

Pedagogical Approaches for Meeting Gifted Students' Needs: Literature Review

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ABSTRACT

In recent decades, there has been significant interest internationally level in the field of gifted education, which has led to a vast amount of research. This widespread interest stems from recognising what might be seen as the intrinsic value of developing giftedness. Nurturing gifted students has become an essential part of the mainstream educational system of developed countries. Furthermore, more countries around the world are now becoming aware of the potential benefits of investing in gifted education and the role that such investment can play in their growth and development. However, many gifted students may not receive educational opportunities that match their abilities and needs as instruction in regular classroom settings is usually not tailored to meet the needs of more gifted learners. Much research has shown that gifted children need tailored educational opportunities for their talents to flourish and to stimulate their individual potential in appropriate environments. This paper reviews and analyses the relevant literature on the pedagogical approaches to meeting gifted students' needs. The four main approaches to meeting diverse students' needs, comprising acceleration, grouping, enrichment and differentiation, are discussed to explore and understand how to provide adequate support for gifted students.

Keyword: Acceleration, Grouping, Enrichment and Differentiation, gifted students

INTRODUCTION

In recent years the increasing amount of research in the gifted field has generated a better understanding of the needs of gifted students and the need to implement special educational measures for gifted students is now largely acknowledged worldwide (Colangelo & Wood, 2015; Harris et al., 2009; Margot, 2020; Sękowski & Łubianka, 2015). Meeting the needs of a diverse group of learners has always been of concern to teachers. However, the pace of change and diversity in society has raised the level of this concern (Morgan, 2014). With pressures on funding, schools may often choose a single approach when "an array of services would provide better matches between students and instruction" (Callahan & Hertberg-Davis, 2013, p. 1). Today's students also have different learning needs and preferences to previous generations, most notably in using technology, where traditional pedagogy can be frustrating for students who are used to highly personalised digital experiences (Herther, 2009) and can more easily access knowledge for themselves. Similarly, changes in society mean that a wider than ever before range of learners are now typically in the same classrooms (Morgan, 2014). So, despite general recognition of the importance of gifted education, "general education is not yet ready to meet the needs of gifted students" (Callahan & Hertberg-Davis, 2013, p. 9).

Thus, it is more important than ever to consider a wide range of instructional choices to best support a diverse range of gifted learner needs. In the next section, I will discuss the main approaches to supporting gifted students identified within gifted education literature – enrichment, differentiation, acceleration, and grouping.

RESEARCH OBJECTIVE

To discuss the main pedagogical approaches addressing gifted students' needs drawing on the gifted education literature.

Enrichment

Enrichment programmes are used when the general curriculum cannot give gifted students what they need or is unable to challenge their abilities. There are varied forms of enrichment that can provide care for gifted pupils such as pull-out programmes, special classes, learning resource rooms, summer enrichment programmes, weekend programmes, and evening programmes (Davis et al., 2011; Robins & Jolly, 2020). Enrichment started around 100 years ago as an alternative to acceleration, which was not seen as meeting “the emotional and social needs of gifted youngsters” (Colangelo & Davis, 2002, p. 274). One of the earliest examples of enrichment was in New York City in 1916, where Leta Stetter Hollingworth set up enriched classes for students aged seven to nine (Gray & Hollingworth, 1931). Her students spent around half their time on enrichment activities such as French and music, as well as “a good deal of extra work in science and mathematics” (Colangelo & Davis, 2002, p. 274).

Nowadays, enrichment programmes have become “the most prominent kind of school programmes in the education of gifted students” (Aljughaiman and Ayoub, 2013, p.101). Enrichment is used not just for academic progress but recognises that gifted children have different socioemotional needs (Kulik, 1992). Enriched curriculums better meet the needs of gifted students so that they exercise multiple skills and thinking strategies, including more in-depth thinking and application of knowledge (Jarwan, 2013). In contrast, a standard curriculum might not meet the needs of gifted students, meaning that they fail to make enough progress or feel bored at school. Indeed, it has even been suggested that as many as 20% of students dropping out of school are gifted (Matthews, 2006; Renzulli & Park, 2000) and that gifted student could be bored as they spend 50% of their time in school “without any benefit” (Bakhit, 2007, p. 686). These findings highlight the risk of not challenging students enough. Enrichment is distinct from acceleration in that it focuses upon enhancing the depth of a student’s learning rather than on making them work at a more rapid pace. As such, enrichment allows students to continue working with peers of the same age yet whilst also having access to more advanced and challenging educational opportunities in order to develop their talents (Coleman & Cross, 2005).

Enrichment refers to “richer, more varied educational experiences” (Colangelo & Davis, 2002, p. 164). This can be through the curriculum itself or how programmes are delivered. Enrichment may therefore be categorised as process-based, content-based, or product-based (Howley et al., 1986). Process-based enrichment means changing teaching approaches for gifted children to make them more challenging, such as by using Bloom’s Taxonomy to teach higher-order thinking skills (Anderson et al., 2001) rather than using traditional pedagogy. For example, a class studying how to calculate the area of rectangles could follow a step-by-step approach of multiplying the longest and shortest side following a teacher’s example. This would

be at the bottom of Bloom's taxonomy because students are just repeating and reproducing the method provided as an example. Instead, gifted children could be facilitated to explore the calculation of area using Lego blocks or by dividing rectangles into squares in order to deduce the area, meeting the 'analysis' level of Bloom's taxonomy because they are analysing, comparing, and diagramming.

Alternatively, content-based approaches use more in-depth learning topics rather than changing how those topics are taught. At primary school, this could be "a mini course in pre-algebra" or other "content-acceleration methods" (Colangelo & Davis, 2002, p. 164). Using the same area of a rectangle example above, content-based enrichment might give gifted students more challenging shapes to work with, such as polygons. This would mean that students would be working at the same time on developing multiple forms of knowledge by being confronted with more challenging learning material. Finally, product-based approaches involve students producing something different, for example developing new skills or creating tangible products "such as a report, painting, novel or presentation" (Colangelo & Davis, 2002, p. 165). Gifted students in physics might therefore produce a poster to explain how circuits work as well as making a physical example of a circuit.

More recent models of enrichment combine these three approaches, based on the idea that "adopting approaches in which the three dimensions of content, process, and product are integrated, or making a conscious effort to combine methods from the three orientations, will better address the needs of gifted students through comprehensive enrichment" (Colangelo & Davis, 2002). Renzulli's model (shown below) is a good example of this integration, showing how enrichment can work across a school community (Renzulli & Renzulli, 2010).

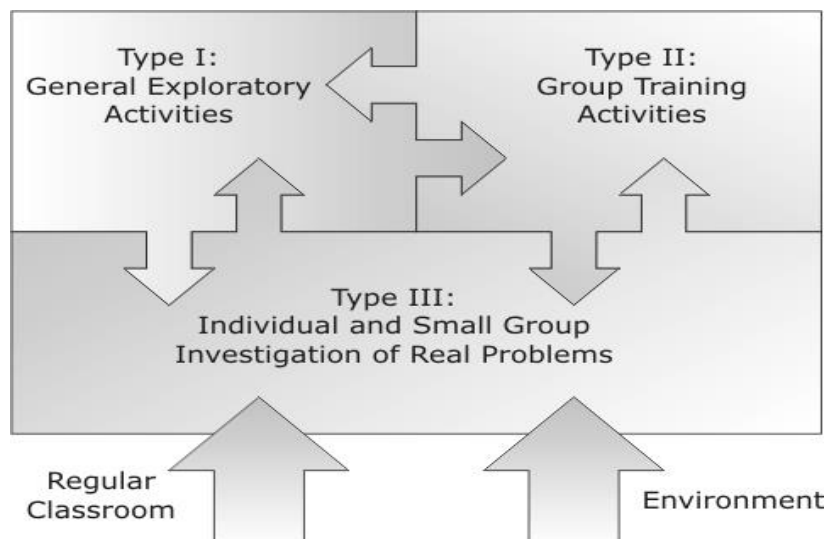


Figure Error! No text of specified style in document.-1:The Enrichment Triad Model (Renzulli, 1977)

As the diagram shows, Renzulli's model consists of three interconnected 'types' of enrichment. Type 1 enrichment helps students to explore a topic to build their interest. These are normally extra-curricular activities where gifted learners can research around their own areas of interest. This is then supported by Type 2 enrichment, where teachers help students to develop

the skills, they need to explore these areas of interest further. This can include developing cognitive abilities, emotional intelligence, or library research skills. These skills prepare students for type 3 enrichment, where they make a product about their topic for a specified audience such as for other students or as part of an exhibition. This enables gifted students to plan their own programmes in an integrated manner (Subotnik et al., 2009).

Students can learn at different paces and not all students are “interested in pursuing the same topics in greater depth and at high levels of complexity” (Davis et al., 2011, p. 145). Nonetheless it may be seen that “there are some enrichment activities that are good for all students”, whether they display gifted traits or not. For example, all students can benefit from “creativity and thinking skills training” (Davis et al., 2011, p. 146). In contrast, some other types of enrichment activities such as working independently on complex projects may be seen to be more helpful for gifted students. Indeed, it has been found that gifted students may make around 4 months of extra progress per year in enriched classes than non-gifted students in the same enriched class (Colangelo & Davis, 2002; Kulik, 1992; Swastika et al., 2019). This suggests that identification of gifted students is important for the efficiency of enrichment programmes. As (Callahan and Hertberg-Davis, 2013) point out, programmes “rarely articulate a complete programming diet adequate for meeting the academic and affective needs of a broad range of gifted students, but rather need to be combined in thoughtful ways into a spectrum of services” (Callahan and Hertberg-Davis, 2013, p. 161). Hence, it is important to choose different strategies for meeting the needs of gifted students so that identification can support selection of the most suitable strategies for specific learner traits. As (Burney, 2008) argues, identification is important to help tailor enriched programmes to accommodate “the unique traits of gifted students” (Young & Balli, 2014, p. 237).

DIFFERENTIATION

Differentiation may be defined, following (Tomlinson et al., 2003), as “an approach to teaching in which teachers proactively modify curricula, teaching methods, resources, learning activities, and student products to address the diverse needs of individual students and small groups of students to maximize the learning opportunity for each student in a classroom.” (Tomlinson et al., 2003, p. 121).

Differentiation sees learners as having differences “within each concept taught” (Dixon et al., 2014, p. 113) based on a learner's readiness, interest, and learning profile (Tomlinson & Jarvis, 2009). This means that, whilst students may be working towards similar goals, at the same time they are likely to have different access points and levels of support. (Moon, 2005) explains that a “key principle of differentiation is that all students are moving toward the same instructional objectives” alongside a recognition that some “will move at a quicker pace or with greater independence” (Moon, 2005, p. 231). Differentiation therefore may use different strategies and learning materials with different students depending on their individual needs and abilities, but at the same time the concepts being taught in these differentiated ways and the learning goals for students, such as understanding a certain topic, will often be similar. Differentiation varies based on “the way content is presented (the content dimension of differentiation), the way content is learned (the process dimension), and the ways students respond to the content (the product dimension)” (Dixon et al., 2014, p. 113).

Differentiation adapts strategies for each teaching and learning situation. As such, teachers must "use a variety of different grouping options for different purposes" (Davis et al., 2011, p. 154) because students are seen as gifted in specific situations rather than simply being gifted in general. This means that differentiation reflects an underlying assumption that giftedness will vary depending on students' abilities in particular areas, so labelling a child as gifted in general may be an overgeneralisation. Similarly, differentiation has been linked to the belief that "mixed ability, heterogeneous" classrooms are intrinsically positive because they support egalitarian values (George, 2005, p. 186), emphasising an equality of educational opportunities that may allow for the different needs of a diversity of pupils to be met in the same classroom. This is connected to the belief that the needs of gifted children do not just concern academic challenges but could include other considerations such as being in a group of same-age peers. A differentiated approach to teaching as such may be seen to contrast with other approaches that presume that the diversity of pupils with different abilities across different domains in a single classroom may benefit from a standardised curriculum (Hertberg-Davis, 2009).

However, differentiation can be challenging because providing such an approach for gifted students requires educators who are "knowledgeable and informed about this population of students, and instructional practices that promote differentiation" (Finley, 2008, p. 80). It requires teachers to understand what characteristics of a task make it more or less difficult for certain learners, as well as more general skills of flexibility, time, skill, and patience from teachers and puts pressure on their workload (Dixon et al., 2014). As a result, "although teachers recognize the need to differentiate, they believe that it is difficult and time consuming while they often admit that they really don't know how to translate the theory of differentiation into practice" (Valiandes & Neophytou, 2018, p. 123). Unfortunately, such teaching skills may be rare (Olenchak, 2001). One response is to improve teacher training to produce more highly skilled teachers (Laine & Tirri, 2016). This means that, whilst the approach of differentiation may be very appealing in theory, there may be more pragmatic approaches better suited to meeting the needs of gifted learners.

If the educational circumstances and infrastructure facilitate applying a practice of differentiation, such as having a sufficient number of sufficiently qualified teachers who are given sufficient freedom to adjust the curriculum to apply this strategy within small class sizes, then differentiation might function well. However, this will not be the case in other contexts without such resources or opportunities. For example, Finland encourages decentralisation in the educational system and provides space to highly trained teachers to practice differentiation in their classrooms, but this same approach would be more difficult to employ currently in Saudi Arabia where the education system is centralised and individual teachers receive less advanced training, are given less autonomy, and often must work with overcrowded classes (Alamer, 2014). Indeed, despite a growing amount of research (Aljughaiman & Grigorenko, 2013; Faisal & Ghani, 2015) suggesting that a differentiation approach to meet the needs of gifted students could be helpfully employed in Saudi Arabia, (Aichouni et al., 2015) have highlighted that gifted student are still generally forced to study in a regular curriculum in Saudi Arabia as a result of the centralised system managed by the Saudi Ministry of Education. However, if more advanced professional development opportunities were available to teachers in Saudi Arabia and they were given more time for planning differentiated lessons, perhaps their ability to apply a differentiated approach would be greater. This corresponds with Robinson's (2008) research in the different context of the USA that suggests that receiving

gifted education training has improved teachers' abilities to mould their teaching to the different needs of gifted students in their classrooms.

ACCELERATION

Acceleration means progression through a programme at a faster pace than would normally be expected for a student's age or entering a programme earlier than expected. For instance, skipping ahead a year or starting school at a younger age can both be considered acceleration. In the latter case even if starting school early does not shorten the total number of years a child spends in school this may still be considered acceleration. This approach enables gifted students to "progress through an educational program at rates faster or at ages younger than conventional" (Pressey, 1949, p. 2). However, acceleration remains one of "the most controversial practices in education" (Kanevsky, 2011, p. 156).

Skipping ahead a year or starting school early may be referred to as "service delivery" acceleration in which "a student enters a higher-grade level" (Colangelo & Davis, 2002, p. 165), but only receives the standard curriculum offered to other students in that higher level. Alternatively, "acceleration as a curriculum model" emphasises the pace at which a student progresses through the curriculum and could be delivered as self-directed study within a student's regular classroom or in "a resource room, or in special classes" (Colangelo & Davis, 2002, p. 165). For Colangelo and Davis (2002), this is different from enrichment because the student masters the standard content at a quicker pace – enrichment would seek to expand the content or present more challenges without moving ahead to a new topic.

In addition to the two broad categories of acceleration in terms of service delivery or as a curriculum model, there are several subtypes which have distinct approaches. This is important because some approaches avoid moving students out of their peer group or do so only on a part-time basis, which can mitigate many of the common concerns teachers have about acceleration (Rambo & McCoach, 2012). The different types of acceleration also help to overcome limitations in how gifted children are assessed and identified. Using a single high-stakes test or a combined score with a cut-off for whether a student is gifted might mean that some high-ability students might miss out on an accelerated education as a result of not obtaining a qualifying composite score. Therefore, students "with an uneven profile of achievement scores (significantly advanced in one area but not others) are not likely to obtain a qualifying score but may be served well by content acceleration in their area(s) of strength" (Colangelo et al., 2010, p. 183). This suggests that acceleration in a single subject area could be a useful strategy for meeting the needs of students with multiple intelligences (Karolyi et al., 2003).

Content-based acceleration is sub-divided into "single-subject acceleration, curriculum compacting, dual enrolment, credit by examination or prior experience, Advanced Placement and International Baccalaureate programs, and talent search programs" (Colangelo et al., 2010, p. 184). In single-subject acceleration, students stay in their regular classroom for the majority of their time but go study with another, higher grade for some subjects. This can involve the student physically moving rooms within the school, occasionally going to study at another school, or a teacher coming from another school to create a new class, although this last example is arguably very similar to enrichment since the gifted students are not joining a pre-existing class. There is also some overlap with dual enrolment where students can take higher-level courses at other schools or universities, the difference being that dual enrolment first

requires students to evidence proficiency at lower grades while single-subject acceleration can leave potential knowledge gaps. Similarly, curriculum compacting allows students to use time saved from working more quickly than their peers to focus on their own interests (Colangelo et al., 2010). Curriculum compacting may be defined as the elimination of any curricular material already mastered by students and replacing this material with new subjects and activities that aim to be more relevant to advanced learners (Reis et al., 2004). This typically means a gifted student staying in their regular classroom but engaging in advanced content and skills development within their 'compacted' curriculum.

Another content-based acceleration approach to the problem of knowledge gaps is to use credit by examination or prior experience, where students who are able to show ability in the subject are allowed to skip over introductory or consolidation materials. While their peers are practicing and reinforcing skills, accelerated students can move on to more advanced coursework having already demonstrated that they do not need such practice (Colangelo et al., 2010). Similarly, in some places older students can link advanced coursework to specific advanced programmes which may link to their future university study. For example, in the USA, the Advanced Placement (AP) programme allows this (Colangelo et al., 2010). However, this type of acceleration making the transition from school to university faster is not applied in some education systems.

As an alternative or complement to content-based acceleration, grade-based acceleration is distinct because it shortens the time a student spends in the compulsory school system or, in the case of early entry, shortens the waiting time before starting school (Colangelo et al., 2010). This category of acceleration is also different because it is on a full-time rather than part-time or temporary basis – a student on a grade-based accelerated programme effectively becomes a member of that higher grade. Varieties can be further subdivided into early entrance to school, whole-grade acceleration or grade skipping, grade telescoping, and early entrance to university (Kanevsky, 2011).

Early entry to school can involve entering kindergarten or nursery at a younger age or skipping this first introduction and going straight into year one or, in very rare cases, even higher. Early entry can help overcome problems with arbitrary cut-offs based on birthdays, so flexible start dates for nursery or kindergarten can be a relatively uncontroversial form of acceleration based on a student's social maturity and reading age (Colangelo et al., 2010). Once students are in the school system, they might then skip mid-way through the year to the next grade and then stay in that new grade going forward. Alternatively, they may end the school year with their current grade but then skip over the next grade at the start of the next academic year. Again, they would leave their former classmates behind and join a new grade, this time a full year ahead.

An alternative to an individual skipping grades alone is to bring together a group of peers suitable for acceleration into a brand-new class which seeks to move through the full curriculum, skipping nothing but still completing the programme and leaving the school early (Barnett, 2011). All of these acceleration approaches can also be supported by early entry to university, where students achieve graduation or exam results earlier than typical or can otherwise demonstrate their aptitude for university. As with other grade-based acceleration approaches, the student leaves their school and becomes a full-time student at the university (Heinbokel, 2010).

It is argued that there is now over 50 years of research evidence that has "demonstrated the academic progress of accelerated students" (Siegle et al., 2013, p. 29), including gifted students surpassing their new classmates and having more positive attitudes to school than gifted students who are kept with same-age peers. However, some researchers also note that "concerns about accelerative practices persist" (Davis et al., 2013, p. 29) among many teachers who may focus too much on the potential negatives rather than benefits of acceleration, especially regarding students' social and emotional development. (Borland, 1999) describes this as the "gulf between what research has revealed and what most practitioners believe" (Borland, 1999, p. 185). A survey of teachers' attitudes in the USA found that "teachers' opinions of acceleration are not always based on research", and that common objections to acceleration were preventing gifted students from being recommended for acceleration programmes (Rambo & McCoach, 2012, p. 149). The numerous objections leading to a lower likelihood of recommending gifted children for acceleration documented by this study included beliefs that being educated with older students is harmful to the social-emotional development and wellbeing of a student and that grade-skipping can lead to serious anxiety, academic burnout, and gaps in knowledge (Ibid., 2012, p. 246). Concerns about social and emotional experiences are dominant. Rambo and McCoach argue that the upset and frustration of not being accelerated often outweighs such risks, but it would seem from their study that teachers are far more conservative or not convinced.

Tomlinson makes a powerful argument against academic objections or concerns about knowledge gaps, arguing that acceleration is not about moving students too quickly but rather "for very bright students, that pace is not an accelerated one. To the contrary, it is the comfortable pace of learning for those particular students" (Tomlinson, 2005, p. 163). From the perspective of a gifted student, it might therefore not be that an accelerated programme feels fast but that their regular classes feel too slow. This idea can be seen in definitions of acceleration, such as the National Association for Gifted Children defining it as "allowing a student to move through traditional educational organisations more rapidly" (National Association for Gifted Children, 2004, p. 1). The emphasis within this definition on 'allowing' suggests that gifted students want to be allowed to progress at an accelerated pace, implying that non-accelerated programmes do not allow for optimal pacing for gifted students.

Indeed, research has consistently shown how acceleration may have positive effects on students (Assouline et al., 2018; Kanlı, 2020; Ma, 2002; Sheppard, 2018). Within this body of scholarship, students who skip a grade have often been found to outperform older peers in terms of educational achievements whilst displaying similar emotional and social development (Colangelo et al., 2010; Kulik, 2004; Steenbergen-Hu & Moon, 2011). Some researchers have even suggested that if a gifted student is not able to be accelerated then this may result in academic underachievement and social and emotional problems (Feldhusen, 2003; Hoogeveen et al., 2012; Robinson, 2004). In response to the concerns raised by some research surrounding potential feelings of inferiority amongst students accelerated to work amongst older peers due to, for example, their smaller physical size (Dare et al., 2016) other researchers have responded with acknowledgment of the fact that each individual student's ability to cope with change and adjust and their general maturity and social skills is different, and as such considerations of the emotional impacts of grade-acceleration could usefully be assessed individually (Kretschmann et al., 2019).

GROUPING

According to (Gray et al., 2009; Kulik & Kulik, 1992), ability grouping may be defined as placing students together for instruction according to their shared ability levels. Multiple investigations have focused on the grouping of gifted children, producing evidence that suggests that in some contexts gifted students may learn more quickly and efficiently when grouped together and educated using materials that are designed for their particular ability level (Cathcart, 2005; Margot, 2020).

Rogers has been an advocate of ability grouping as a strategy to more effectively support gifted students, stating that "[g]ifted learners need some form of grouping by ability to effectively and efficiently accomplish several educational goals, including appropriately broadened, extended, and accelerated curricula" (Rogers, 2018, p. 99). (Rogers, 2002) has also put forward that, although there are many different ways in which ability grouping may be pursued, all such methods can be divided into two major types. These two primary types of grouping are heterogeneous grouping - which involves the placement of students with various levels of ability within the same classrooms - and homogeneous grouping - which involves the placement of students of similar abilities into one classroom. Homogeneous grouping may be achieved using multiple methods such as pull-out classes, special classes, special schools for gifted students, and cluster grouping, as shall be further explored below.

The main purpose of homogeneous ability grouping may be seen as "to create a more homogeneous learning environment so that teachers can provide instruction better matched to students' needs and so that students can benefit from interactions with their comparable academic peers" (Steenbergen-Hu et al., 2016, p. 851). Homogeneous ability grouping has been argued by many scholars to be beneficial for gifted students since it allows teachers to design classes specifically with gifted pupils' needs in mind and thus present gifted learners with greater challenges that are more likely to facilitate them in developing their advanced skills further (Adams-Byers et al., 2004; Chessor & Whitton, 2007; Fuchs et al., 1998; Gross, 1997; Kulik, 1992; Rakow, 2020; Rogers, 1998, 2018). Creating such a stimulating environment with enriched materials for gifted students is seen here to be much harder in mixed-ability settings, where many educators are forced to design their classes with a perceived 'middle-ground' pupil in mind (Brulles et al., 2010). In contrast, in homogeneous groups gifted pupils may have more opportunities to learn alongside other more 'intellectual' students, not only being more able to engage at a stimulating level but also perhaps coming to see their own abilities more realistically than if they simply felt themselves to always be the most able student in their class (Fiedler et al., 2002). In addition, (Preckel, Götz and Frenzel, 2010, Adodo and Agbayewa, 2011) argue that by creating a more challenging educational environment, homogeneous ability grouping can decrease boredom and increase motivation and academic growth for gifted students.

However, critics of homogeneous ability grouping have claimed that separating students according to their ability levels may contribute to achievement gaps as a result of the stratification of instructional opportunities which potentially cause detrimental psychosocial outcomes for some students. For example, being placed in a lower ability group might lead some pupils to experience lower self-esteem, whilst being placed in a gifted group can also bring its own forms of stigma (Hallam & Ireson, 2005; Oakes, 2008; Belfi et al., 2012). In order to avoid such stigmas (Poole, 2008) and to facilitate gifted students in navigating interactions with a

diversity of peers and the development of both leadership and cooperation skills, some scholars rather advocate heterogeneous grouping (Alice, 2019; Balestra et al., 2021; Ballantine & Mccourt Larres, 2007; Heltemes, 2009; Poole, 2008; Saleh et al., 2005; Tieso, 2005). (Townes, Kreke and Fields, 2000), for example, have argued that heterogeneous grouping allows for a broader social experience within school, involving more opportunities to socialise and facilitating the greater development of more accepting and respectful relationships with a diversity of peers. They see this as potentially creating a greater sense of community within the classroom that is conducive to greater student motivation and as such to greater achievements by students of all ability levels. This has been further explored by numerous studies that have found teachers to often report concerns about homogeneous grouping, seeing it as 'elitist', causing gifted children to have "an inflated opinion of themselves" (Gallagher et al., 2011, p. 12), and depriving other students within a regular classroom of the potential positive influence of more gifted role models (Bain et al., 2007; Gross, 2006; Milton & Lewis, 2005; Rakow, 2020). However, despite such commonly perceived potential benefits to gifted learners and their peers, heterogeneous grouping has also been criticised since other studies have indicated that high-ability students may progress slower and show reduced motivation as a result of interacting with lower ability students (Heltemes, 2009; Poole, 2008; Rogers, 1998; Saleh et al., 2005).

A pull-out class may be defined as "one in which identified gifted students leave their classroom for a specified period of time to attend a class designed to meet their special needs" (Moon et al., 1994, p. 38). In this scenario, gifted students remain within mixed ability classes for the majority of their education, yet are 'pulled out' from these classes for some sessions concerning certain topics with similarly gifted peers. In another approach, gifted students may be grouped into special classes within their regular school based on their abilities. In this circumstance, unlike with pull-out classes, gifted students stay in such classes all day throughout the year. This provides gifted students with the opportunity to benefit from specialised attention whilst maintaining contact with the larger school community (Davis et al., 2011). Going a step further, special schools are perhaps the most extreme form of homogeneous ability grouping. Taking this approach, students identified as gifted are separated entirely from other students and sent to a different school that is designed specifically to cater to the needs of more gifted students (Jarwan, 2013). Access to advanced equipment, more highly qualified teachers and technicians, and uniquely designed assessment systems are often elements of such 'special schools' in order to make them more stimulating environments for gifted learners.

Finally, cluster grouping is a type of within-class grouping wherein students identified as gifted are educated within the same classrooms as other students of all abilities yet are grouped together within that mixed classroom setting, for example by being sat together around the same table (Neihart, 2007). This homogeneous grouping approach as such is more subtle than the others and attempts to minimise the potential risks of more demarcated separation of gifted students, such as stigma or increased pressure, whilst maintaining some of the benefits of more heterogeneous grouping such as the development of greater leadership skills and facilitation of certain aspects of learning through interactions with a greater diversity of peers working at different levels (Steenbergen-Hu et al., 2016). Meanwhile, the major variety of heterogeneous grouping is cooperative learning. The essence of this approach is that gifted students are educated with peers of mixed abilities within the same classroom wherein students of all abilities work together to maximise their own and each other's learning (Johnson et al., 2014).

As (Slavin, 1993) has put it:

"In essence, the argument in favour of ability grouping is that it will allow teachers to adapt instruction to the needs of a diverse student body and give them an opportunity to provide more difficult material to high achievers and more support to low achievers." (Slavin, 1993, p. 77).

In theory then, regardless of the specific method employed, ability grouping should enable the best support to be given not only to gifted learners but to learners across the whole spectrum of ability levels from low to high. In practice, as the debate between the advantages of homogeneous and heterogeneous grouping briefly outlined above indicates, research has shown that both gifted learners and learners displaying lower ability levels may benefit differently from both homogeneous and heterogeneous ability grouping in different contexts (Craven et al., 2000; Matthews et al., 2013; Saleh et al., 2005; Tieso, 2005). It may be seen that it is hard to generalise concerning the potential outcomes of ability grouping for gifted students. Given this lack of consensus concerning the outcomes of homogeneous and heterogeneous ability grouping, an argument could be made that teacher should be trained and enabled to use both approaches flexibly to be able to balance the potential advantages and disadvantages of both. A teacher's flexible use of both grouping strategies might enable their students to learn together whilst also being supported by customised instruction and appropriately challenging materials. This is of great importance because students of all ability levels are put at a disadvantage if their allocation in homogenous ability groups follows an inappropriate process that does not take into account a diversity of different forms of giftedness. This might indicate the importance of choosing and carefully examining the optimal approaches to maximise the potential benefits of being placed within homogenous groupings of similarly gifted peers.

CONCLUSION

This paper has explored the pedagogical approaches of differentiation, enrichment, acceleration and grouping as strategies to meet the needs of gifted students. The appropriateness of any one of these approaches in any given context depends on multiple factors, including the way in which giftedness is conceptualised and the surrounding socio-cultural, political and economic situation. For example, if a nation lacks the economic resources to apply certain approaches, such as providing more advanced training to teachers regarding differentiation strategies or a wider range of educational facilities for enrichment programmes, it will likely be difficult to apply them in that context. Likewise, if there are significant cultural barriers to a certain approach, such as egalitarian values preventing the provision of special attention to some students at the expense of others, as in the Finnish case, this may render that approach unfeasible in that context. This emphasises the importance of choosing the optimal approaches for individual learners' needs.

RECOMMENDATIONS

1. Teachers need appropriate training and professional development opportunities to develop their knowledge of pedagogical approaches that can address the needs of gifted students and provide support, such as differentiation, enrichment, acceleration, and grouping.
2. Research needs to be conducted exploring students' and teachers' perceptions of the pedagogical approaches that are used to meet the needs of gifted students.

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Reference

- Aboud, Y. Z. (2021). Evaluation of Teachers, Supervisors and Accelerated Students Concerning Academic Acceleration in Saudi Arabia. *Psychology and Education Journal*, 58(2), 8105–8119.
- Adams-Byers, J., Whitsell, S. S., & Moon, S. M. (2004). Gifted students' perceptions of the academic and social/emotional effects of homogeneous and heterogeneous grouping. *Gifted Child Quarterly*, 48(1), 7–20.
- Adodo, S. O., & Agbayewa, J. O. (2011). Effect of homogenous and heterogeneous ability grouping class teaching on students' interest, attitude and achievement in integrated science. *International Journal of Psychology and Counselling*, 3(3), 48–54.
- Aichouni, M., Touahmia, M., Al-Ghamdi, A., Ait-Messaoudene, N., Al-Hamali, R. M., Al-Ghonamy, A., & Al-Badawi, E. (2015). Creativity and innovation among gifted saudi students-an empirical study. *Procedia-Social and Behavioral Sciences*, 195, 1371–1379.
- Al Qarni, A. (2010). *Evaluation of provisions for gifted students in Saudi Arabia*. University of Wollongong.
- Alamer, S. M. (2014). Challenges facing gifted students in Saudi Arabia. *Research on Humanities and Social Sciences*, 4(24), 107–112.
- Alice, B. (2019). *Ability Practices, Self-Esteem and Academic Achievement among Secondary School Students in Iganga District*.
- Aljughaiman, A. M., & Ayoub, A. E. A. (2017). Giftedness in Arabic environments: Concepts, implicit theories, and the contributed factors in the enrichment programs. *Cogent Education*, 4(1), 1364900.
- Aljughaiman, A. M. and Ayoub, A. E. A. (2013) 'Evaluating the effects of the oasis enrichment model on gifted education: A meta-analysis study', *Journal of Talent Development and Excellence*, 5(1).
- Aljughaiman, A. M., & Grigorenko, E. L. (2013). Growing up under pressure: The cultural and religious context of the Saudi system of gifted education. *Journal for the Education of the Gifted*, 36(3), 307–322.
- Aljughaiman, A., Nofal, M., & Hein, S. (2015). Gifted education in Saudi Arabia. *Gifted Education in Asia: Problems and Prospects*, 191–211.
- Alqefari, A. (2010). *A study of programmes for gifted students in the Kingdom of Saudi Arabia*. School of Social Sciences PhD Theses.
- Anderson, L. W., Krathwohl, D. R., Airasian, P., Cruikshank, K., Mayer, R., Pintrich, P., Rath, J., & Wittrock, M. (2001). *A taxonomy for learning, teaching and assessing: A revision of Bloom's taxonomy*. Longman.
- Assouline, S. G., Lupkowski-Shoplik, A., & Colangelo, N. (2018). *Acceleration and the talent search model: Transforming the school culture*.
- Bain, S. K., Bliss, S. L., Choate, S. M., & Brown, K. S. (2007). Serving children who are gifted: Perceptions of undergraduates planning to become teachers. *Journal for the Education of the Gifted*, 30(4), 450–478.
- Bakhit, M. H. (2007). Psychological pressures of students who excel academically and normally in the first secondary grade and its relationship with some variables. *First Scientific Conference of the Department of Mental Health Faculty of Education*, 673–747.

Balestra, S., Sallin, A., & Wolter, S. C. (2021). High-ability influencers? The heterogeneous effects of gifted classmates. *Journal of Human Resources*, 0920-11170R1.

Ballantine, J., & Mccourt Larres, P. (2007). Final year accounting undergraduates' attitudes to group assessment and the role of learning logs. *Accounting Education: An International Journal*, 16(2), 163–183.

Barnett, W. S. (2011). Effectiveness of early educational intervention. *Science*, 333(6045), 975–978.

Belfi, B., Goos, M., De Fraine, B., & Van Damme, J. (2012). The effect of class composition by gender and ability on secondary school students' school well-being and academic self-concept: A literature review. *Educational Research Review*, 7(1), 62–74.

Borland, J. H. (1999). The Limits of Consilience: A Reaction to François Gagné's "My Convictions about the Nature of Abilities, Gifts, and Talents." *Journal for the Education of the Gifted*, 22(2), 137–147.

Brulles, D., Saunders, R., & Cohn, S. J. (2010). Improving performance for gifted students in a cluster grouping model. *Journal for the Education of the Gifted*, 34(2), 327–350.

Burney, V. H. (2008). Applications of social cognitive theory to gifted education. *Roeper Review*, 30(2), 130–139. <https://doi.org/10.1080/02783190801955335>

Callahan, C. M., & Hertberg-Davis, H. L. (2013). Introduction. In C. M. Callahan & H. L. Hertberg-Davis (Eds.), *Fundamentals of gifted education: Considering multiple perspectives*. Routledge.

Cathcart, R. (2005). *They're not bringing my brain out: Understanding and working with gifted and talented learners*. Hodder Education Auckland, New Zealand.

Chessor, D., & Whitton, D. (2007). The impact of grouping gifted primary school students on self concept and achievement. *TalentEd*, 25(2), 7–22.

Colangelo, N., & Davis, G. A. (2002). *Handbook on gifted education*. ERIC.

Colangelo, N., & Wood, S. M. (2015). Counseling the gifted: Past, present, and future directions. *Journal of Counseling & Development*, 93(2), 133–142.

Colangelo, N., Assouline, S. G., Marron, M. A., Castellano, J. A., Clinkenbeard, P. R., Rogers, K., Calvert, E., Malek, R., & Smith, D. (2010). Guidelines for developing an academic acceleration policy. National Work Group on acceleration. *Journal of Advanced Academics*, 21(2), 180–203.

Coleman, L. J., & Cross, T. L. (2005). *Being gifted in school: An introduction to development, guidance, and teaching*. Prufrock Press.

Council of State Directors of Programs for the Gifted. (1999). The 1998–99 state of the states gifted and talented report. Longmont, CO: Author.

Craven, R. G., Marsh, H. W., & Print, M. (2000). Gifted, streamed and mixed-ability programs for gifted students: Impact on self-concept, motivation, and achievement. *Australian Journal of Education*, 44(1), 51–75.

Dare, L., Smith, S., & Nowicki, E. (2016). Parents' experiences with their children's grade-based acceleration: Struggles, successes, and subsequent needs. *Australasian Journal of Gifted Education*, 25(2), 6–21.

Davis, G. A., Rimm, S. B., & Siegle, D. B. (2013). *Education of the gifted and talented: Pearson new international edition*. Pearson Higher Ed.

Davis, G., Rimm, S., & Siegle, D. (2011). *Education of the gifted and talented* (6th ed.). Pearson.

- Dixon, F. A., Yssel, N., McConnell, J. M., & Hardin, T. (2014). Differentiated instruction, professional development, and teacher efficacy. *Journal for the Education of the Gifted*, 37(2), 111–127.
- Faisal, A.-S., & Ghani, M. Z. Bin. (2015). The influence of empathy on academic achievement among gifted students in Saudi Arabia. *Global Journal of Interdisciplinary Social Sciences*, 4(3), 62–71.
- Feldhusen, J. F. (2003). Precocity and acceleration. *Gifted Education International*, 17(1), 55–58.
- Fiedler, E. D., Lange, R. E., & Winebrenner, S. (2002). In search of reality: Unraveling the myths about tracking, ability grouping, and the gifted. *Roeper Review*, 24(3), 108–111.
- Fuchs, L. S., Fuchs, D., Hamlett, C. L., & Karns, K. (1998). High-achieving students' interactions and performance on complex mathematical tasks as a function of homogeneous and heterogeneous pairings. *American Educational Research Journal*, 35(2), 227–267.
- Gallagher, S., Smith, S. R., & Merrotsy, P. (2011). Teachers' perceptions of the socioemotional development of intellectually gifted primary aged students and their attitudes towards ability grouping and acceleration. *Gifted and Talented International*, 26(1–2), 11–24.
- George, P. S. (2005). A rationale for differentiating instruction in the regular classroom. *Theory into Practice*, 44(3), 185–193.
- Gray, E., Ali, A. S., & Favaro, P. (2009). Gifted education program review. *Unpublished Document*). Mississauga, Ontario: Peel District School Board.
- Gray, H. A., & Hollingworth, L. S. (1931). The achievement of gifted children enrolled and not enrolled in special opportunity classes. *The Journal of Educational Research*, 24(4), 255–261.
- Gross, M. U. M. (1997). How ability grouping turns big fish into little fish-or does it? Of optical illusions and optimal environments. *Australasian Journal of Gifted Education*, 6(2), 18–30.
- Gross, M. U. M. (2006). To group or not to group: Is that the question? In *Including the Gifted and Talented* (pp. 130–148). Routledge.
- Hallam, S., & Ireson, J. (2005). Secondary school teachers' pedagogic practices when teaching mixed and structured ability classes. *Research Papers in Education*, 20(1), 3–24.
- Harris, B., Plucker, J. A., Rapp, K. E., & Martínez, R. S. (2009). Identifying gifted and talented English language learners: A case study. *Journal for the Education of the Gifted*, 32(3), 368–393.
- Heinbokel, A. (2010). Acceleration in Europe: Is It an Option? *Gifted and Talented International*, 25(2), 143–151.
- Heltemes, L. (2009). *Social and academic advantages and disadvantages of within-class heterogeneous and homogeneous ability grouping*.
- Hertberg-Davis, H. (2009). Myth 7: Differentiation in the regular classroom is equivalent to gifted programs and is sufficient: Classroom teachers have the time, the skill, and the will to differentiate adequately. *Gifted Child Quarterly*, 53(4), 251–253.
- Herther, N. K. (2009). Digital Natives and Immigrants: What Brain Research Tell Us. *Online*, 33(6), 15–21.
- Hoogeveen, L., van Hell, J. G., & Verhoeven, L. (2012). Social-emotional characteristics of gifted accelerated and non-accelerated students in the Netherlands. *British Journal of Educational Psychology*, 82(4), 585–605.
- Howley, A., Howley, C. B., & Pendarvis, E. D. (1986). *Teaching gifted children: Principles and strategies*. Little, Brown.

Jarwan, F. (2013). Talent, giftedness, and creativity. *Amman: Dar Al Fiker Publisher*.

Johnson, D. W., Johnson, R. T., & Smith, K. A. (2014). Cooperative learning: Improving university instruction by basing practice on validated theory. *Journal on Excellence in University Teaching*, 25(4), 1-26.

Kanevsky, L. (2011). A Survey of Educational Acceleration Practices in Canada. *Canadian Journal of Education*, 34(3), 153-180.

Kanlı, E. (2020). Turkish teachers' views on acceleration. *Cypriot Journal of Educational Sciences*, 15(5), 1249-1261.

Karolyi, C. V, Ramos-Ford, V., & Gardner, H. (2003). Multiple intelligences: A perspective on giftedness. In *Handbook of gifted education* (Vol. 3, pp. 100-112). Allyn & Bacon.

Kretschmann, J., Vock, M., Lüdtke, O., Jansen, M., & Gronostaj, A. (2019). Effects of grade retention on students' motivation: A longitudinal study over 3 years of secondary school. *Journal of Educational Psychology*, 111(8), 1432.

Kulik, J. A. (1992). *An Analysis of the Research on Ability Grouping: Historical and Contemporary Perspectives. Research-Based Decision-Making Series*.

Kulik, J. A. (2004). Meta-analytic studies of acceleration. *A Nation Deceived: How Schools Hold Back America's Brightest Students*, 2, 13-22.

Kulik, J. A., & Kulik, C.-L. C. (1992). Meta-analytic findings on grouping programs. *Gifted Child Quarterly*, 36(2), 73-77.

Laine, S., & Tirri, K. (2016). How Finnish elementary school teachers meet the needs of their gifted students. *High Ability Studies*, 27(2), 149-164.

Ma, X. (2002). Early acceleration of mathematics students and its effect on growth in self-esteem: A longitudinal study. *International Review of Education*, 48(6), 443-468.

Margot, K. C. (2020). *Gifted Education and Gifted Students: A Guide for Inservice and Preservice Teachers*. Sourcebooks, Inc.

Matthews, M. S. (2006). Gifted students dropping out: Recent findings from a southeastern state. *Roeper Review*, 28(4), 216-223.

Matthews, M. S., Ritchotte, J. A., & McBee, M. T. (2013). Effects of schoolwide cluster grouping and within-class ability grouping on elementary school students' academic achievement growth. *High Ability Studies*, 24(2), 81-97.

Merriam, S. B., & Tisdell, E. J. (2015). *Qualitative research: A guide to design and implementation*. John Wiley & Sons.

Milton, M., & Lewis, E. (2005). Teaching gifted children with learning difficulties in writing. *Australian Journal of Learning Difficulties*, 10(2), 79-88.

Moon, S. M., Feldhusen, J. F., & Dillon, D. R. (1994). Long-term effects of an enrichment program based on the Purdue Three-Stage Model. *Gifted Child Quarterly*, 38(1), 38-48.

Moon, T. R. (2005). The role of assessment in differentiation. *Theory into Practice*, 44(3), 226-233.

Morgan, H. (2014). Maximizing student success with differentiated learning. *The Clearing House: A Journal of Educational Strategies, Issues and Ideas*, 87(1), 34-38.

National Association for Gifted Children. (2004). *Acceleration*.

Neihart, M. (2007). The socioaffective impact of acceleration and ability grouping: Recommendations for best practice. *Gifted Child Quarterly*, 51(4), 330–341.

Oakes, J. (2008). Keeping track: Structuring equality and inequality in an era of accountability. *Teachers College Record*, 110(3), 700–712.

Olenchak, F. R. (2001). Lessons learned from gifted children about differentiation. *The Teacher Educator*, 36(3), 185–198.

Othman, A.-S. (2019). The reality of gifted programs in light of some international standards from the point of view of gifted students and teachers at the primary stage. *Journal of Scientific Research in Education*, 20, 83–107.

Poole, D. (2008). Interactional differentiation in the mixed-ability group: A situated view of two struggling readers. *Reading Research Quarterly*, 43(3), 228–250.

Preckel, F., Götz, T., & Frenzel, A. (2010). Ability grouping of gifted students: Effects on academic self-concept and boredom. *British Journal of Educational Psychology*, 80(3), 451–472.

Pressey, S. L. (1949). *Educational acceleration; appraisals and basic problems*. (Bur. Educ. Res. Monogr., No. 31.).

Rakow, S. (2020). *Educating gifted students in middle school: A practical guide*. Sourcebooks, Inc.

Rambo, K. E., & McCoach, D. B. (2012). Teacher attitudes toward subject-specific acceleration: Instrument development and validation. *Journal for the Education of the Gifted*, 35(2), 129–152.
<https://doi.org/10.1177/0162353212440591>

Reis, S. M., Westberg, K. L., Kulikowich, J. M., & Purcell, J. H. (2004). Curriculum compacting and achievement test scores: What does the research say. *Differentiation for Gifted and Talented Students*, 105–116.

Renzulli, J. S., & Park, S. (2000). Gifted dropouts: The who and the why. *Gifted Child Quarterly*, 44(4), 261–271.

Renzulli, J. S., & Renzulli, S. R. (2010). The schoolwide enrichment model: A focus on student strengths and interests. *Gifted Education International*, 26(2–3), 140–156.

Robins, J., & Jolly, J. (2020). *Methods and Materials for Teaching the Gifted*. Sourcebooks, Inc.

Robinson, N. M. (2004). Effects of academic acceleration on the social-emotional status of gifted students. *A Nation Deceived: How Schools Hold Back America's Brightest Students*, 2, 59–67.

Rogers, K. B. (1998). Using current research to make "good" decisions about grouping. *NASSP Bulletin*, 82(595), 38–46.

Rogers, K. B. (2002). Grouping the gifted and talented: Questions and answers. *Roeper Review*, 24(3), 103–107.

Rogers, K. B. (2018). Grouping the Gifted and Talented: Questions and Answers. In *Thinking About Schools* (pp. 367–378). Routledge.

Saleh, M., Lazonder, A. W., & De Jong, T. (2005). Effects of within-class ability grouping on social interaction, achievement, and motivation. *Instructional Science*, 33(2), 105–119.

Saudi Arabia Ministry of Finance. (2018). *Budget*.

Sękowski, A. E., & Łubianka, B. (2015). Education of gifted students in Europe. *Gifted Education International*, 31(1), 73–90.

Sheppard, A. A. (2018). *Knowledge, Perceptions, and Beliefs of Elementary Principals Regarding Whole-Grade Acceleration for Gifted Students*.

Siegle, D., Wilson, H. E., & Little, C. A. (2013). A Sample of Gifted and Talented Educators' Attitudes About Academic Acceleration. *Journal of Advanced Academics*, 24(1), 27–51.
<https://doi.org/10.1177/1932202X12472491>

Slavin, R. E. (1993). Achievement effects of ability grouping in secondary schools: A best-evidence synthesis. *Advances in Education Research*, 1(3), 75.

Steenbergen-Hu, S., & Moon, S. M. (2011). The effects of acceleration on high-ability learners: A meta-analysis. *Gifted Child Quarterly*, 55(1), 39–53.

Steenbergen-Hu, S., Makel, M. C., & Olszewski-Kubilius, P. (2016). What one hundred years of research says about the effects of ability grouping and acceleration on K–12 students' academic achievement: Findings of two second-order meta-analyses. *Review of Educational Research*, 86(4), 849–899.

Subotnik, R., Orland, M., Rayhack, K., Schuck, J., Edmiston, A., Earle, J., Crowe, E., Johnson, P., Carroll, T., & Berch, D. (2009). Identifying and developing talent in science, technology, engineering, and mathematics (STEM): An agenda for research, policy, and practice. In *International handbook on giftedness* (pp. 1313–1326). Springer.

Swastika, G. T., Nahdlatul, U., & Blitar, U. (2019). *JPE (Jurnal Pendidikan Edutama)* Vol. 6 No. 1 Januari 2019 REPRESENTASI PROBLEM SOLVING NON-RUTIN. 6(1), 43–52.

Tieso, C. (2005). The effects of grouping practices and curricular adjustments on achievement. *Journal for the Education of the Gifted*, 29(1), 60–89.

Tomlinson, C. A. (2005). Quality curriculum and instruction for highly able students. *Theory into Practice*, 44(2), 160–166.

Tomlinson, C. A., & Jarvis, J. (2009). Differentiation: Making curriculum work for all students through responsive planning and instruction. In J. S. Renzulli, E. Gubbins, K. McMillen, R. Eckert, & C. Little (Eds.), *Systems and models for developing programs for the gifted and talented* (pp. 599–628). Creative Learning Press.

Tomlinson, C. A., Brighton, C., Hertberg, H., Callahan, C. M., Moon, T. R., Brimijoin, K., Conover, L. A., & Reynolds, T. (2003). Differentiating instruction in response to student readiness, interest, and learning profile in academically diverse classrooms: A review of literature. *Journal for the Education of the Gifted*, 27(2–3), 119–145.

Towns, M. H., Kreke, K., & Fields, A. (2000). An action research project: Student perspectives on small-group learning in chemistry. *Journal of Chemical Education*, 77(1), 111.

Valiandes, S., & Neophytou, L. (2018). Teachers' professional development for differentiated instruction in mixed-ability classrooms: investigating the impact of a development program on teachers' professional learning and on students' achievement. *Teacher Development*, 22(1), 123–138.

Young, M. H., & Balli, S. (2014). Gifted and Talented Education (GATE): Student and Parent Perspectives. *Gifted Child Today*, 37(4), 236–246. <https://doi.org/10.1177/1076217514544030>