bennett's observation below - regarding the scarcity of high quality research in the 11-18 range in aspects of science learning, yet we are aware of the recent ESRC-funded Teaching and Learning Research programme's SPRING project, which has considerably expanded the research base in this area.

Reviews take time to complete and must of necessity decide a cut-off date for the studies under review. Hence we would recommend that the gaps reported below need to be updated in the light of recently published research, particularly that which has come out of the TLRP project.

Research gaps identified by the reviewers included:

Citizenship

- Larger-scale studies of cognitive learning and inter-disciplinary research which employs mixed methods
- The impact of family and community based learning and its interrelation with school-based learning (2)
- More empirical research into the implementation of citizenship education. There is currently very little
- Research into who has received training for citizenship in schools, the adequacy and impact of such training and the training gaps that still exist
- Explore the impact of developments in assessment and reporting
- More use made in the UK of international research and curriculum development in schools and teachers education, including curriculum policy, baseline data, cross-curricular learning, classroom practices, leadership and teacher perspectives

Science Teaching

- These reviews suggest a scarcity of high quality research into the use of small-group discussions (and their effects on students' understanding of science or attitude to science) in the 11-18 age range. (But see note about the SPRING project above.)

Primary Numeracy

- Research into the development of children's use and understanding of written numerals
- More English research into mathematics pedagogy and practices and how these are influenced by both the culture of English schooling and teachers' beliefs
- Research which makes greater use of measures and indicators of pupil confidence in order to draw firmer conclusions about the features of the daily mathematics lessons impact on pupils' feelings of self-efficacy concerning the learning of mathematics

ICT

- Insufficient research of high quality to assess the effectiveness of different ICTs in the teaching of English
- Larger studies and more qualitative analysis of the impact on writing of engagement with digital moving image media
- More research into the ways in which new technologies are impacting or can impact on students' production of literary forms
- Classroom-based research by teachers into the use of ICT to support literacy/numeracy
- Research needed on the role of computers in language education
- Rigorous randomised trials of the use of ICT for literacy learning

Primary MFL

- Currently very little research literature. Research needed into the characteristics of effective foreign language teaching to pupils between the ages of 7 and 11
- Investigate models of training that enable teachers to become and remain effective teachers of primary MFL
- Consider to what extent different types of delivery of primary MFL promote effective pupil learning
- Research into primary-secondary transition arrangements to ascertain the ways in which pupils' progression and continuity of learning can be promoted
- Expand the mapping of this area of research through updating the map as new studies emerge
- Encourage research users, especially teacher trainers, and support them in the production of developmental, resource and case study material, drawing on the existing evidence

Thinking Skills

- Further work to identify short and long term

- indicators that can be related to attainment and participation in learning
- Comparative research to evaluate the relative benefits of different thinking skills programmes and approaches
 - Research across a wider range of subjects and age groups
 - A comparison between thinking skills approaches with other educational interventions: provision of guidelines for the implementation and evaluation of thinking skills in classrooms, based on research evidence, would enable schools to make informed choices

Art Education

- Need for more primary, empirical and rigorous research into the effects of art education upon learners
- Further investigation into methodological issues around measuring the social and political impact of cultural understanding upon individuals, their school community and wider society – and the relationship between these impacts

Careers Education and Guidance

- Research on actions and influences that impact on transitions across KS3 to KS4
- Research needed to explore students' gender-based perceptions of particular careers

Homework

- Research into the impact of different types of assignment; homework planners; the use of new technology and different approaches to marking and feedback
- Research into costs and benefits of homework for pupils, parents and teachers, especially at primary level
- The impact of homework on pupil attitudes; identifying effective homework practices for lower achieving pupils and pupils with SEN
- The relationship between homework for younger children and the development of self-regulated learning

Primary Literacy

- Correlation of visual art with reading involving quantitative studies
- Longitudinal studies to determine precise growth in areas of emergent readers' comprehension

Gaps in the research evident from the foci identified in the map

The curriculum research agenda appears to be dominated by English, science, mathematics and citizenship. (The latter is newer, is still short on rigorous empirical studies and definitional debates abound.) We could also point out that the preponderance of English, science and mathematical (though not citizenship) contexts for research was also reflected in CUREE's own four systematic reviews into teachers' professional development which have not been included in this map of research reviews. Interestingly this does not appear to be a function of a disproportionate focus on primary phase research as the studies in the reviews appeared to be fairly evenly divided between primary and secondary, both in this map and in the CPD research.

It is also interesting to note that although many of the review questions were apparently designed in collaboration with practitioners, the concentration on these key areas may reflect academic and/or research funders' interests and concerns. Over the past few years there has been an increase in practitioner research in the UK, and many published reports, case studies and other manifestations of practitioner research are now publicly available. It would be instructive to compare the research foci of the reviews mapped in this report with a similar breakdown and synthesis of practitioner research concerns. Other comparisons between the pattern of available research reviews and current concerns and interests might be helpful to curriculum development and be feasible within later reviews for the Building the Evidence Base project.

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Appendix 1

Data extraction format

QCA Research Maps

Mapping Information for Review of Reviews

Reviewer:

Bibliographic details

Funding

Type of Review

(Systematic, Interpretive, descriptive)

Number of studies in the map

Number of studies in the synthesis

Breakdown of Study Types included in the synthesis

Breakdown of details about the foci of the studies

(Brief descriptions of the specific phenomena or interventions with which the studies were concerned)

Country in which the review was carried out

Countries in which the studies were carried out

Population foci (teachers, pupils, leaders etc)

Brief notes on

Teacher Characteristics (e.g. length of service)

Student Characteristics: (e.g. gender, age range, socio-economic status, learning disabilities etc)

For the studies included in the synthesis

Sample Sizes

Data collection methods e.g. pre and post test, observation, questionnaire

Data analysis methods

Length of the intervention in the studies

Subject focus

Pedagogic focus

Key Findings of the review

Key conclusions and recommendations

Keywords

