A Baseline Review of the Literature on Effective Pedagogies for Gifted and Talented Students

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# A Baseline Review of the Literature on Effective Pedagogies for Gifted and Talented Students

## Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Executive Summary</td>
<td>4</td>
</tr>
<tr>
<td>Introduction</td>
<td>6</td>
</tr>
<tr>
<td>The Process of the review</td>
<td>6</td>
</tr>
<tr>
<td>The concept of pedagogy</td>
<td>7</td>
</tr>
<tr>
<td><strong>Part 1: Identification of gifted and talented students</strong></td>
<td>8</td>
</tr>
<tr>
<td>Testing</td>
<td>9</td>
</tr>
<tr>
<td>Intelligence tests</td>
<td>9</td>
</tr>
<tr>
<td>Achievement tests</td>
<td>11</td>
</tr>
<tr>
<td>Creativity tests</td>
<td>12</td>
</tr>
<tr>
<td>Nomination</td>
<td>13</td>
</tr>
<tr>
<td>Teacher nomination</td>
<td>13</td>
</tr>
<tr>
<td>Parent nomination</td>
<td>17</td>
</tr>
<tr>
<td>Peer nomination</td>
<td>18</td>
</tr>
<tr>
<td>Self-nomination</td>
<td>19</td>
</tr>
<tr>
<td>Multi-method approaches to identification</td>
<td>19</td>
</tr>
<tr>
<td><strong>Part 2: Education of gifted and talented students</strong></td>
<td>20</td>
</tr>
<tr>
<td>Differentiation</td>
<td>20</td>
</tr>
<tr>
<td>Differentiation in the United Kingdom</td>
<td>21</td>
</tr>
<tr>
<td>Differentiation in the United States</td>
<td>21</td>
</tr>
<tr>
<td>Enrichment</td>
<td>22</td>
</tr>
<tr>
<td>Acceleration</td>
<td>25</td>
</tr>
<tr>
<td>Curriculum compacting</td>
<td>27</td>
</tr>
<tr>
<td>Grouping practices</td>
<td>28</td>
</tr>
<tr>
<td>Ability grouping</td>
<td>28</td>
</tr>
<tr>
<td>Cooperative learning groups</td>
<td>32</td>
</tr>
<tr>
<td>Cluster grouping</td>
<td>33</td>
</tr>
<tr>
<td>Mentorship</td>
<td>34</td>
</tr>
<tr>
<td>Distance learning</td>
<td>36</td>
</tr>
<tr>
<td><strong>Part 3: Approaches to gifted and talented provision</strong></td>
<td>36</td>
</tr>
<tr>
<td>Special vs. inclusive provision</td>
<td>36</td>
</tr>
<tr>
<td>National Initiatives in gifted and talented provision</td>
<td>37</td>
</tr>
<tr>
<td>The National Academy for Gifted and Talented Youth</td>
<td>37</td>
</tr>
<tr>
<td>London Gifted and Talented</td>
<td>38</td>
</tr>
<tr>
<td>World Class Arena</td>
<td>38</td>
</tr>
<tr>
<td><strong>Part 4: Issues in the effective education of gifted and talented students</strong></td>
<td>38</td>
</tr>
<tr>
<td>Conclusions</td>
<td>38</td>
</tr>
<tr>
<td>References</td>
<td>41</td>
</tr>
<tr>
<td><strong>Appendix A: The literature review template</strong></td>
<td>56</td>
</tr>
<tr>
<td><strong>Appendix B: Key research papers to guide policy and practice</strong></td>
<td>58</td>
</tr>
</tbody>
</table>
A Baseline Review of the Literature on Effective Pedagogies for Gifted and Talented Students

Executive summary

This review provides a baseline analysis of research evidence, good practice and initiatives on effective pedagogies for gifted and talented education. It is an analysis of the claims in the literature rather than an empirical assessment of those claims, though it does identify the evidence that is most securely based. The review identified four key areas for discussion, namely the identification of gifted and talented, education of the gifted and talented students, approaches to provision, and issues in effective gifted and talented pedagogy.

- Identification: There is a consensus in the literature proposing that multiple methods of identification should be used in the selection of highly able students. Despite this, there is little evidence which examines the relative advantages and disadvantages of these methods. Furthermore, there evidence of cultural, gender and stereotypical bias among identification methods, raising concerns over the validity and effectiveness of such methods.
- Differentiation: The concept of differentiation differs widely among countries and educational systems. This lack of clarity has clouded the research base, resulting in a lack of evidence which robustly evaluates the relative advantages and disadvantages of differentiation methods.
- Enrichment: Due to the large number of, and diverse range of approaches to, enrichment, it is difficult to summarise the current understanding and research. A particular strength of enrichment programmes appears to be the opportunity for gifted students to be surrounded by like-minded individuals. In recent years research has acknowledged the limitation of pulling-out students into specialised enrichment programmes, and has suggested that provision of enrichment activities should focus more on in-class practices.
- Acceleration: There is evidence of positive benefits of acceleration on academic progress. There is some evidence suggesting that there may be some negative effects on social and emotional development, although this is contested.
- Curriculum compacting: There is a consensus that gifted students may already have acquired knowledge of between 40-50% of their lessons before they are taught. The benefits claimed for curriculum compacting lie in providing additional time for students to spend on enrichment and acceleration activities more appropriate to their educational needs.
- Grouping practices: Grouping by ability or attainment has been shown to have positive effects on the achievement of both gifted and non-gifted students. Research into cooperative learning groups has been less conclusive, suggesting that gifted students may often be used as mentors and / or tutors for less able students.
- Mentorship: The research on mentor programmes for gifted and talented students is sparse. Two comprehensive reviews of mentoring highlight the positive effects of such provision for both mentors and students.
- Distance learning: Only a few studies that have examined remote learning programmes for gifted students. However, there is some limited evidence to suggest that such provision provides highly able students with a complementary programme of acceleration and extension.
• A principal conclusion from the review is that research into gifted and talented education has focused on structures and organisational arrangements and largely ignored the well established field of teacher effectiveness, which is more directly related to pedagogy.
• There is a small number of robustly conducted studies which can be used to inform policy. These are identified in Appendix 3.
A Baseline Review of the Literature on Effective Pedagogies for Gifted and Talented Students

Introduction

The purpose of this review of literature is to serve as a baseline analysis of effective pedagogy in gifted and talented education. This review complements and extends the existing reviews, which tend to focus on broader issues than pedagogy. Evidence is drawn from both research reports and case studies of good practice from across the world.

The review surveys and where possible evaluates the claims made within the literature regarding the effective identification and education of gifted and talented students.

The process of the review

Texts were selected for the review according to detailed parameters. The review selected resources from a wide geographical coverage. Appropriate texts were identified by searching:

a) University library catalogues
b) Electronic databases, including the British Education Index (BEI), the Australian Education Index (AEI), the National Foundation for Educational Research (NFER), and the Educational Resources Information Centre (ERIC).
c) Gifted and talented resources published through gifted and talented organisations
d) Government documents and educational reports.

A literature review template was developed. The initial template was taken from Riley, Bevan-Brown, Bicknell, Carroll-Lind, & Kearney’s (2004) review of effective approaches to gifted and talented provision in New Zealand. Modifications to the existing template were made as the review progressed. As recommended by Riley et al. (2004), this template allowed for consistencies in reporting of the findings. The modified template is presented in Appendix A.

The concept of pedagogy

As a concept ‘pedagogy’ has had a long, and contested, history. Robinson (2004) shows that educationalists were attempting to construct general principles of effective teaching in the early part of the 20th century, and she illustrates how debates developed about whether teaching was an art, a craft or a science. (See Robinson, 2004, Ch 4). She points out that included within general principles was an acknowledgement that effective teaching was not mechanistic rule-following, but incorporated a quality unique to the individual teacher – power to teach. One widely accepted definition by Gage (1978) which acknowledges this balance between general scientific principles and the individual’s skill in applying them to particular classes or students, is that pedagogy is ‘the science of the art of teaching.’ This idea challenges or extends the standard dictionary definition of pedagogy as ‘the science of teaching’ (Shorter Oxford English Dictionary)

In the USA in the 1980s, there was an influential set of research studies attempting to delineate the characteristics of effective teaching (See Wittrock, 1986)
These identified the following characteristics of teacher effectiveness, (though this is a summary outline only, for fuller details see Campbell, Kyriakides, Muijs, & Robinson, 2004, Chapter 4): an orderly business-like classroom; objectives shared, clarified and reviewed at the end; transitions between activities that are brief; rules for behaviour established and reinforced; immediate, accurate and constructive correction of student misbehaviour; classroom climate characterised by high expectations and teacher enthusiasm; whole class interactive teaching; immediate feedback to students; opportunities to practise and apply what has been taught; and, variety in teaching strategies. This array of findings was influential in the educational effectiveness movement, and appears to have influenced the national strategies for teaching literacy and numeracy in England. One of the problems identified with this approach, despite its contribution to theorising about pedagogy, is that it treats learning objectives as unproblematic, and eschews analysis of the educational values underlying them (See Pring, 2000). In addition, its emphasis on teaching behaviour is at the expense of a focus on learning, which in most of these studies was measured by standardised tests, usually restricted to mathematics (See Campbell et al., 2004)

A particular concern in England has been the apparent lack of interest in the systematic development of pedagogical principles since the 1994 Education Act, a concern expressed in Simon’s (1981) papers trying to explain why there has been no principled coherent development of pedagogy. Simon argued that part of the explanation lay in educational theorising in teacher training which was disconnected from schools, and partly from the history of education in which Victorian public schools were principally interested in character rather than intellect and partly from the elementary school system in which efficient mass instruction needed no pedagogical underpinning. This had led to a heavy emphasis on pragmatism at the expense of scientific principles. A more recent analysis, drawing on and applying Simon’s framework to the Primary Strategy in England (DfES, 2002), usefully defines pedagogy as ‘the act of teaching together with its attendant discourse. It is what one need to know, and the skills one needs to command, in order to make and justify the many different kinds of decisions of which teaching is constituted’ (Alexander, 2004).

Thus pedagogy is the set of principles upon which effective teaching in classrooms is based, upon which it is justified, and by which effectiveness can be researched and evaluated. A theme emerging from this review is that the gifted and talented literature has focused on structures and organisational arrangements and lacks a consistent conceptualisation of pedagogy.

**Part 1: Identification of gifted and talented students**

The fundamental purpose of identification is to provide opportunities for all children who display giftedness and ability through challenging activities (Freeman, 1998; Sizmur, 1991; Teare, 1997). As Davis and Rimm (1998) claimed, “There probably are as many different strategies and policies for identifying gifted and talented students as there are programmes” (p. 68). Hence, identification itself should not be viewed as a means of labelling groups of students, but should be approached as an opportunity for educators to employ a range of resources to develop a picture of the individual student’s educational strengths, weaknesses and needs.

This section of the literature review discusses the primary principles and strategies for identification of gifted and talented students.
Testing

There are three types of tests used in the identification of gifted and talented students: tests of intelligence, tests of achievement, and tests of creativity. These methods of identification provide information on a student’s ability and attainment and the possible levels of achievement that children should be working towards.

Intelligence tests

Although recent conceptions of giftedness or intelligence increasingly refer to multidimensional models, the tests generally used in the identification of gifted children refer to measurements of general intelligence. No intelligence test is designed to measure all attributes of intelligent behaviour, but, information from an individual intelligence test may be one of the best indicators of an individual's range of knowledge and cognitive skills at a given point in time (Assouline, 1997). In most countries, IQ is one of the most commonly used criteria to determine giftedness. In general, for students with special educational needs, the cut-off point used in an IQ test is at least two standard deviations below the average (IQ between 55 and 70) or above the average (IQ between 130 and 145) (Benito & Moro, 2001; George, 2003). This deviation in IQ score proposes that the child requires modified or special school practices to reach their maximum potential (see Benito & Moro, 2001). The three primary instruments for assessing intelligence are the Wechsler Intelligence Scales for Children, the Stanford-Binet Intelligence Scale and the British Ability Scales (BAS).

Criticisms have been voiced at the use of standardised intelligence tests in the identification of gifted students. These criticisms primarily focus on the inability of such tests to accommodate the linguistic and cultural differences of students from minority language backgrounds (Cohen, 1990). For minority students, intelligence tests are frequently described as exclusionary (Archambault, Westberg, Brown, Hallmark, Emmons, & Zhang, 1993; Coleman & Gallagher, 1992; Shaklee, 1992) and biased (Ford, 1994). Many of the intelligence tests that are available to educators rely on either verbal or written communication in English. Cohen (1990) argued, minority language students may be considered gifted, but may not be able express themselves competently in English. Therefore, many researchers have urged educators to use caution in using standardised intelligence tests for the identification of linguistic and cultural minority students.

Tilsley (1995) raised additional concerns when administering and scoring intelligence tests. First, several measures of intelligence have been criticised as they do not account for definitions of giftedness and the specifications of the range of dimensions on which it is important to recognise high ability. For example, conceptualising giftedness as intelligence only, suggests that intelligence tests provide a sufficient range of dimensions in which to assess ability. However, defining gifted in terms of creative thinking and specific academic abilities, implies that an intelligence test would be insufficient. Moreover, as Tilsley (1995) argued, for highly intelligent pupils their specific academic abilities may not be related to their general intelligence level. Therefore, these students may not be identified through intelligence tests alone. Further, intelligence tests sample verbal, numerical and spatial skills, but do not make an assessment or provide information on real problem solving, investigative abilities, creative thinking or cognitive skills. Among these students, intelligence tests would fail to provide an accurate picture of exceptional ability, and results may be depressed in cases of dyslexic and dysorthographic individuals (Highly Able Children, House of Commons Report, 1999),
Sternberg (1988, 1997) argued that it is not possible to identify and represent giftedness by a single IQ. He proposed three main types of intelligence. Analytic giftedness refers to the academic talent measured by intelligence tests, particularly analytical reasoning and reading comprehension. Synthetic giftedness refers to creative intelligence, or the ability to cope with novel ideas and insightfulness. Practical giftedness involves the ability to apply analytic and synthetic skills successfully to everyday situations. Sternberg argued that individuals possess varying degrees and blends of these types of intelligence. It is therefore not possible to identify these variations in giftedness using a single intelligence test alone.

Second, intelligence tests tend to view intelligence as a general, global, unitary attribute of humans, a standpoint that is criticised within the psychology literature (i.e., Gardner, 1993; Guilford, 1977). Research suggests that intelligence is more of a multidimensional construct, where individuals may possess varying levels of ability on different dimensions. Further, at levels of exceptional ability evidence suggests that the relationship between dimensions may be particularly weak (Detterman, 1993). Therefore, it may be possible for a student to be highly gifted on one dimension, but possess significantly lower ability on other dimensions. A general intelligence test is unlikely to detect these subtle differences as higher scores on one dimension will be offset by lower scores for a second dimension. It is plausible for a student with exceptional ability on one dimension to record an overall score well below the criterion adopted to identify giftedness.

Despite their limitations, intelligence tests have been shown to be extremely useful for identifying children who are underachievers (Davis & Rimm, 1998; Whitmore, 1981), young gifted children at school (Robinson & Chamrad, 1986), gifted children with associated traumas (Kauffman & Harrison, 1986), and in decision making with regard to early admission and acceleration (Feldhusen & Baska, 1989).

Achievement tests

Davis and Rimm (1998) argued that specific academic talents are an important component of giftedness. A number of standardised achievement tests exist which are designed to indicate, as the name implies, the student’s current level of achievement across specific talents and abilities. The primary purpose of these tests is to assist and guide the teacher in gauging students’ basic skills development and understanding.

Achievement tests have often been criticised for their inability to challenge gifted students. They have a low ceiling effect in which exceptionally able students are not offered the opportunity fully to demonstrate their abilities and talents. A considerable number of students may “top out” above the 95th percentile, and it is incorrectly assumed that they are all equally talented. However, further analysis and testing has often showed these students to have a wide range of skills that needs to be provided for within the curriculum (Davis & Rimm, 1998). Similar to the criticisms voiced at intelligence tests, achievement tests are also unable fully to accommodate the needs of students with reading and language difficulties, and culturally diverse educational backgrounds.

Freeman (cited in the Highly Able Children, House of Commons Report, 1999) also raised another argument against using tests of achievement. Achievement tests only make an assessment of what knowledge the child has already gained or achieved, they do not take into consideration the potential of the child to achieve great things in the future.
“If you only measure children who are already achieving you are missing out the rest of the iceberg beneath the water, of children who have enormous potential but who are not already achieving. And this is the great problem with all forms of selection, that you are only selecting those at the very top, and those who could be at the top, given the right circumstances, are lost”

(Highly Able Children, House of Commons Report, 1999, p. xii)

In light of this criticism, it is important to consider Schecter’s (2003) recommendation that test scores should be viewed as an estimate of student’s ability. While a high score is unlikely to be as a result of chance, but a strong indication of ability, a moderately low score is not necessarily due to lack of ability, or lack of potential to achieve.

Creativity tests

Creativity is well established as area of ability where gifted students often excel (George, 2003). As Eyre (2003) stated, creativity is often seen as a component which differentiates between a student who does well, and a student who does brilliantly. However, the concept of creativity is extremely difficult to define, and hence to measure (George, 2003). The Torrance Tests of Creative Thinking (TTCT) are the most widely used means of assessing creativity in children. Torrance (1966, 1974) defined creativity as

“a process of becoming sensitive to problems, deficiencies, gaps in knowledge, missing elements, disharmonies, and so on; identifying the difficulty; searching for solutions, making guesses, or formulating hypotheses about the deficiencies: testing and retesting these hypotheses and possibly modifying and retesting them; and finally communicating the results” (p.6).

Using this definition, he developed the TTCT test to evaluate the effectiveness of educational programmes, and to discover individual abilities.

Researchers such as Torrance (1980) and Getzels and Jackson (1962) have adopted such broader constructs of giftedness, and pay particular attention to aspects of creative thinking and imagination. Much of the research on the psychometric identification of gifted students tends to focus on academic achievement and abilities, whereas research concerning creativity has a more secondary status (George, 2003). Tests of creative thinking also focus more on mental potential and have important implications for differentiated teaching.

Although there is no evidence to suggest that a direct correlation between creativity and high intelligence exists, the inclusion of creativity in the conceptualisation of giftedness, and acknowledging creativity as a specific form of talent, has had broadening effect on attitudes to giftedness (George, 1997). This broadening effect in turn was partly countered the change of elitism of which those interested in gifted and talented education may be accused of (George, 1997).

Nomination

The use of nomination in order to identify and select students for gifted educational provision is a traditional approach (Hunsaker, Finley, & Frank, 1997). There are several forms of nomination, which may include recommendations from teachers, parents, peers, or indeed the individual students themselves. Within the literature, George (1992) and Teare (1997) have both highlighted the importance of
nomination as an identification strategy. However, despite this long-standing approach to identification, the use of nomination has been frequently challenged.

**Teacher nomination**

The judgement of teachers is one of the most common forms of nomination and identification. Indeed, the Ofsted review of gifted and talented provision (2001a) acknowledged that teacher assessment was the main component in the identification of talented pupils. In her school-based study, Welding (1998) found that 41.4% of schools used teacher observation and judgement as an identification strategy. However, despite its frequent use, Pegnato and Birch (1959) found evidence to suggest that "teachers do not locate gifted children effectively or efficiently enough to place much reliance on them for screening" (p. 303). This view was further supported by Kaufmann & Harrison (1986) who suggested that not only was teacher nomination inaccurate, but teachers were also biased against culturally diverse learners.

A recent study conducted by Niederer, Irwin, Irwin, & Reilly (2003) determined the accuracy in which teachers, parents and Progressive Achievement Tests (PAT) for mathematics were able to judge children as mathematically gifted. Teachers were asked to identify gifted students within mixed-ability classes. Of the ten mathematically talented students in the group, teachers were only able correctly to identify five children. Similarly, of the 46 non-gifted students within the class, eight were judged to be mathematically talented. Further, findings from the Niederer et al. (2003) study suggested that teachers' identification of gifted children lay within a standard error of the PAT test. However, it is important to note that use of the PAT only identified 78 per cent of students correctly as mathematically talented. This would suggest that, while as accurate as subject specific tests, teacher nominations may lead to many errors in student identification. Bennett, Desforges, Cockburn and Wilkinson (1984) discussed the difficulties in mis-identification when employing teacher nominations. They found evidence to suggest that 40% of high achievers had been underestimated by their teachers.

Despite the criticisms, some research has provided a more positive perspective on the role of teacher nomination. Gagné (1994) reanalysed Pegnato and Birch’s (1959) data and suggested that the efficiency and effectiveness of teacher nomination was highly related to the number of students identified by the specific identification method. Hany (1993) found evidence to suggest that teacher consistently identified the same type of student as being highly able. Hany (1993, 1997) also concluded that teachers were able to make adequate judgements regarding the presence of high ability among students. In examining the predictive validity of teacher nomination instruments on student performance in gifted programmes, Hunsaker et al. (1997) concluded that nominations based on thinking skills, general gifted behaviour, and special learning skills were significantly related to student's later performance on creativity, group skills and language abilities.

Several important considerations have been raised in the use of teacher nomination for the identification of gifted and talented students have been raised. First, one of the major concerns regarding the potential ineffectiveness of teacher nominations of giftedness is teacher bias and stereotyping (Davis & Rimm, 1998). As indicated earlier, Kaufmann and Harrison (1986) found evidence to suggest that teachers may be biased against culturally diverse groups of learners. Gross (1993) later supported this proposition by suggesting that children identified by teacher nomination alone are likely to come from middle class families. The U.S. Department of Education (1993) found that very low levels of students from African-American and Hispanic student populations were identified for gifted programmes. The report did
not solely focus on teacher nomination, and it would be unfair to suggest that the cultural bias was as a result of teacher judgement, but it highlights the need to consider the cultural diversity of gifted and talented students. The DfES (2002) also acknowledge the problems of identification and teachers need to make allowances for students, motivation, personality and home background. It should also be noted that similar criticism has been voiced at use of standardised tests for their inability to accommodate the needs of more diverse learners.

Second, Coleman (1985) pointed out that pupil age might have a significant effect on teachers’ ability to identify gifted children. In particular it was reported that teachers have more difficulty in identifying younger children in comparison to secondary students. The reason for this finding is unclear. Classroom based observation would suggest that primary school teachers, particularly in Britain, know their students well. Primary school teachers tend to teach the same group of pupils throughout the year, and hence become familiar with their pupils’ strengths and weaknesses. Secondary school teachers tend to specialise in a subject area, requiring them to teach many more students. It is plausible to suggest that teachers would have a better knowledge of individual students at primary age, than at secondary age. However, the results of Coleman’s study do not suggest that this is an important factor in the identification of giftedness.

Third, evidence suggests that the effectiveness of teacher identification relies heavily on the teacher’s knowledge, understanding and training in characteristics of giftedness. Hany (1997) found evidence suggesting that these factors may bias a teacher’s judgements. In Hany’s study, teachers did not fully consider the aspects of giftedness, such as creativity. Hany suggested that teachers tended to have a predisposed mental picture of a stereotypically gifted student, often basing their selection on their previous experience of teaching gifted students. Betts and Neihart (1998) added support to this argument by suggesting that as many as 90 per cent of students nominated as gifted by untrained teachers tended to be high achieving conformists, in that they were the pupils “who often become bored in school but learn to use the system to get by with as little effort as possible” (p. 249). Further, Jacobs (1971) found that kindergarten teachers with little or no training on the characteristics of gifted children tended to over-estimate the ability of children who were articulate, cooperative in class, and who sought teacher approval. Leyden (2002) also supported this proposition by suggesting that able non-conforming students may be overlooked, especially if they are quiet or withdrawn, slow to develop reading and writing skills, produce untidy work, use English as a second language, or have additional special educational needs. Davis and Rimm (1998) concurred with this viewpoint by proposing that bright underachieving students may be overlooked by teachers, along with bright disruptive students and children who display unconventional creativity.

It is plausible to conclude that effective teacher nomination relies on the teacher’s existing knowledge and experience of giftedness, and its associated characteristics. Teachers with a wider understanding of giftedness, may be more inclined to identify the skills of highly able students. Guidance given to teachers in developing their understanding of giftedness has also been shown to improve the effectiveness of teachers’ judgements (Hansen & Feldhusen, 1994; Hany, 1997).

In addressing teachers’ perceptions of giftedness, Lee (1999) conducted phenomenographic research to investigate the identification of young children in an enrichment programme. The teachers in her study described gifted and talented children in terms of excellence, potential, rarity, ability to be noticed, possession of innate talent(s), motivation, and asynchronous development. Lee proposed that it
was important to understand the behaviours identified by teachers, as well as those ignored by teachers, in order to enhance the effectiveness of in-service training and professional development opportunities. Fatouros (1986) also supported Lee’s proposition with evidence suggesting that a lack of teacher training may have a significant impact on the effectiveness of teacher nomination.

Fourth, evidence suggests that difficulties in teacher nomination may arise in specific subjects. Denton and Postlethwaite (1985) investigated the effectiveness of testing secondary school children in four subject areas in comparison to teacher-based recommendations. Results suggested that teachers were more able to identify talented students in mathematics and English as opposed to physics and French. Although it should be acknowledged that these findings may be reflective of individual teacher variation, they also raise some concern over inter-subject differences.

An additional concern in using teacher nomination was raised by Welding (1998) who found teachers lacked confidence and were uncertain about definitions of giftedness. Both Denton and Postlethwaite (1985) and Gear (1979) also stated that in-service training might help teachers identify children. Gear noted that trained teachers correctly identified approximately 86 per cent of gifted students, whereas the untrained teachers could only correctly identify 40 per cent. The Education and Employment Committee Report (1999) on highly able children highlighted the importance of adequate training and support if teacher nominations are to be used in the identification of gifted students. The committee reported that although schools were becoming more interested in identifying highly able pupils, there was a good deal of evidence that, due to a lack of appropriate training, many of these schools were unclear how best to do this. The report also raised the issue that current teacher training, and in-service training courses, did not include sufficient detail about meeting the needs of more able students.

Parent nomination

Another form of gifted identification is the nomination of students by their parents. As Robinson’s (1993) study found, parents are significantly more successful than teachers in identifying giftedness, particularly in young children’s reading and communication skills. Lopez (2000) also suggested that parents are effective nominators of their children. Her research found evidence to support the proposal that parents were aware of their child’s gifts and talents. Therefore, parents are able to provide their school with information about specific aptitudes and abilities that their child possessed. However, despite these positive findings it is equally plausible to suggest that parents may be overly enthusiastic in identifying their child’s gifts and talents. A more recent study by Niederer et al. (2003) found that among 14 gifted students, parents correctly identified them as being gifted in 85.7% of the cases. On the other hand, among the 36 children in the non-gifted group, 52.8% of parents judged their children to be gifted.

Gross (1992) carried out a longitudinal investigation of gifted children. Results illustrated that 90% of parents realised by the child’s second birthday that their child may possess high levels of ability. Parents attributed this identification to their child’s level of questioning, intense curiosity, desire to learn, and unusually advanced sense of humour displayed by the child, as well as the precocity of speech and movement, and in some cases, the spontaneous emergence of reading (Gross, 1993). However, Gross (1993) also found results to suggest that parents who identified to the school that their child may have high ability were often disbelieved by staff. Many parents
felt they themselves may be perceived as a ‘pushy’ parent, and chose not to tell the school in order to avoid any potential negative effects on their child.

Freeman (1991) carried out a longitudinal study, making three-way comparisons between parent-labelled gifted children, unlabelled gifted children and a random control group. Initial findings suggested that there may be a gender bias in the identification of gifted students by their parents. In her study, parents recommended 64.3% of boys and only 35.7% of girls as possessing special gifts or talents. Further, parents cited the behavioural problems and demanding nature of boys as the reasons to suspect high ability. Similar to the suggestion that teachers may possess stereotypical perceptions of gifted children, these results suggest that parents may also hold stereotyped images of gifted boys and girls. The implication of most of the above research is that the use of parent nomination as an identification strategy is on its own problematic.

**Peer Nomination**

Involving pupils in their own learning has become a predominant feature of schools in recent years. The use of peer nomination as a source of identification information dates back to at least the fifties (Jarecki, 1959; Torrance, 1972). However, the use of peer nomination and recognition within the British education system is less well developed (Eyre, 1997).

Gagné (1995) carried out a comprehensive investigation into the students’ perception of their peers’ abilities. He asked pupils, mostly in mixed-ability classes, to choose and rank students in categories of intellect, creativity, socio-affective and physical aptitude. The results indicated a significant gender divide in peer nominations. Boys were recognised for their physical and technical skills, while girls were identified for their strengths in languages, arts and social skills. Despite this evidence that peer nominations may be subject to gender stereotypes, Gagné concluded that students were very accurate in identifying their gifted peers.

In support of Gagné’s findings, Richert (2002) proposed that peer nominations may be particularly useful in identifying creative talent. Richert concluded that because peers have a good basis for judging the imaginativeness and uniqueness of other students’ ideas, they are often able to provide insightful comment about the abilities of their peers. Despite these positive findings, the previous work of Gagné suggests that the effectiveness of peer nomination may be influenced by pupil age. Gagné (1989) warned that pupils in Year 3 or younger were unable to make objective judgements about the abilities of the classmates. Banbury and Wellington (1989) also recommended that peer nomination should not be used with pupils younger than Year 4. They proposed that at this age children were unable to assess the ability of the peers, and were more likely to answer questions on the basis of friendship. As Rimm (1991) also found, many lower elementary school children frequently equate ‘smart’ with ‘fast’. Students who rush their assignments, or do fast-but-poor work, may earn peer recognition by young students.

**Self nomination**

Research investigating the effectiveness of self nomination as an identification strategy is more limited. However, the literature does acknowledge that pupils should be able to take a part in identifying themselves in order for them to understand their own potential. Davis and Rimm (1998) recommend that at the junior and senior high school levels, where peer pressure may cause students to hide their abilities and talents, self nomination may be particularly useful. Renzulli (1987) also
adds support for the use of self nomination, suggesting that in high school, self nomination is the only identification strategy that should be use. Despite these positive findings, it is also important to recognise that self nomination should be a continuous process, in which students are offered opportunities to develop a talent profile that is regularly updated (George, 1995). A ‘snapshot’ or one-off approach to self-nomination may not fully capture all students’ abilities and talents. Likewise, obviously highly able students with low self-esteem, or those who are underachieving, may not nominate themselves.

Multi-method approaches to identification

In more recent years, the consensus among the literature is that identification of gifted and talented students should be by multiple criteria (Freeman, 1998; George, 2003; Pocklington, Fletcher-Campbell, & Kendall, 2002; Teare, 1997; Welding, 1998). Montgomery (1996) argues that one-dimensional methods and tests are not suitable, effective or successful for identifying students as gifted and talented. Bentley (2003) developed this argument further by suggesting that a balance of strategies should be employed by educators to provide a picture of any given student’s abilities. One-dimensional methods of identification, based on achievement and/or intelligence test scores, may result in an under-representation of culturally diverse students in gifted programmes (Richert, 1987). Miller-Jones (1989) further argued the case for multi-method approaches by suggesting that assessments should consist of familiar and culturally relevant situations where procedures and materials are related to the students’ cultural ecology. One-dimensional methods of identification are largely unable to achieve this.

Part 2: The Education of gifted and talented students

Differentiation

Differentiation refers to the “process by which curriculum objectives, teaching methods, assessment methods, resources and learning activities are planned to cater for the needs of individual needs” (George, 2003, p. 105). The definition proposes that differentiation is the process of making the whole of the school curriculum accessible to the learning needs of each individual. Marquez and Sawyer (1994) further state differentiation involves

“curricula designed to enhance the learning potential of the gifted and talented student, should encourage the student to pursue topics in depth at a pace commensurate to student ability and interest, explore unforeseen tangents without the confinement of curriculum parameters, and initiate activities which diverge from the structured format within a framework of guidance and resource appropriate for such exploration” (p. 16).

Research suggests that students are more successful in differentiated classrooms as teachers are able to plan and implement curriculum based on each student’s own level of readiness and move the student forward with skills, knowledge, and educational relevance, rather than teaching all students in the same manner (Ehlers and Montgomery, 1999; Tomlinson, 1995). Furthermore, empirical research has shown that practices of differentiation via acceleration, enrichment and homogenous grouping lead to more successful learning than any one approach employed alone (Shore, Cornell, Robinson, & Ward, 1991). Despite this point, the concept of differentiation appears to differ significantly among different countries and educational systems. Eyre (1997) defines differentiation within the English model as “recognizing individual differences and trying to find institutional strategies which take
account of them” (p. 38). Within this definition, the tendency is to view differentiation as a process which takes place within mixed-ability classrooms (White et al., 2003). On the other hand, research originating from the United States tends to define and view differentiation as a process that may take place in the mainstream classroom, but also encompasses a range of special educational classes for the gifted (Feldhusen & Sayler, 1990; Moon, Swift, & Shallenberger, 2002).

A further important consideration is suggested by Leyden (2002), in that effective differentiation also needs to provide opportunities that cater for the full range of intelligences described by Gardner (1983), not solely the linguistic and mathematical – logical intelligences that are highly valued in western society.

Differentiation in the United Kingdom

There is relatively little empirical research which investigates approaches to differentiation within the United Kingdom though national strategies stress the difference between differentiation by task and by outcome. Further, the literature that does exist lacks a coherent evaluation of the relative advantages and disadvantages of differentiated methods. Despite these limitations, there is general consensus in the literature that a differentiated curriculum is paramount in addressing the individual learning needs of students (Eyre, 1997; Freeman, 1998; George, 2003).

Differentiation in the United States

As previously mentioned, the definition and use of the term differentiation is found to differ greatly among individual research reports and states. Feldhusen and Sayler (1990) referred to differentiation as a series of self-contained and individualised classroom experiences designed to provide a challenging learning environment for the student. The authors advocated the use of specialist classes as these allowed students to be challenged, and to socially interact with like-minded peers. Although Feldhusen and Sayler highlighted that further research was needed to address the social and emotional components of gifted students’ learning, concern was also raised over the effects of specialised classes of the achievement of children with average and low levels of achievement. Feldhusen and Sayler suggested that the removal of gifted students that may potentially be seen as motivators for the less able students might lower whole-school levels of achievement.

Despite the suggestion that differentiation in the United States refers to the provision of specialist classes, Archambault, Westberg, Brown, Hallmark, Zhang and Emmons (1993) found a picture that suggested few instructional or curricular modifications were taking place, particularly among elementary school children. Further, findings suggested that gifted students spend only two to three hours per week in specialised instruction.

A review of gifted and talented policies within the United States raises similar concerns regarding the level of differentiated provision for students. Although federal legislation exists, it does not mandate that gifted students be identified or provided for. A review of state wide policies raises additional concerns regarding the level of provision. Only four states provide gifted and talented programming as mandate, with very strong policies and funding exceeding $1000 per gifted student. On the other hand, 13 states have no legislation, resulting in no mandate for gifted and talented education, and no funding available for students (see www.geniusdenied.com for a review of policies and legislation). Despite these differences between states it should be noted that the four states with mandated gifted programmes are large, while the red, non-mandated, states are much smaller in size. Concern is raised that for the
non-mandated states as many as 435,000 students may not be adequately provided with a specialised curriculum to meet their ability (5% of states’ student population enrolled from K-12; 2002-2003 = 435,184, 2003-2004 = 433,842 omitting District of Columbia which did not provide data for this academic year).

**Enrichment**

A common approach to providing differentiated curriculum for gifted and talented students is the use of enrichment. The concept of enrichment has not only been misunderstood in many cases, but also is characterised by inconsistency in definition (Treffinger, Callahan, & Vaughn, 1991). Broadly defined, enrichment refers to the varied educational experiences that result from a curriculum that has been modified or added to in some way (Davis & Rimm, 1989; Howley, Howley, & Pendarvis, 1986; Schiever & Maker, 2002). Enrichment is the “broadening of the school curriculum to provide increased opportunities within the classroom for pupils to widen their experiences, extend their vision, improve the quality of their school experiences and increase their choices” (Wallace & Pierce, 1992, p. 64). A wide range of educational activities including field trips, independent research projects, artistic creations, and cultural experiences are categorised as enrichment (Boatman, Davis, & Benbow, 1995). The concept of enrichment was introduced to the literature in the 1990s (see Freeman, 1991). However, since this time few studies have examined the relative effectiveness of such programmes.

As a means of improving provision for the gifted, Maker and Nielson (1995) proposed that changes should be made so that a programme for gifted students should be qualitatively different from the programme for all other students. Gallagher (1985) proposed that this may occur in three ways, namely modification to content, method and learning context. Changes to content may include the introduction of enrichment activities to increase variety in learning, the use of higher order thinking skills for the analysis, synthesis and evaluation of ideas, and activities to develop student’s enquiry and problem solving skills. Modifications to methods of curriculum delivery may include a increased use of questioning, pacing, student independence and intellectual risk taking. Changes to the learning context may include the use of withdrawal groups, selective classes or ability groups specifically for gifted students. These changes allow teachers to select a range of approaches that may be deployed in their practice.

Research reports examining enrichment activities often use the term ‘extension’. This term appears to have rather differing meanings and as a result clouds the research base. Enrichment refers to the horizontal extension of provision, whereas acceleration appears to refer to the vertical extension of the curriculum. For example, a range of enrichment opportunities provide additional depth and breadth to the student’s regular learning. On the other hand, acceleration encompasses the early introduction of concepts, topics and ideas, or the delivery of material at a faster pace than other less able students. Both these enrichment and acceleration activities may be classed as forms of extension.

Due to the large and diverse range of approaches that are labelled as enrichment, it is very difficult to summarise the current understanding and research. Several studies have examined the effectiveness of grouping practices as a means of enrichment. These will be discussed in more detail later. Walberg (1995) carried out a comprehensive review of American gifted education and found that pupils in enriched classes did better in school than equally able pupils who did not take part in enrichment.
A noticeable strength of enrichment programmes, such as specialised classes and summer schools, is the opportunity for highly able students to be surrounded with like-minded individuals. Freeman (1991) emphasised that aside from meeting the educational needs of individuals, out-of-school enrichment programmes allow students the opportunity to “be with other people like themselves, so that they can relax and drop the energy-consuming defences which they normally use for support” (Freeman, 1991, p. 215). In this environment, Freeman concluded that while it was difficult to ascertain the benefits of enrichment on the academic needs of students, there was evidence to suggest that enrichment opportunities provide social learning and improvement in interpersonal relationships.

On the other hand, there are a number of issues and concerns in the use of enrichment classes. First, the use of pull-out programmes and separate activities removed from the mainstream class may result in some separation between the exceptional children and the remainder of the class. Shahal (1995) found that students who received separate gifted classes felt isolated from others and their weekly absence caused peer-group problems, although both pupils and parents felt that they were more challenged and did better academically in the gifted classes. More recent research has acknowledged this limitation and suggested that more emphasis needs to be placed on the provision of enrichment activities within the classroom (Eyre, 2002; Teare, 1997). This issue is in part being addressed, and Ofsted (2001b) have acknowledged that most schools with gifted and talented funding are providing extension activities to supplement classes and resources. Ofsted (2001a) suggested that extension activities, such as those provided by EiC, tend to have a positive effect on motivation and self-esteem. However, it should be noted that less evidence was presented to support the use of enrichment activities for increasing achievement and attainment. Ofsted (2001b) also raised concern that enrichment activities frequently tend to be subject specific and not provided across the full range of the National Curriculum. In addition, Freeman (1997) recognised that enrichment activities may heavily rely on both funding and the availability of enrichment resources in the area. As enrichment support systems in the area will vary, the provision of a school’s enrichment activities may heavily depend on its location.

**Acceleration**

A second common approach to providing differentiated curriculum for gifted and talented students is the use of acceleration. Van Tassel-Baska (1992) states that acceleration should refer to the rapid rate of the child’s cognitive development, as opposed to the educational intervention provided. Common forms of acceleration are early entrance to school and / or college, grade skipping, advanced placement in certain subjects, college course enrolment while still in compulsory education, and special fast-paced classes. As Jones (1983) commented, within England, programmes tend to be based on allowing students to be accelerated between the school programme and allowing them to take a greater number of examinations. Jones acknowledged that this approach to acceleration tends to focus on quantity rather than quality. The review of literature on acceleration has provided a consistent picture of research over the last 35 years (see Benbow, 1991; Kulik & Kulik, 1984; Van Tassel-Baska, 1992 for reviews). Practices of acceleration have a strong basis of research support and are recommended more often than any other practice for the education of the gifted (Shore et al., 1991). Acceleration appears to have some overall positive impact on the achievement of gifted individuals.

More recent research into the long-term effects of acceleration suggest positive results in cognitive development from acceleration, and no negative effects
on social and emotional development (Richardson & Benbow, 1990; Swiatek & Benbow, 1991). Further, many studies have shown that accelerated students have significantly higher levels of achievement than equally gifted non-accelerated peers, and equally gifted older classmates (see Kulik & Kulik, 1984; Swaitek & Benbow, 1991).

Toth (1999) raised an important benefit of accelerated learning programmes. As Toth demonstrated, grade acceleration offers gifted students a more challenging learning environment. In grade acceleration students may be accelerated to a peer environment where they might need to compete against older and more able students. While this may not be seen as initially beneficial, Toth concluded that this sense of competition and possible failure may help students adjust to later schooling and life. Rimm and Lovance (1992) supported this suggestion by stating:

“If we don’t provide a challenging environment, we are, in a de facto way, teaching our children to underachieve. If for years “being smart” is easy and fast, we can’t expect them to cope well with their first challenging experiences when curriculum becomes more complex, nor can we expect them to cope easily with being second or third or tenth in competition if their early years in school provided them only with “being first” experiences”

(Rimm & Lovance, 1992, p. 10)

A meta-analysis of studies on a variety of acceleration programmes showed that, overall gifted and talented students are equally or more successful academically in accelerated programmes when compared with gifted and talented same age, non-accelerated, and talented students (Kulik & Kulik, 1984). However, the meta-analysis did not take into account the longitudinal effects of acceleration after compulsory education.

Despite these positives, there is some evidence suggesting that acceleration, and in particular, practices of early entrance into school and college are risky approaches to serving the needs of gifted and talented children (see Southern, Jones, & Fiscus, 1989). Several possible suggestions have been offered by researchers which question the benefits of early entrance and grade-skipping. There is the potential that students may a) lose their academic advantage in later school life, b) experience difficulties in emotional and social development as a result of lacking the maturity of their older classmates, c) lack the social and academic maturity to handle the stresses of acceleration, and d) become arrogant and elitist in their attitudes towards others (Daurio, 1979; Kulik & Kulik, 1984; Southern et al., 1989; Stanley, 1980).

Regarding the social and emotional concerns over acceleration, while a decline in academic achievement may be more noticeable, social and emotional concerns may be more subtle, less amenable to teacher intervention and hence, may be more harmful to the student (see Southern et al., 1989). The general view is academic concerns may be noticed sooner, and hence the choice and use of acceleration strategies may be reviewed as appropriate. On the other hand, more subtle social and emotional concerns may go unnoticed and may ultimately be damaging to the student. While it is important to consider the social and emotional concerns of students who are accelerated into a more suitable learning environment, Benbow (1992) argued that in many cases accelerated students may find a higher degree of social acceptance and more in common with other students. In addition, Noble, Robinson and Gunderson (1992) found no evidence of long-term social concerns among accelerated students. Noble et al. found that accelerated students contacted in later life showed support for their own accelerated provision.
Furthermore, as Benbow (1992) stated, while social and emotional factors are important, the overriding issue of concern should be the educational needs of students, and accelerated provision appears to enhance the academic achievement of gifted students.

Some research evidence has raised concerns regarding potential gaps in the knowledge of accelerated students or poor retention of material learned at an accelerated pace (see Van Tassel-Baska, 1989; Swiatek & Benbow, 1991). However, there is limited evidence to support this suggestion. Swiatek and Benbow (1991) highlighted that the potential risk of student burnout is outweighed by the higher risk of underachievement due to student boredom if gifted students remain in regular classrooms. Furthermore, research in the 1980s suggested that boredom in a classroom may lead to other adjustment difficulties such as social withdrawal or lack of self-discipline (Compton, 1982). Regarding the retention of student information, the review has not found any evidence to suggest that students who have been accelerated exhibit deficits in knowledge and achievement (Kulik & Kulik, 1984; Proctor, Black, & Feldhusen, 1988; Swiatek & Benbow, 1991).

**Curriculum compacting**

Curriculum compacting is the modification or streamlining of the curriculum for students who have demonstrated mastery of the curriculum content or who clearly have the potential to cover material in a fraction of the time their peers require (Renzulli, 1994). As opposed to repeating material which the students has already comprehended, which often leads to frustration, boredom, and underachievement (Allenback, 1995), teachers are able to increase the challenge level of the curriculum by adding enrichment activities, acceleration or independent study time for students. Reis (1983) further supported this proposition be suggesting that educators are “deluding” themselves if they believe that a series of enrichment or extension activities is sufficient to fulfil the needs of very able students. Curriculum compacting works from this premise that provision for gifted and talented students should be accommodated into the regular classroom as this is where students tend to spend most of their time. There are three major benefits to curriculum objectives, a) to create a more challenging learning environment, b) to guarantee proficiency in the basic curriculum, and c) to create additional time for more appropriate enrichment and acceleration opportunities (Renzulli & Westberg, 1994).

Reis and Renzulli (1992) carried out one of the most comprehensive studies of curriculum compacting. The authors found that teachers reported that not only identified students, but other highly able students benefited from compacting. Bright, but underachieving students commented that eliminating assigned work and replacing it with projects and work that met their interests better was highly motivating. Research into curriculum compacting has indicated that high achieving students may already know between 40-50% of their lessons before they are taught (Reis, Westberg, Kulikowich, Callard, Hébert, Plucker, Purcell, Rogers, & Smist, 1993). Evidence also suggests that for gifted students, if teachers eliminate as much as 50% of the curriculum, there is no difference in test scores. Furthermore, teachers are able, with minimal training, effectively to identify and eliminate material already mastered by the students (Reis et al., 1992).

Reis, Westberg, Kulikowich and Purcell (1998) later summarised some of the reasons not to adopt curriculum compacting. First, teachers have voiced criticism over a lack of sufficient teacher preparation time to assess and differentiate pupils. Second, teachers have reported that they view their time to prepare supplementary lessons and material as limited. Third, financial concerns are often raised, suggesting
that there are limited or insufficient funds to provide additional enrichment materials necessary for supplementary learning (see Westberg, Archambault, & Brown, 1997). A final concern of teachers is that some students whose curriculum is compacted, may not score as highly on standardised measures of achievement. Reis et al. (1998) proposed that some teachers may be reluctant to eliminate important material in case achievement scores are lowered.

Grouping practices

Ability grouping

Van Tassel-Baska (1992) defines ability grouping as the organisational mechanisms by which students at proximate ability levels within a school curriculum are placed together for instruction. The concept of ability grouping stems from cognitive psychologists’ approaches to teaching and learning. Cognitive psychologists recognise the need and emphasis on the social nature of learning and suggest that optimal learning does not necessarily occur when students are sitting quietly in their seats, stressing the importance of schools and classrooms as communities of learners (Marshall, 1992; Sergiovanni, 1993; Shields, 1996).

A major benefit of ability grouping is that it may promote a unitary programme of intervention that is dominated by the needs of the learners. Further, the opportunity for students to be grouped with like-minded students, whether in cross-grade, cluster groups, instructional grouping, or co-operative grouping, offers socialisation opportunities that may not normally be available to gifted students (Van Tassel-Baska, 1992). A review of studies investigating the effects of grouping practices demonstrates evidence favouring the use of such strategies. Kulik and Kulik (1984) suggest that, not only does ability grouping raise achievement among gifted students, but the achievement of other groups of student does not appear to be hindered by such practices.

There are a wealth of studies examining the effects of both between-class and within-class ability grouping. Between-class grouping refers to school practices of forming classrooms that contain students of similar abilities. Within-class grouping refers to the teacher’s practices of forming groups of students with similar abilities within an existing individual classroom (Hollifeld, 1987). Slavin (1986) carried out one of the most comprehensive reviews of different types of ability grouping practices in elementary schools. The purpose of his review was to identify and evaluate the grouping practices that promoted the highest levels of student achievement. Slavin’s evidence on within-class ability grouping suggests that there are positive effects of using this practice on student achievement. However, it is important to note that these positive benefits and effects tend to be more noticeable for low-achieving students than high-achieving students. Furthermore, the research on ability grouping has tended to focus on numeracy and literacy classes, with only limited research examining the effects of ability grouping within other subject areas.

Gallagher (1993) reported that ability grouping was particularly beneficial for highly able students as they were then able to participate in accelerated learning programmes. The use of ability grouping in this context allows students additional time to focus on new or extended material, as opposed to being held back by their lower achieving classmates. However, Kulik and Kulik (1990) indicated mixed findings for the effects on ability grouping and academic achievement. Likewise Slavin (1987, 1990) found limited evidence to suggest that ability grouping had a significant effect on achievement. Ireson, Hallam, Mortimore, Hack, and Clark (1999) suggested that studies investigating opportunities to learn through differences in
curriculum and pacing of lessons tend to find more support for the use of ability grouping. On the other hand, when groups proceed at the same pace and cover the same curriculum there is little difference in learning outcomes (Hallam & Toutounji, 1996).

In support of ability grouping, Freeman (1997) presented the argument against mixed-ability teaching that, although pupils in the class should follow the same theme of work at differing depths, most classroom teachers have a tendency to pitch their classes at the middle range of pupil ability. Highly able students tend to be hindered by the general teacher notion of presenting information three times — first, to introduce the material; second, to remind the pupils; and third, to summarise and reinforce. Gifted students are more likely to absorb the information in the first instance, and do not require the repeated exposure to information. In this context, high ability pupils would benefit from ability groups that would meet their learning needs more appropriately.

An important note that has been highlighted in the review is the use of the terms “grouping” and “tracking”. These two terms appear to be often used interchangeably. As Nicholson (1998) proposed, the term tracking refers to the practices of layering age groups into separate classes based on ability and / or achievement. Ability grouping refers to the identification of students for the purpose of providing them with a differentiated curriculum appropriate to their level of learning. Nicholson urged caution when using these two terms, and suggested that practitioners should be fully aware of the differences between these two practices when interpreting research. Feldhusen and Moon (1992) further made a distinction between grouping and tracking by suggesting that tracking referred to a special sequence or programme of classes with other students of similar general ability for a relatively long and sustained period of time. The practice of tracking is a relatively rigid process in which students are assigned to a particular track early in their school careers. There are usually limited or minimal opportunities for students to change track after this initial assessment. On the other hand, grouping refers to a more flexible process based predominantly on prior achievement in particular subject areas. Movement in and out of groups may be possible at many points of the student’s school life, as new talents and abilities emerge, grouping placements may be adjusted accordingly.

A criticism that has been voiced at ability grouping is that such groups are discriminatory, elitist and even detrimental to the education of other students (Toth, 1999). Shields (1996) also criticised ability grouping practices for discriminating against lower socio-economic and minority students. Gallagher (1993a) reported that the practice of ability grouping frequently results in a disproportionately high number of black and Hispanic students in special education programmes with students who were classified as having learning difficulties. Gallagher attributed this finding to the disproportionate number of black and Hispanic students who have failed earlier grades, and hence were referred to special education programmes. He also found that a disproportionate number of Asian students were found in gifted and talented ability groups. These findings may be attributed to social class and cultural influences affecting the amount of time students spend on academic work. However, the review has highlighted that the effects of ability grouping on both highly able and less able students needs to be taken into consideration.

Hertzog (2003) found evidence to suggest that many students feel negatively about being separated into gifted groups to take more challenging coursework. Most students in their study expressed a frustration about being part of a “gifted group”, as if it was a type of label. These frustrations were particularly notable as students left
elementary school. Many students reported a stigma associated with being part of a
gifted programme, with an overall sense of being separated and segregated from
other students. Hertzog reported that the finding was particularly salient for students
who were placed in separate classrooms within a school, but still attended general
classes for some periods of the day. Respondents also cited being further labelled as a
“nerd” and being “picked on” or ostracized by their peers.

Herzog (2003) raised additional concerns over the effects of ability grouping
on the level of education. Students indicated that they felt teachers in their gifted
classes were better teachers, more enthusiastic and more experienced than there
teachers of general classes. Respondents indicated that they felt teachers were
happier when teaching gifted classes as the students were more willing to learn and
were more likely to do their homework.

Cooperative learning groups

On the other hand, co-operative grouping of students does not appear to
enhance the achievement of gifted students. Further, the evidence is that such
groups frequently use gifted students as mentors or tutors for the remainder of the
group. This has been shown to increase levels of boredom and frustration among
gifted students. Shunk (1987) presented evidence to suggest that lower ability
students do not model their behaviour on gifted students. Hence, the argument that
high and low ability students should be mixed or higher ability students may facilitate
the learning of less able students is not supported. Salomon and Goberson (1989)
found additional evidence to suggest a possible negative social effect on cooperative
learning. They proposed that the negative effects of heterogeneous group
composition may effect motivational processes, meaning that motivations of lower-
ability students in mixed-ability groups could be reduced by the “free-rider” effect:
low-ability students remain passive while the more able students do the work. Hence,
the lower-ability students have the most to gain from cooperative groups.

On the other hand, highly able students may suffer from the “sucker effect”,
where they feel exploited as tutors of the less able, held back and less productive
(Robinson, 1990; Ross & Smyth, 1995). Gallagher (1993b) stated that, for this
reason, mixed-ability groups do not tend to challenge the gifted learner sufficiently.
The finding of these studies should be interpreted with caution as they tend to refer to
high-achieving students, or high-ability students. While this may include gifted and
talented students, it is frequently unclear in reporting whether they reflect to the
learning of gifted students, or the learning of high-achieving students. Furthermore,
studies into cooperative learning have tended to focus on a small handful of learning
activities. It is plausible that some subject areas, or learning activities, may be more
suitable for cooperative and mixed-ability grouping practices than others. Future
research should investigate this issue more fully.

Robinson (1990) stated that practices of cooperative learning seem to be
effective in teaching some basic skills, but its value in teaching highly able students is
questionable when cooperative learning groups are heterogeneous. Kulik and Kulik’s
(1984) meta-analysis findings tend to differ from the researchers who have criticised
practices of ability grouping. Kulik and Kulik reported small positive effect sizes on
achievement of high ability students and that the effects of grouping were near zero
on the achievement of average and below average students. Furthermore, they
reported that “students appeared to like school subjects more when they studied with
peers of similar ability, and some students in grouped classes even developed more
positive attitudes about themselves and about school” (Kulik & Kulik, 1984, p. 420).
Cluster grouping

Schuler (1998) defines cluster grouping as an administrative procedure whereby students who have been identified as gifted and talented at a given grade level are grouped together and assigned to one classroom with a teacher who has special training in educating gifted students. The practice of cluster grouping has become increasingly popular as a programming option to meet the needs of gifted and talented students within the heterogeneous classroom, particularly within the United States (see Gentry, 1996; Hoover, Sayler, & Feldhusen, 1993). However, although cluster grouping is consistently suggested as an educational option for gifted and talented students (Brown, Archambault, Zhang, & Westberg, 1994; Kulik & Kulik, 1991; Renzulli, 1994; Winnebrenner & Devlin, 1991), there is very little evidence regarding the impact of cluster grouping on students (Hoover et al., 1993).

Schuler (1998) carried out a review of cluster grouping practices across the United States. She found that cluster grouping may have a positive effect on the achievement of all students. Respondents indicated that positive effects for gifted students included more time to work together on appropriate tasks, higher class expectations, more in-depth and quality products, increased motivation and learning, more opportunities to work on or above the standard level of instruction, increased student responsibility, and more time to work with intellectual peers. Teachers responded that cluster grouping helps to pace the curriculum faster, training had helped instruction, and using curriculum compacting gave them a better understanding of the learning process and how to challenge students. Furthermore, cluster grouping enabled the teacher to do more formal differentiation of the curriculum.

Despite the limited research evidence, Gentry (1996) detailed a number of benefits to cluster grouping. These include:

- Cluster grouping is cost effective, often a useful resource in schools which are unable to afford additional personnel for a gifted and talented programme (see Hoover et al., 1993; Winebrenner & Devlin, 1991).
- Students are clustered with their intellectual peers. Schunk (1987) and Kulik and Kulik (1991) suggested that students should be grouped together with like-minded peers as students tend to learn and achieve the most when they are with those who are like themselves in ability.
- Special needs students and the highest achieving students are placed with teachers who are trained for, and are interested in, meeting these special needs.
- When the highest achieving students are removed from classrooms it allows other able students to emerge.
- Heterogeneous grouping is maintained while there is a deliberate reduction in the range of achievement levels that a teacher is required to teach. Cluster grouping provides flexibility in grouping, as recommended by Renzulli (1994).
- The most efficient use of a special education is achieved by creating clusters of students in a few separate rooms.
- A high achieving group of students exists in every teacher’s classroom. Similar to the benefits of pull-out programmes on the remaining students, average and lower-ability students are clustered together with their intellectual peers and are provided with a more tailor-made educational programme.
High expectations of all students are maintained across classrooms. Smith (1980) found evidence to suggest that teacher expectations are linked with student learning, attitudes and achievement.

**Mentorship**

Research on mentoring of gifted and talented students is minimal, with the literature tending to consist of descriptions of programmes and examples of successful professionals who have discussed the significance of a mentor in their own lives. The review has failed to identify a precise definition of mentorship, and hence there is some confusion as to what provision is being evaluated. Schatz (1999) proposed a definition that “mentorship is a vehicle by which students who are bored with or tuned out of the school environment can be “caught” in the act of living a true passion and practising a related talent” (p. 74). Two review papers in the 1980s documented the then emerging field of mentorship. Frey and Holler (1983) concluded that whether the mentorship was formal or informal, the success of the provision largely depended on both the characteristics of the mentor, and the requirements and ideas of the student. They concluded that of high achieving professionals, almost all had a mentor along the course of their career, and this provision was judged to be highly successful.

Edlind and Haensly (1985) suggested that students may benefit from mentorships by advancing their career and interest, increasing their knowledge and skills, developing peripheral talents and an awareness of how to combine these talents in a productive way, enhancing self-esteem and self-confidence, developing a personal ethic or set of standards, establishing a special kind of friendship, and enhancing creativity. Edlind and Haensly also considered potential benefits of mentorship to the mentor, stating competition of work, stimulation of ideas, rejuvenation of the mentor, establishment of friendship, and personal satisfaction as benefits.

Kaufmann, Harrel, Milam, Woolvertoon, & Miller (1986) and more recently, Kaufmann (1999) examined the availability of mentors and figures of guidance. They found that women who were linked to mentors in the field achieved occupational status and salaries similar to those of the male Presidential Scholars in adult life. The authors particularly highlighted both the formal and informal role of mentors in that they may be seen as role models by the student, serving to remind them of their goals and aspirations.

Toth (1999) explained these benefits by suggesting that a) mentors may have knowledge about the individual student’s interests and can put them in touch with people or resources that may be of interest to the student, b) mentors can act as a role model to the student. The student may see the mentor as an expert, or as an example of what they need to do to be an expert and c) mentors may be able to aid the high achieving student in mapping out their career or educational pathway.

In order to evaluate the effectiveness of mentorship programmes on the education of gifted and talented students, longitudinal studies need to be conducted. At the present time, the value of mentorship is difficult to establish given that the long-term effects have not been investigated. Future research should address this area of provision.
Distance learning

Distance learning can be broadly defined as a learning experience when teacher and learner are separated by distance, including correspondence courses (Keegan, 1988), or narrowly to encompass non-contiguous communication between teacher and learner using technology to mediate communication (Garrison & Shale, 1987). Threlkeld (1991) suggested that for many gifted students, there are insufficient numbers to justify the school hiring a specialist teacher, or the education authority has inadequate funding to provide courses beyond the basic requirements. Washington (1997) viewed distance learning as a “vehicle to differentiate a curriculum which falls short in providing courses which are needed by an exceptional group of students” (p. 21). Furthermore, distance learning provision provides the opportunity for students to take more advanced courses than their school environment can provide.

Only a few studies have investigated the advantages and disadvantages of distance learning opportunities. The studies that have been conducted indicate both positive and negative aspects of such programmes. The primary benefit of distance learning is a small population of students may be accessed over a wide area (Adams & Cross, 1999). Further benefits include, being able to work independently on projects (Goodrich, 1994), students feel that they are part of a larger academic group (Goodrich, 1994), and the opportunity to take part in virtual field trips (Van Horn, 1998).

Part 3: Approaches to gifted and talented provision

Special vs. inclusive provision

Several arguments have been presented within the literature that both support and reject the notion of inclusive education for gifted and talented students. Stainback and Stainback (1990) define an inclusive school as one which:

“educates all students in the mainstream … providing [them with] appropriate educational programs that are challenging yet geared to their capabilities and needs as well as any support and assistance they and/or their teachers need to be successful in the mainstream. But an inclusive school also goes beyond this. An inclusive school is a place where everyone belongs, is accepted, supports, and is supported by his or her peers and other members of the community in the course of having his or her educational needs met” (p. 3).

The definition emphasises the importance of both student and teacher support. A system of education which is inclusive of highly able students, or other student populations with special education needs, relies heavily on implementing a multilevel, multi-modal curriculum that can meet the needs of a heterogeneous classroom (Sapon-Shevin, 1996). Furthermore, as this review has shown, teaching strategies that cater for gifted students within the regular classroom are often advantageous as this is where students tend to spend the majority of their school time.

Advocates of specialised gifted education often refer to the rigid and regular classroom as a reason for removing and educating gifted students separately. Feldhusen and Wtman (1980) stated that gifted students need:
"a maximum level of achievement in basic skills and concepts, learning activities at an appropriate level and pace, experience in creative thinking and problem solving, convergent thinking skills, self-awareness, exposure to a variety of fields, and the development of independence, self-direction and discipline in learning" (p.15-21).

It would be difficult to argue that only gifted students require this level of tuition and skill acquisition. As Shapon-Shevin (1996) argued, strategies discussed for gifted education, such as differentiation, enrichment, acceleration, and curriculum compacting, should be provided for all students within a regular classroom.

**National initiatives in gifted and talented provision**

*The National Academy for Gifted and Talented Youth*

The National Academy for Gifted and Talented Youth has been established by the government to develop, implement, promote and support educational opportunities for gifted and talented children and young people aged up to 19, as well as providing support for parents and educators. It provides a nationally and internationally recognised centre of expertise from which to develop and help improve the delivery of gifted and talented education in England. The Student Academy works with a sub-set of the top 5% of students to examine ways to provide an optimum level of provision for gifted and talented students. The Professional Academy leads, supports, and informs teachers and educators how to improve existing provision for gifted and talented students. The Expertise Centre aims to increase knowledge and understanding on how best to educate gifted and talented young people.

*London Gifted and Talented*

London Gifted and Talented is part of London Challenge, a government initiative to raise aspirations and standards in education. London Gifted and Talented aims to combat disadvantage and realise the gifts and talents of London’s young people. Furthermore, it offers opportunities for talented people to work together to improve provisions for gifted and talented students, teachers and parents.

*World Class Arena*

World Class Arena is an international initiative designed to identify and assess gifted and talented students around the world. It has been developed by the Department for Education and Skills (DfES). World Class Arena has a focus on mathematical and problem solving skills, particularly around the upper primary and lower secondary school pupil’s age.

**Part 4: Issues in the effective education of gifted and talented students**

**Conclusions**

There are relatively few methodologically rigorous studies into effective pedagogy within gifted and talented education. The body of research does have a tendency to report case study examples of good practice, reflecting practitioners’ own experiences. Consequently reports of evidence-based practice and policy tend to be scarce (see Ziegler & Raul, 2000). Ziegler and Raul (2000) highlighted a further problem that has been observed within this review. Their meta-analysis of the field found that methodological standards were, on the whole, poor, with few empirical
studies utilising control groups. The empirical research is also characterised by the use of small sample sizes, and often utilising students selected from small localised gifted programmes.

Specifically concerning the identification of gifted students, there is little research to clarify the relative advantages and disadvantages of various identification methods. There is a general consensus among the literature that identification should adopt a multi-method approach, but, it appears to be a consensus that is supported by limited evidence. It is particularly unclear how these differing methods should be drawn together, or the relative status of different methods in particular circumstances. The review of research on identification methods also highlighted concern over definitions and characteristics of highly able pupils, particularly across differing student age groups and subject areas. There appeared to be some confusion about what abilities a gifted or talented pupil should possess, and therefore this has tended to influence the choice of identification method discussed.

The research on both differentiation and enrichment suggests that these methods may provide the most effective strategies for educating gifted and talented students. Despite this, there are a very limited number of studies that have rigorously investigated such methods. This may, in part, be due to two reasons. First, there is a wide and diverse range of enrichment and differentiation programmes open to educators, resulting in a systematic approach to investigation being difficult. Second, there are very few criteria to evaluate the effectiveness of such enrichment programmes alongside the ordinary curriculum. Research studies have evaluated achievement levels, teacher and student evaluations of provision, and hence it is often difficult to compare and draw conclusions on the relative benefits of different approaches.

The use of acceleration strategies in gifted and talented education appears to be one of the more comprehensive areas of research. However, it appears common for researchers to overgeneralise their findings. Like enrichment activities, there is a wide and diverse range of acceleration practices that may be employed. On the whole, researchers do not tend to fully document the type of acceleration programme they are investigating, suggesting that accelerated programmes may be beneficial, when in fact only advanced classes are beneficial. As Ziegler and Raul (2000) also stated, investigations into accelerated practices tend to be conducted by the creators of the programme. As a result there is the possibility of some bias in their reporting of findings, and students taking part in the study may be highly selected for the programme. In addition to this, student evaluations of accelerated programmes may predominantly come from successful students, with students who have dropped out of the accelerated programme being excluded. These two factors may heavily bias results and findings.

While the extant literature does present a wealth of studies which discuss practices of identification and education, there is a current lack of connection made between pedagogy, teaching and learning. Literature within the field of special educational needs discusses school effectiveness in much more depth. However, such enquiry in gifted and talented education is more minimal. Future research into high-ability should address this issue, and provide a greater insight into the relationship between educational practices with gifted students and the whole school environment and ethos.

There is a lack of sustained interest in examining the identification and education of gifted and talented students within culturally diverse and minority ethnic groups. The extant literature does highlight the need to consider the diverse needs of
students in the selection of identification methods, particularly among pupils who do not speak English as their first language. A few, rather limited studies, have also discussed the proportionate number of students from culturally diverse backgrounds within ability grouping practices. However, this enquiry has been unsystematic and should be addressed with robust methodologies in the future.
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Appendix A

Literature Review Template:

Baseline Review of the Literature on Effective Pedagogies for Gifted and Talented Students

Details of Publication:
Author(s):
Title:
Journal:
Year/Volume/issue Number/Pages:
Publisher/Location:
Country of origin:
Institutional Affiliation:
Holdings:
Impact factor:

State target population (ie., age, area of giftedness)

Key themes:

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<th>Differentiation</th>
<th>Enrichment</th>
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<td>Special provision</td>
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Curriculum Models (specify) _______________________

Research-based (complete section 1)

Theory-based (complete section 2)

References to follow-up added to excel database

Section 1: Research-based references

Research questions / aims:

Research design / methodology:

Measures of student outcome used:

Findings:

Conclusions:

Recommendations for effective identification and provision (both stated and inferred):
Section 2: Theory-based references

Main focus:

Approaches to identification and provision:

Outcomes:

Recommendations for effective identification and provision (both stated and inferred):

References to follow-up:
Appendix B

Key research papers to guide policy and practice

The following research papers and reports are frequently cited as both methodologically robust and as providing an evidence base for improving policy and practice in gifted education.


