

A systematic review of interventions aimed at improving the educational achievement of pupils identified as gifted and talented

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REPORT

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The results of this systematic review are available in four formats. See over page for details.

The results of this systematic review are available in four formats:

SUMMARY

Explains the purpose of the review and the main messages from the research evidence

REPORT

Describes the background and the findings of the review(s) but without full technical details of the methods used

TECHNICAL REPORT

Includes the background, main findings, and full technical details of the review

DATABASES

Access to codings describing each research study included in the review

These can be downloaded or accessed at <http://eppi.ioe.ac.uk/reel/>

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List of abbreviations

ADHD	attention deficit hyperactivity disorder
AEI	Australian Education Index
ASSIA	Applied Social Sciences Index and Abstracts
BEI	British Education Index
CERUK	Current Educational Research in the United Kingdom
CQS	Classroom Quality Standards
DCSF	Department for Children, Schools and Families
DfEE	Department for Education and Employment
DfES	Department for Education and Skills
EPPI-Centre	The Evidence for Policy and Practice Information and Co-ordinating Centre
ERIC	Education Resources Information Centre
GEI	Gifted Education International
G and T	gifted and talented
HAS	high ability studies
IBSS	<i>International Biography of the Social Sciences</i>
IOE	Institute of Education
IQS	Institutional Quality Standards
JAA	<i>Journal of Advanced Academics</i> (previously JSGE)
JSGE	<i>Journal of Secondary Gifted Education</i>
OFSTED	The Office for Standards in Education
REEL	The Research Evidence in Education Library
SES	socio-economic status
SNAP	Scottish Network for Able Pupils
SSCI	Social Science Citation Index
SSRU	Social Science Research Unit
WoE	weight of evidence
WWC	What Works Clearinghouse

Abstract

What do we want to know?

Which types of classroom-based interventions improved the educational achievement of pupils identified as gifted and talented?

What was our focus?

The main aim of this review was to focus on studies that investigated effective outcomes from methods of classroom-based teaching and practice for gifted and talented pupils. This review was guided by the Classroom Quality Standards; progressive and focused statements of quality provision for gifted and talented pupils, creating a self-assessment framework. The aim of this review was to inform future policy decisions and guide subsequent provision and research. Even though the review's primary concern was to inform English policy makers, worldwide studies were included if they were written in the English language. This allowed the review team to consider research findings from a wider pool. The review included studies involving pupils in primary, middle, secondary and special needs schools, aged from 5 to 16. The review was carried out in two stages. The first stage analysed a wide pool of studies using a systematic review map, and the second stage took on a narrower focus and analysed the data using an in-depth narrative thematic approach.

Who wants to know about this and why?

There is an expectation that all English schools and local authorities support the education of pupils identified as gifted and talented. In part, these requirements are a response to parents and schools requesting greater help in meeting the needs of these pupils. The validity and urgency of these concerns was confirmed by those government inspections which reported that sufficient challenge for gifted and talented pupils was uncommon in many mainstream schools (Hansard 1999; Freeman 1998).

What did we find out?

- The review supports the use of personalised learning and differentiation. There was evidence in favour of the appropriate use of streaming, differentiated provision within mixed ability classes, and individualised programmes. However, effective provision within mixed ability classes presumes a positive classroom climate.
- The quality and character of group interactions was identified as a significant factor in the effectiveness of support for gifted and talented pupils. There was evidence that collaborative and group activities helped gifted and talented pupils perform better at some tasks. The role of the teacher was highlighted as especially

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important in promoting and maintaining positive group work.

- Studies showed that enrichment programmes that help gifted and talented pupils develop self-regulation and higher order thinking skills had a positive effect on their achievement and engagement.

What are the implications of this review?

- The review endorses the policy of focusing support for gifted and talented pupils in mainstream settings. The Classroom Quality Standards materials, which emphasise personalised, differentiated learning, are therefore generally well placed to offer specific guidance.
- It is suggested that the Classroom Quality Standards take account of the review findings in future manifestations, especially emphasising the importance of class organisation, group interaction and enrichment strategies that develop skills such as self-regulation and higher order thinking.
- Teachers and schools should be cautious about over-generalising, and of treating gifted and talented pupils as a homogeneous group. It is vital to be sensitive to individual needs and the mediating effects of the teacher, the curriculum and the classroom context.
- Likewise, there is no one strategy or approach to social interaction that will work all of the time with all gifted and talented pupils.
- Most forms of provision for gifted and talented pupils occur in social settings, and pupils' abilities to deal with such contexts are likely to be important factors in academic success and personal motivation. The teacher has an important role to play in generating and sustaining contexts for appropriate social interactions.

- There is an urgent need for funded research focused on English and UK educational settings. In particular, studies are needed that explore the distinctive needs of individual gifted and talented pupils, their social interactions and their pedagogies.

How did we get these results?

In total, 20,947 studies were identified for screening through systematic searches of 18 bibliographic databases of published literature, specialist websites and hand-searching sources. Of these, 101 studies were included for the mapping stage of the review. After the further revision of the review question and additional exclusion criteria, the remaining 15 studies were subjected to in-depth synthesis.

Because the studies are from a range of sources, we need to clarify the key term of 'streaming'. Studies referring to 'streaming' are interpreting the term in its broadest sense. The studies and this review understand the term (in this context) as separating pupils for specific tasks, activities and subjects based on their aptitude for that specific task, activity or subject.

Where can I find more information?

<http://eppi.ioe.ac.uk/cms/Default.aspx?tabid=2400&language=en-US>

CHAPTER ONE

Background

Purpose and rationale for review

Gifted and talented education is a relatively recent feature of explicit educational policy in England. Predictably, there are gaps in the published literature in answering questions related to effective pedagogical interventions aimed at improving the achievement of pupils identified as gifted and talented. Reviews of the literature have been published, but none have used a systematic review methodology (Hewston et al. 2005, Riley et al. 2004, VanTassel-Baska 2004, White et al. 2003, Ziegler and Raul 2000, Freeman 1998).

The main focus for this review included studies that investigated effective outcomes from methods of classroom-based teaching and practice for gifted and talented pupils. This review was guided by the Classroom Quality Standards (CQS), which are progressive and focused statements of quality provision for gifted and talented pupils, creating a self-assessment framework. The aim of this review was to inform future policy decisions, and guide subsequent provision and research.

Policy and practice background

Recent years have seen a radical change in both policy and practice related to the education of gifted and talented pupils. The UK central government introduced a series of initiatives for English schools, such as Excellence in

Cities, Excellence Clusters, Residential Summer Schools and World Class Tests (Morley and Bailey 2006) aiming to raise the level of support to these pupils and to improve the quality of their educational experiences substantially. Government agencies have presented clear expectations that schools and local authorities are required to support the education of gifted and talented pupils (Dracup 2003). In part, these requirements are a response to parents and schools requesting greater help in meeting the needs of these pupils. The validity of these concerns was confirmed by government inspections reporting insufficient challenge for gifted and talented pupils to be common in many mainstream schools (OfSTED 2001).

Research background

This will be the first systematic review conducted of gifted and talented education research focusing on interventions and educational achievement. Other forms of review published in the UK have had different foci, such as that carried out by Freeman (1998). The latter document is of particular relevance to the current project as it reported contemporary research findings concerning the development and education of 'more able' pupils, with a view to improving communication between researchers, policy makers and practitioners. Freeman's study might, therefore, be seen as a kind of precursor to the current review, although methodology, constraints and scope are different.

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Other reviews exist across the world, but these have a broader focus and tend to be critical summaries of research literature in specific subject contexts (e.g. VanTassel-Baska 2004). There are also several edited volumes, but these tend to be collections of papers (e.g. Colangelo and Davis 2003, Heller et al. 2000), rather than reviews of the literature per se.

Review questions and approach

The overall research question for the mapping stage was:

Which types of interventions improve the educational achievement of pupils identified as gifted and talented?

We used a systematic review methodology to identify the evidence with regard to three provisional sub-questions:

- 1) Do school-based interventions for gifted and talented pupils lead to the improvement of their educational achievement?
- 2) Which interventions demonstrate a positive impact on educational achievement?
- 3) Which contexts are most effective in facilitating educational improvement?

Even though the review's primary concern was to inform English policy makers, worldwide studies were included so long as they were written in the English language. This allowed the review team to consider research findings from a wider pool. The review included studies involving pupils in primary, middle, secondary and special needs schools, aged from 5 to 16. The review used an a priori approach for the mapping stage of the review. However, the review became more iterative for the in-depth stage as the review's focus was made narrower to reflect the data and the funder's needs. The review used narrative empirical data.

As the review moved into the in-depth stage from the mapping stage, the aim changed to reflect a narrower focus. This created a need to revise the research questions and develop them

to reflect the narrower aim of the review (see section 2 for the revised version).

Scope and definitional issues

Most countries recognise the need to support pupils who display high ability. However, differences between countries exist in the way that they conceptualise, and therefore provide for, this group of pupils. A result of this varying conceptualisation is a difference in the vocabulary used to describe the group. Within the UK each of the four constituent countries refers to these pupils in different terms: in England and Northern Ireland they are called 'gifted and talented'; in Scotland they are referred to as 'more able'; in Wales they are known as being 'talented' and 'more able'.

This systematic review adopted the terminology of the English funding agency (Department for Children, Schools and Families - changed from Department for Education and Skills in July 2007), namely 'gifted and talented'. Its working definition of giftedness and/or talent was: 'those who have one or more abilities developed to a level significantly ahead of their peer group (or with the potential to develop these abilities)' (DCSF 2007). The DCSF (2008) distinguishes between 'gifted' and 'talented' pupils in terms of the curriculum areas in which they excel: the former relates to high ability in academic subjects, such as English or History; the latter in areas requiring visio-spatial skills or practical abilities, such as in games and PE, drama, or art.

Such definitions were functional, allowing for an examination of gifted and talented education that was broader than the traditional conception of high ability within a narrow range of domains, often restricted to mathematical and linguistic aptitude. It also recognised a wider conception of intelligence than in previous multi-dimensional aspects. This allowed for a wider range of abilities and subject areas, and potentially a more inclusive framework. Studies of both 'gifted' and 'talented' pupils were included in this review.

Other elements of this study required articulation; namely the concepts of educational achievement, population, timescale and intervention.

Given the initial stated intentions of the national gifted and talented initiatives in England, and the regular use of concepts such as ‘underachievement’ and ‘potential to achieve’, it was felt important to note that the impact of gifted and talented provision might be measured in terms of the capacity of individuals to achieve. This reflected the composition of a gifted and talented population in terms of representation of distinct pupil groups, for instance those from minority ethnic groups or from disadvantaged backgrounds. Increasing pupil participation in provision set aside for gifted and talent pupils can be as important as obtaining higher levels of achievement for those gifted and talented pupils already identified and provided for (Smith, 2006). Furthermore, the rationale of these initiatives makes it clear that educational achievement should be interpreted broadly with reference to a holistic view of education, inclusive of development in areas beyond test scores and examinations. This would also allow for achievements usually labelled as ‘value-added’, where the apparent levels of success and achievement may be low in relation to an accepted average, but in fact improvements from baseline to end of project have been very significant.

The target population for this review was school pupils between the ages of 5 and 16, which represents the range of ages experiencing compulsory schooling in the UK.

This study focused on curriculum interventions for gifted and talented classroom-aged pupils. By intervention, we mean planned, discrete curriculum strategies designed to improve achievement. As a guide, any classroom practice within the scope of the published Classroom Quality Standards (Teachernet 2007a) will meet inclusion criteria; reference will also be made to the published Institutional Quality Standards (IQS) (Teachernet 2007b).

The review examined research carried out during or after 1998 but before November 2007. This start date was chosen because it is when gifted and talented education was formally presented as an expectation for all mainstream schools (DfEE 1997). The final date reflects the submission date for the interim report.

Authors, funders, and other users of the review

The team was composed of established researchers and practitioners within a range of experiences and expertise in the areas of gifted and talented education and educational research. It included colleagues already trained and practised in systematic review procedures and other reviewing formats.

Bailey and Pearce were based at Roehampton University and come from a background of mixed methods research and talent development. Winstanley was based at Roehampton University, and is a researcher, writer, practitioner and consultant in the field of gifted and talented education. Sutherland, Smith and Stack worked with the Scottish Network for Able Pupils (SNAP), which has a focus on inclusive approaches to the education of the most able pupils, and is located in the University of Glasgow. Dickenson worked with London Gifted and Talented (an arm of the London Challenge), which provides resources and programmes to teachers and pupils, explicitly targeted towards addressing issues of social disadvantage.

The Peer Review and Advisory Groups were made up of academics and practitioners with expertise in either gifted and talented education or systematic reviewing. It included members from England and other parts of the UK. In addition, the review team drew on the expertise of teacher groups that were regularly convened by London Gifted and Talented, and the Scottish Network for Able Pupils.

The review was funded by the DCSF and managed by the EPPI-Centre, part of the Social Science Research Unit, Institute of Education and the University of London.

CHAPTER TWO

Methods of the review

Type of review

A two-stage review model was used. The first stage consisted of identifying all studies that met the review inclusion criteria. Descriptive information about these studies was collected and presented in the form of a 'map' of research literature related to the education of gifted and talented pupils. The in-depth review was a detailed investigation of a focused subset of the wider literature. The review was focused in a way that corresponded to current policy and practice priorities, such as the Classroom Quality Standards and the Institutional Quality Standards. This required the introduction of a second set of inclusion criteria, developed from a revised and more focused in-depth review question and applied to the studies initially identified in the map. Detailed data-extraction was then undertaken to facilitate synthesis of the final 15 selected studies in order to provide answers to the in-depth review question.

User involvement

Approach and rationale

As well as our Peer Review and Advisory Groups, which included users from a variety of educational contexts, we utilised existing Teacher Groups organised by London Gifted and Talented and the Scottish Network for Able Pupils. We felt this was appropriate and useful as the review was concerned with classroom

practice and the work of teachers of gifted and talented pupils.

Identifying and describing studies

Defining relevant studies: Inclusion and exclusion criteria

The search strategy identified a selection of abstracts, which were then subject to a screening process of exclusion and inclusion criteria. This narrowed the focus of the studies and ensured that only relevant papers were reviewed. Full text versions of all of the papers whose abstracts were not excluded after applying the criteria, were requested for further review.

The following inclusion and exclusion criteria were developed:

Exclusion

EXCLUDE 1. The study was not written in English.

EXCLUDE 2. The study was published before 1998.

EXCLUDE 3. The focus of the study is not explicitly about gifted and talented/highly able/more able.

EXCLUDE 4. The study is not empirical - it needs to be evidence-based, not conceptual or philosophical only.

EXCLUDE 5. Not an intervention - Scope of intervention should be within the parameters of the Classroom Quality Standards (Appendix 7.1 of the Technical report; also refer to Appendix 7.2 for guidance on the CQS).

EXCLUDE 6. Pupils are not aged from 5 to 16 years.

EXCLUDE 7. Study does not report the measure of intervention outcomes.

In-depth review

Moving from broad characterisation (mapping) to in-depth review

As the review moved in to the in-depth stage, the focus narrowed. This created a need to revise the research questions and develop them to coincide with the narrower aim of the review.

The revised main review question was:

Which types of classroom-based interventions improved the educational achievement of pupils identified as gifted and talented?

The revised sub-questions were as follows:

- 1) Do classroom-based interventions for gifted and talented pupils lead to the improvement of their educational achievement?
- 2) What is the effect of classroom interventions on educational achievement for gifted and talented pupils?
- 3) Which classroom contexts are most effective in facilitating the educational improvement of gifted and talented pupils?

The in-depth review excluded those studies that met all of the initial criteria (1-7), as well as the following six additional exclusion criteria:

EXCLUDE 8. The study is not related to the 'engagement of learners and learning'¹.

EXCLUDE 9. The study does not have a 'what works?' focus.²

EXCLUDE 10. The study is not set in 'primary', 'middle', 'secondary' or 'special needs' school.³

EXCLUDE 11. The study is not related to 'learners'.⁴

EXCLUDE 12. The study does not explicitly focus on the teaching and learning process.⁵

EXCLUDE 13. The study does not report on educational achievement.⁶

¹ This relates to the section of the CQS, Appendix 5, page 40, A.1.6.

² This relates to the question regarding the purpose of the study in the EPPI-Centre coding tool, Appendix 3, page 47, B.2.3.C.

³ This relates to the question regarding the educational setting in the EPPI-Centre coding tool, Appendix 3, page 51, C.3.

⁴ This relates to the question regarding sample type in the EPPI-Centre coding tool, Appendix 3, page 52, D.1.1.

⁵ Our interpretation of this phrase centred on the deliberate creation and maintenance of conditions to promote learning, through specifically designed tasks, activities and experiences.

⁶ This refers to how students perform in relation to stated outcomes.

CHAPTER THREE

What research was found?

The review began by identifying 20,947 abstracts over a four month period, 1,285 of which were duplicates and were excluded. 19,662 abstracts were then abstract screened and full text screened if more information was needed. Of these, 130 were included; 29 full texts of the papers could not be obtained and so 101 full texts of papers were coded for the mapping stage. The Review Group applied additional exclusion criteria to narrow the focus of the review, and 15 studies were included in the in-depth review. The data were heterogeneous in nature and so further narrative analyses of the data were needed to create an in-depth synthesis of the data using a meta-empirical approach.

Classroom Quality Standards

In almost all cases, studies related to multiple Classroom Quality Standards. The exclusion criteria sought to remove papers that were not focused on classroom-based, curricular interventions for school-aged pupils, and so it was perhaps not surprising that the most frequently identified standards related to learners and their learning, as mentioned in four of the seven categories. Similarly, it was expected that the 'links beyond the classroom' option was the least frequently (11) cited standard since the focus was on classroom intervention. In all cases, this particular standard was one of a cluster, where the studies referred to multiple outcomes of which extra-curricular provision was just one aspect.

Institutional Quality Standards

In the majority of cases, studies related to multiple Institutional Quality Standards, although generally fewer than the Classroom Quality Standards. The most frequently cited standards were those that related to classroom provision and the curriculum, which linked most closely to the focus of this review.

Sample

The majority of studies specified that their participant age was within the review's age range of 5-16 years old, and the majority of educational settings were based in primary and secondary schools. Some studies included the age range specified by the review as well. Twenty studies did not explicitly state their age range but stated that they were primary, middle or secondary school age.

The studies included samples from the full range of socio-economic groups. Eleven studies explicitly referred to pupils of low socio-economic status (SES); six to middle and high SES; the rest were from diverse groups.

There was considerable variation in the ethnicity of the samples in different studies. Most studies involved mixed groups, although 13 involved a significant proportion of pupils from minority ethnic groups.

In almost all instances, 'giftedness' or a similar description was cited as the cause of a special need. Some individual studies focused on pupils with other conditions, including ADHD, autism, specific learning difficulties and cerebral palsy or reported outcomes for children for whom English was a second language.

All studies included 'learners' as expected, due to the inclusion criteria requirements based on the CQS. However, other participants within the studies were senior management, teaching staff, local education authority officers, parents, non-teaching staff and others.

Study type

All of the studies were focused on 'what works?'. Thirty-four studies were linked to a specific policy or strategy, and these were predominantly linked to local and national gifted and talented policies/strategies.

The most common focus was 'curriculum' (43 studies), which meant that the study was explicitly associated with a subject or curricular area. Other attributes that were cited but are not National Curriculum subjects were themes such as 'leadership', 'social and emotional development' and 'philosophy for children'.

The most common countries were: United States (36), Australia (10), United Kingdom (6), Israel (3) and New Zealand (3). Predictably, the explicitly stated countries were usually the same as those of the actual sample.

Although the majority of studies (69) were published articles in peer reviewed journals, there were 17 articles that were unpublished (e.g. dissertations) or published as reports or conference papers.

CHAPTER FOUR

What were the findings of the studies?

The in-depth review was a detailed investigation of a focused subset of the wider literature on evidence concerning classroom interventions that improve the educational achievement of gifted and talented pupils. The review was also focused in a way that corresponded to current policy and practice priorities, such as the Classroom Quality Standards.

Three themes emerged from the studies included in the in-depth review:

Interventions based on school and class organisation

Overall, the studies that focused on grouping and class organisation suggest that differentiated provision is an effective approach for gifted and talented pupils. Of the various models presented, selective programmes in which pupils move to a new school seem to be the least effective. There is some evidence that streaming, mixed ability provision and individual programmes lead to improved learning for gifted and talented learners, although mixed ability provision requires a favourable classroom climate.

Participation in special gifted and talented classes or schools can sometimes lead to decline in academic self-concept.

Streaming offers an alternative solution to selective programmes for addressing the

problem of differentiating provision for gifted and talented pupils. The review found that gifted and talented pupils in homogeneous groups outperformed their gifted and talented peers in heterogeneous groups. However, they also found that the types of social interactions within the groups, rather than the alternative provision, predicted pupil performance more strongly than either student ability or the overall ability composition of the groups.

A more radical approach to streaming was also examined in the research. This was the 'vertical curriculum model' which allows pupils to be grouped within a school according to their self-perceived levels of readiness, rather than being grouped by age. A vertical mathematics curriculum structure in a primary school resulted in significant increases in mathematics performance for both gifted and talented and other pupils, which may suggest that gifted and talented pupils benefited from placement within a group of peers of similar mathematical readiness and interest, where the curriculum is set at an appropriately challenging level of difficulty.

Finally, gifted and talented pupils who used a self-directed, individualised mathematics instruction experienced significant increases in performance compared to their peers who did not receive the programme. The researchers reported that such personalised learning meant that pupils were able to explore and use concepts beyond those normally taught in the classroom.

Interventions based on social interactions

A number of studies identified social interactions as an important factor in effective provision for gifted and talented pupils. There was evidence that collaborative learning among gifted and talented pupils results in superior performance in an Information and Communication Technology task. This study also found that small groups of gifted and talented pupils generated better planning and solutions than those working alone and this learning transferred to later individual performance.

Some gifted and talented pupils in mixed ability groups performed as well as those in homogeneous groups. Studies also showed that some pupils reacted positively to working with less able peers, but others do not, and this may well reflect and affect the character of their relationships within the group; some dominate discussions and tasks, and others collaborate fully with their group mates. Group functioning tends to be mediated by the classroom climate, so the role of the teacher as a mediator of social interactions is vital.

There is some evidence that allowing underachieving gifted and talented pupils the opportunity to demonstrate and use their talents is effective. This can involve mentoring; the use of creative arts activities; the celebration of a wide range of talents; the development of meta-cognitive strategies; and the development of leadership skills for

gifted and talented pupils. These structured interventions can encourage otherwise reticent gifted and talented pupils to participate more fully.

Interventions based on the development of new skills and strategies

Some studies looked specifically at the development of specific skills or strategies in gifted and talented pupils. There is a view that, in order to fulfil their potential, gifted and talented pupils require different or advanced content and opportunities for higher-order thinking skills. It has been suggested that gifted and talented pupils differ from their peers, in part, by their superior memory, and this could mean that they fail to develop a repertoire of conscious strategies.

Classroom Quality Standards (CQS)

The Classroom Quality Standards need to take account of the review findings in future manifestations, especially emphasising the importance of class organisation, group interaction and enrichment strategies that develop skills such as self-regulation and higher-order thinking.

CHAPTER FIVE

Implications, or ‘What does this mean?’

Strengths and limitations of this systematic review

Limitations

Across the 15 articles there was not one single agreed definition as to what constituted being identified as ‘gifted and talented’. The lack of a clear and agreed definition within the 15 articles offers flexibility; however for practitioners to understand what works, they need to have a clear understanding for whom this will work and they need to be able to match provision with personalised learning goals. Thus the diversity of definitions found in the studies impacts on identification, provision, research findings and implications drawn from the findings.

Potentially useful studies were omitted due to the narrowly focused systematic method used. This meant that there were none from the UK, as no UK studies matched with the criteria formed from the specific systematic review question and so this caused limitations in the extent to which the findings could be related to English policy making.

The Weight of Evidence ratings could only be based on what the author had written in the paper reporting on the study. Therefore judgements were actually made on the study’s ability to explicitly report what was carried out in their study in relation to the answers needed for the systematic review, rather than

the actual quality of their methods, so the WoE ratings in this review were more of an indirect measure of quality through the author’s reporting, rather than a direct unbiased method judging the methods and outcomes of the study itself.

Implications for policy, practice and research

Policy

The national strategy for gifted and talented education in England was intended to provide a distinct programme of teaching and learning for gifted and talented pupils. Initiatives such as Excellence in Cities additionally sought to address issues of inclusion and equity. Organisations, such as London Gifted and Talented, were established with the express aim of addressing the negative effects of social exclusion and disadvantage on achievement. This review set out in part to establish what type of interventions would support the aims of the strategy by identifying research evidence that could inform the further development of the national gifted and talented programme, using studies published since 1998, when the national strategy began.

The IQS and CQS represent a practical working consensus on what gifted and talented pedagogy and practices look like at different stages of development. Their three levels -

entry, developing and exemplary - represent ascending degrees of schools developing capability to personalise provision and, for classroom practitioners, a means to understand how teaching and learning can become more responsive to individual needs. To date, these documents have been informed by conceptions of good practice gathered by expert groups. To a large extent, this review aims to inform future developments in gifted and talented guidance by identifying empirical findings that relate to effective pedagogy.

This review set out to identify what works for gifted and talented pupils in classroom learning, to identify what works in mainstream contexts, and to support the development of practice. Many of the studies also gave evidence of the effectiveness of provision delivered beyond the mainstream classrooms. Generally speaking, policies in England have moved from promoting and funding high cost/low volume enrichment towards an emphasis on providing challenge and high expectations for all pupils as part of everyday learning experiences. The review provided evidence in favour of this policy development.

It is a truism that gifted and talented pupils benefit from learning that is high in challenge, and that teaching sensitive to pupils' needs is most likely to be successful. The three themes discussed in the in-depth synthesis relate to the dynamics of classroom learning and a focus on collaborative learning and flexible grouping. Learning processes are supported through social scaffolding. This supports the hypothesis that social interaction is an effective strategy for the gifted and talented. It may also challenge the emphasis in much guidance on independent learning, which provides extension activities and solitary learning experiences as part of a supplementary strategy.

Practice

The results from Craven et al. (2000, WoE High) do not support selective (i.e., separate) provision for gifted and talented pupils. However, Wood (1999, WoE Low) challenges

this finding, reporting positive outcomes for the pupils in her special class. In light of the evident superiority of Craven et al.'s study, in terms of both research design and analysis, we are led to conclude that planners and teachers should be cautious in considering separate provision of gifted and talented pupils.

The review found the following:

- The diversity apparent in gifted and talented pupils needs to be married to differentiated provision in which gifted and talented pupils, whether as a group or individually, are offered an adopted form of provision or curriculum that reflects their abilities.
- Specific strategies can be taught that enhance gifted and talented pupils' learning and engagement.
- Most forms of provision for gifted and talented pupils occur in social settings, and pupils' abilities to deal with such contexts are likely to be important factors in academic success and personal motivation. The teacher has an important role to play in generating and sustaining contexts for appropriate social interactions.

Research

There is a need for well designed research studies in gifted and talented education with both English and wider UK contexts. If research in the field of gifted and talented education is to influence practice then it is essential that the quality of research design and reporting be improved.

The strongest studies in this review in terms of methodological rigour were often quantitative, yet it would seem that more in-depth qualitative data and analyses might have addressed some of the concerns that the review team had with regards to a general disregard for relevant variables such as: the impact of the researchers themselves; the wider context; teacher attitudes; student motivation; differences in environment between classrooms, schools and districts;

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the implications of using ‘volunteers’ to implement the interventions; teacher experience and education; the existence of multiple exceptionalities; and grouping issues. More research using, or at least incorporating, rigorous qualitative data and analysis would enable these variables to be investigated and the findings from these studies to be tested and firmer conclusions drawn.

Through the data-extraction process, the reviewers specifically identified ethical concerns. It would be advantageous, therefore, if research papers included details of: participant involvement in the design and conduct of the study; recruitment methods; data confidentiality; consent; and funding.

Similarly, it was not always clear how gifted and talented learners were identified or how samples were obtained from the wider populations with the concept of giftedness being presented as unproblematic. There is a need for key terms such as ‘gifted’, ‘talented’ and associated concepts like ‘educational achievement’ to be defined and for identification procedures to be detailed.

It is difficult to draw clear conclusions about generalisable pedagogies due to the large number of variables that can affect pupils, teachers and learning environments. Increasing the quality, quantity and variety of research is one useful response to this difficulty. Comparative studies making use of existing data would be valuable, showing similarities and differences across a range of contexts. This would also help to overcome the problem of small sample groups, which is difficult to avoid in the field of gifted education.

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Appendix 1: Authorship of this report

This work is a report of a systematic review conducted by the Gifted & Talented Review Group

The authors of this report are:

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They conducted the review with the benefit of active participation from the members of the review group.

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Conflict of interest

There were no conflicts of interest for any members of the Review Group.

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Appendix 2: The standard EPPI-Centre systematic review process

What is a systematic review?

A systematic review is a piece of research following standard methods and stages (see figure 1). A review seeks to bring together and ‘pool’ the findings of primary research to answer a particular review question, taking steps to reduce hidden bias and ‘error’ at all stages of the review. The review process is designed to ensure that the product is accountable, replicable, updateable and sustainable. The systematic review approach can be used to answer any kind of review question. Clarity is needed about the question, why it is being asked and by whom, and how it will be answered. The review is carried out by a review team/group. EPPI-Centre staff provide training, support and quality assurance to the review team.

Stages and procedures in a standard EPPI-Centre Review

- Formulate review question and develop protocol
- Define studies to be included with inclusion criteria
- Search for studies - a systematic search strategy including multiple sources is used
- Screen studies for inclusion
 - o Inclusion criteria should be specified in the review protocol
 - o All identified studies should be screened against the inclusion criteria
 - o The results of screening (number of studies excluded under each criterion) should be reported
- Describe studies (keywording and/or in-depth data extraction)
 - o Bibliographic and review management data on individual studies
 - o Descriptive information on each study
 - o The results or findings of each study
 - o Information necessary to assess the quality of the individual studies

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At this stage the review question may be further focused and additional inclusion criteria applied to select studies for an 'in-depth' review.

- Assess study quality (and relevance)
 - o A judgement is made by the review team about the quality and relevance of studies included in the review
 - o The criteria used to make such judgements should be transparent and systematically applied
- Synthesise findings
 - o The results of individual studies are brought together to answer the review question(s)
 - o A variety of approaches can be used to synthesise the results. The approach used should be appropriate to the review question and studies in the review
 - o The review team interpret the findings and draw conclusions implications from them

Quality assurance (QA) can check the execution of the methods of the review, just as in primary research, such as:

- Internal QA: individual reviewer competence; moderation; double coding
- External QA: audit/editorial process; moderation; double coding
- Peer referee of: protocol; draft report; published report feedback
- Editorial function for report: by review specialist; peer review; non-peer review

The results of this systematic review are available in four formats:

SUMMARY

Explains the purpose of the review and the main messages from the research evidence

REPORT

Describes the background and the findings of the review(s) but without full technical details of the methods used

TECHNICAL REPORT

Includes the background, main findings, and full technical details of the review

DATABASES

Access to codings describing each research study included in the review

These can be downloaded or accessed at <http://eppi.ioe.ac.uk/reel/>

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The EPPI-Centre was established in 1993 to address the need for a systematic approach to the organisation and review of evidence-based work on social interventions. The work and publications of the Centre engage health and education policy makers, practitioners and service users in discussions about how researchers can make their work more relevant and how to use research findings.

Founded in 1990, the Social Science Research Unit (SSRU) is based at the Institute of Education, University of London. Our mission is to engage in and otherwise promote rigorous, ethical and participative social research as well as to support evidence-informed public policy and practice across a range of domains including education, health and welfare, guided by a concern for human rights, social justice and the development of human potential.

The views expressed in this work are those of the authors and do not necessarily reflect the views of the funder. All errors and omissions remain those of the authors.

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