How are Gifted Students Doing in Inclusive Settings:

A Systematic Review on Their Motivation and Behaviors

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Samenvatting (NL)

Door de wereldwijde beweging richting inclusief onderwijs is het effect van inclusieve onderwijspraktijken op hoogbegaafde leerlingen een belangrijk onderzoeksonderwerp. Het doel van dit bachelorwerksuk is om de onderzoeksvraag *'What are the effects of inclusive education practices on the motivation and behaviors of gifted students?'* te beantwoorden. Om dit doel te bereiken, is er een systematisch literatuurreview uitgevoerd volgens de richtlijn van de 2020 PRISMA-verklaring. Relevante data van twaalf artikelen is geëxtraheerd en gesynthetiseerd via thematische analyse. Deze analyse suggereert dat convergente differentiatiepraktijken een negatief effect hebben op de motivatie- en gedragsuitkomsten van hoogbegaafde leerlingen in inclusieve onderwijsomgevingen. Divergente differentiatiepraktijken lijken juist een positief effect te hebben. Tevens is gevonden dat praktijken die een competitieve klasomgeving bevorderen het risico op onderpresteren van hoogbegaafde leerlingen in inclusieve onderwijsomgevingen kunnen vergroten. Meer onderzoek zou verdere effecten van competitieve onderwijspraktijken op leerling-uitkomsten in inclusieve onderwijsomgevingen kunnen belichten. Gebaseerd op de resultaten van dit literatuurreview, wordt beleidsmakers geadviseerd om in inclusieve klassen onderwijspraktijken te implementeren die een non-competitieve klasomgeving bevorderen. Ze worden ook geadviseerd om divergente differentiatiepraktijken te implementeren die de motivatie en het gedrag van hoogbegaafde leerlingen positief beïnvloeden. De resultaten van dit literatuurreview kunnen beleidsmakers en leraren helpen om inclusieve onderwijspraktijken te identificeren die een positief effect hebben op de uitkomsten van hoogbegaafde leerlingen. Door te focussen op een specifieke leerling subgroep, geeft dit review beleidsmakers ook handvatten om inclusief onderwijs te ontwerpen dat het internationale streven van ‘education for all’ belichaamt.

Trefwoorden: Gifted Students, Inclusive Education, Systematic Review, Motivation, Behavior

Summary (EN)

Due to the global movement towards inclusive education, the effect of inclusive educational practices on gifted students has become an important research topic. The aim of this bachelor thesis is to answer the research question *'What are the effects of inclusive education practices on the motivation and behaviors of gifted students?'*. To achieve this aim, a systematic literature review was conducted according to the guideline of the 2020 PRISMA-statement. Relevant data was extracted from twelve articles and synthesized through thematic analysis. This analysis suggests that convergent differentiation practices have a negative effect on the motivational and behavioral outcomes of gifted students in inclusive educational settings. Divergent differentiation practices seem to instead have a positive effect. In addition, it was found that practices that promote a competitive classroom environment could increase the risk of underachievement of gifted students in inclusive educational settings. More research could illuminate further effects of competitive educational practices on student outcomes in inclusive educational settings. Based on the results of this literature review, policy makers are advised to implement educational practices in inclusive classrooms that promote a non-competitive classroom environment. They are also advised to implement divergent differentiation practices that affect the motivation and behavior of gifted students positively. The results of this review can help policymakers and educators to identify inclusive educational practices that have a positive effect on the outcomes of gifted students. Through focusing on a specific student subgroup, this review also provides policy makers with tools to design inclusive education that embodies the international aspiration of 'education for all'.

Keywords: Gifted Students, Inclusive Education, Systematic Review, Motivation, Behavior

Introduction

In our contemporary world, inclusivity can be seen as the most agreed upon goal in education. In 1994, over 300 individuals represented 92 governments and 25 international organizations to ratify the Salamanca Statement. They recognized that, to reach the goal of 'education for all', there was a "necessity and urgency of providing education for children, youth and adults with special educational needs within the regular education system," (UNESCO, 1994). In 2006 followed The United Nations' *Convention on the Rights of Persons with Disabilities* (CRPD), a legally binding international agreement signed by 193 parties. Article 24 of the CRPD states that "persons with disabilities should be guaranteed the right to inclusive education at all levels," (United Nations, 2006). Finally, in 2015, the 2030 Agenda for Sustainable Development was adopted by all United Nations member states, embodying their will to achieve "a shared blueprint for peace and prosperity for people and the planet," (*THE 17 GOALS | Sustainable Development*, n.d.). Sustainable development goal 4 (SDG 4) expresses the focused ambition to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" before 2030 (United Nations, 2015). The widespread ratification of these documents seems to reflect a global movement to make space within the education system for those excluded in the past.

This goal is most often pursued through the implementation of inclusive practices (Jardinez & Natividad, 2024). The specific practices and policies that constitute inclusive education differ between countries and institutions. Nevertheless, in all cases, it embodies the values of the above-mentioned documents: to create an inclusive environment where students of all different educational needs can have these needs met in the same educational setting.

Striving towards a more inclusive model of education is an important endeavor within current and future research, considering the reports of numerous studies. These report that many disabled or otherwise challenged students who are currently taught segregated suffer negative or less positive outcomes as a result (Kurth et al., 2016; 2024; Pennington & Courtade,

2014; Taub et al., 2019; Oh-Young & Filler, 2015). Students with complex support needs in segregated settings were reported to be more likely to receive no instruction, be distracted by adults, and have no peer or teacher interactions when compared to similar students in general education settings (Zagona et al., 2022). Although it is a commonly voiced concern that average students could suffer negative academic outcomes when disabled students join their classrooms, previous literature has found mostly positive or neutral effects (Kart & Kart, 2021). Research also suggests that inclusive education could have a positive impact on average-ability students' outcomes, as contact with disabled students could foster cognitive growth and create acceptance among all students (Jardinez & Natividad, 2024). Many educators, lawmakers, and disability advocates find the reported outcomes of disabled students in segregated classrooms alarming. Thus, they advocate for a movement towards more inclusive education, as shown by the above-mentioned documents.

While these documents preach true inclusivity of all students with special educational needs, it can be contended that, due to contemporary discourse, many of their proponents only take disabled students into account when considering inclusion (Arnesen et al., 2006; Miles & Singal, 2009; Saloviita, 2015). As a result, the effects of inclusive education practices on gifted students, who also have special educational needs (Wang & Neihart, 2015), may be under-researched (Tirri & Laine, 2017).

In the past, giftedness was identified only as high cognitive ability, but contemporary perspectives are subject to much discourse (McBee & Makel, 2019; Pfeiffer et al., 2018). Some view it as a social and dynamic attribute that reflects in many domains beyond the cognitive (Elias et al., 2024). Others propose giftedness is a dynamic growth construct pertaining to all learners (Lo et al., 2018). Due to this discourse, many contemporary studies still rely on IQ-tests like the WISC or WAIS to identify giftedness. From this perspective, a total IQ-score of 115 or above would constitute a gifted identity, with different IQ-scores dividing people as mildly, moderately, highly, or exceptionally gifted (Silverman, 2009). Another method of identifying

gifted students constitutes identifying high-scoring students, most commonly the top 10% highest academic scorers, and using their achievements as an indication of giftedness (Nicpon & Pfeiffer, 2011; Sternberg, 2001). Due to the impossible nature of pinpointing a single encompassing theory of giftedness within contemporary research, all scientifically substantiated theories will be equally eligible for use in this review.

As inclusive education practices become increasingly more common due to global efforts, it is important to identify both negative and positive effects of varying practices on the outcomes of all subsets of students. Research on this topic aids policymakers and educators in finding inclusive practices that truly embody the ambition of 'education for all'. Considerable— important and necessary— research has been conducted on the effects of inclusive education practices on disabled and average ability students. In contrast, the outcomes of gifted students are reported far less commonly within contemporary research (Tirri & Laine, 2017). As such, this review aims to identify and help fill this gap by compiling the results of recent research on the outcomes of gifted students in inclusive education settings.

The need to further fill this gap is heightened by the implications of past research, which suggest that gifted students enjoy heightened academic outcomes when receiving segregated education (Plucker & Dilley, 2016). Many gifted students who are currently receiving education are subject to various forms of segregated practices like 'full time', 'pull-out', and 'within-class' grouping based on ability. Though research suggests these practices help meet their needs in the classroom (Feuchter & Preckel, 2022), segregation is becoming increasingly less desirable to implement as we strive towards more inclusive education. As such, conducting more research into the effects of inclusive education practices specifically on the outcomes of gifted students is an important factor in realizing the goal of 'education for all'.

A scientifically substantiated way to review how students are doing is to examine their motivation. According to the Self-Determination Theory of Deci and Ryan (2012), an assessment can be made as to how well the core needs for autonomy, competence and

relatedness of a student are met by examining their motivation. When a student's needs are met in the classroom, research shows that they enjoy both higher life satisfaction and overall better outcomes within and outside the classroom (Rode et al., 2005). Students who report higher motivation also report higher satisfaction (Cock & Halvari, 2001) and overall better academic and personal outcomes (Howard et al., 2021). On the flipside, according to research, reported or observed low motivation could be an indication of unmet needs and could be correlated to lower student satisfaction (Deci & Ryan, 2012), underachievement (Obergriesser & Stoeger, 2015), and lower academic and personal outcomes (Howard et al., 2021). A number of associated terms related to either Self-Determination Theory or other theories of motivation are used to study student motivation within and outside the classroom. For the purpose of this review, all scientifically substantiated terms related to student motivation are within a relevant scope to answer the research question.

Another scientifically substantiated method of gauging a student's wellbeing and motivation is to examine their behavior (Touré-Tillery & Fishbach, 2014). Substantial evidence supports that the prevalence or absence of certain behaviors can help to identify reasons for possible underachievement (Kulkarni et al., 2021). According to research by Hoffmann et al. (2021), an important factor in the successful implementation of inclusive education was a positive behavioral climate in the classroom, which predicted positive motivational outcomes among students. The effects of mixed-ability classroom dynamics on social behaviors of gifted students are also an important factor of inclusive education to consider, when the ambition of inclusive education includes teaching all students within the same classroom. As the goal of this review is to report how gifted students are doing in inclusive settings, all scientifically substantiated terms related to student behavior are within a relevant scope to answer the research question.

What does previous research report about the motivation and behavior of gifted students in inclusive education settings? Firstly, evidence supports that different inclusive practices can

have diverse effects on gifted students. Forms of divergent differentiation have been reported to have positive effects on their wellbeing and attitudes of learning (Akar, 2020; Altintas & Ozdemir, 2015; Bellamy, 2005; Freedberg et al., 2019). However, these practices might be hard to implement in mixed-ability classrooms, as even experienced teachers report difficulties (De Neve et al., 2014; Smit & Humpert, 2012; Tomlinson et al., 2003). Forms of convergent differentiation seem easier to implement, but evidence suggests they might affect gifted students' wellbeing and attitudes of learning negatively, instead (Prast & Hickendorff, 2023).

Second, it is often quoted that the social behaviors of gifted students are divergent from their non-gifted peers (Rimm, 2002). This suggests that different outcomes can be observed when gifted students interact in mixed-ability settings, as opposed to when they interact within gifted peer groups. Cross et al. (2019; 2022) found that gifted students often engage in code-switching when interacting with non-gifted peers in inclusive classrooms, matching their language to those around them. This could have a negative effect on their personal and academic outcomes, as it may encourage them to hide their gifted abilities as a means of enjoying better social outcomes (Cross et al., 2019; 2022). Broader research on code-switching also found that this practice often negatively affected self-worth and feelings of belonging in students (Wright et al., 2022). This effect could extend to gifted students in inclusive classrooms. Further, Elias et al. (2024) reported that gifted students may have difficulties with their social-emotional outcomes, and that in inclusive settings these skills should be intentionally developed.

As for previously reported motivational outcomes, gifted students were generally observed to have higher achievement motivation in inclusive classrooms than their non-gifted peers. This effect was ascribed to them attributing greater importance to achieving academic outcomes (Sierra et al., 2015). Gifted students were also reported to experience higher motivational and academic outcomes in inclusive classrooms when receiving more autonomy support, compared to their non-gifted peers (Shin & Ahn, 2014). Although some studies do

report motivational outcomes of gifted students in inclusive settings, many researchers do not relate these outcomes to settings or practices; research specifically on the effects of inclusive settings on gifted students' motivation—achievement or otherwise—is scarce. In the last 10 years, only a few scattered peer-reviewed articles have been published that specifically draw attention to motivational outcomes. Thus, the current review aims to pay close attention to motivational outcomes to hopefully further identify and help close this gap in knowledge.

In addition, this review aims to be a contemporary overview of the last 10 years of research on the behavior and motivation of gifted students in inclusive settings, through which trends and outcomes of the past and present can be compared. As described above, this review also aspires to be a resource which could potentially aid lawmakers and educators in identifying inclusive education practices that embody the goal of 'education for all'. But above all, this review aims to further help identify how gifted students are really doing in inclusive settings. As such, the research question is formed:

"*What are the effects of inclusive education practices on the motivation and behaviors of gifted students?*"

Methodology

It was decided that conducting a systematic literature review would be the optimal method to answer the research question. A systematic literature review is a type of research that retrieves, assesses, and summarizes all available evidence on a particular question or topic, and then attempts to reconcile and interpret it (White & Schmidt, 2005). By using this method, an extensive overview of published research can be made in a transparent and reproducible manner. This gives insight into the full research landscape on a particular topic with minimal bias (Lame, 2019). Through analyzing this full landscape of research, the question of how gifted students are doing in inclusive settings can be answered more extensively than through conducting a single individual study.

To ensure the quality of this review, the 2020 PRISMA-statement was used as a guide to report why the review was done, how it was done, and what results were found (Page et al., 2021). The 2020 PRISMA-statement is widely endorsed by editorial organizations and scientific journals as the preferred guideline of reporting systematic reviews (*PRISMA Endorsement — PRISMA Statement*, 2025; Page et al., 2021). The full methodological process was conducted by a single researcher between February and June 2025.

Search strategy

A SPIDER (Sample, Phenomenon of Interest, Design, Evaluation, Research Type) process was used to develop a search string and eligibility criteria that would adequately identify literature relevant to this review. SPIDER is a search strategy to find research to answer a mixed-method qualitative research question (Cooke et al., 2012). It was decided to use SPIDER over the more commonly used PICO (Patient/Problem/Population, Intervention, Comparison/Control/Comparator, Outcome(s)), because when components were separated based on this method, the initial keywords better represented the asked question. Thus, the SPIDER strategy was better suited to finding relevant literature.

During this SPIDER process, the electronic EBSCOhost databases ERIC, PsycINFO and SocINDEX were explored using keywords identified through SPIDER and preliminary research conducted to find literature relevant to the theoretic framework. Further related keywords were identified via the EBSCOhost thesaurus and included in search string development. See table 1 for the full finalized search string. In addition, see attachment 1 for an overview of the separate search components before being combined by Boolean operators.

The final search was conducted via the electronic databases ERIC, PsycINFO, SocINDEX, SCOPUS, and Web of Science. The keywords in the search string were searched for in titles, abstracts, and keywords of data published on these five databases up to March 2025. Based on the small quantity of literature found, it was decided that the initial search would

Table 1

The full search string

(Gifted OR Talent*) AND ("Inclusive education" OR "Inclusive school" OR Inclusi* OR "general setting*" OR "general school*") AND (Motivation* OR Engagement OR "Achievement Motivation*" OR Participation* OR Behaviour* OR Behavior*)*

not be limited for peer-review, publication year, or any other limiters. This minimized the chance that relevant research would be lost due to an arbitrary cut-off date, and allowed for an informed choice to be made as to what criteria to enforce after identifying all possibly relevant literature. Beforehand, it was decided that if ten or more peer-reviewed studies published in the last ten years (2015-2025) of adequate quality were found eligible, this would be the cut-off date and only peer-reviewed—or otherwise scientifically substantiated literature—would be included. If not, older and non-peer-reviewed literature would be considered. This criterion was satisfied. The eligible studies found through the database search were used for snowball sampling though the citation search function on Google Scholar. Finally, the quality of the final eligible studies was assessed through the Mixed-Methods Appraisal Tool (MMAT) (Hong et al., 2018). If quality was judged exceptionally poor, a study could still be excluded. See table 2 for the full list of eligibility criteria.

Study selection and results of the literature search

Using the search string, 2234 studies were found across all searched databases. These studies were exported to the Rayyan.ai website (Ouzzani et al., 2016) to screen their titles, abstracts, and finally full-texts until only eligible literature was left. Of these 2234 pieces of literature, 399 duplicates were removed. Through title screening, 1395 further studies were excluded (e.g., studies about corporate talent development or the behavior of particles). The

Table 2

Eligibility criteria

Inclusion	Exclusion
Students classified as ‘gifted’, ‘talented’, or as other related terms like ‘high-ability’ All scientifically substantiated identification methods	Studies about ‘twice-exceptional’ students that report no separate results for gifted students without disabilities
Inclusive or general education settings	Higher and adult education programs
Student outcomes related to motivation or behavior Related scientifically substantiated terms like ‘engagement’, ‘participation’ and ‘achievement motivation’ are also accepted	
All study designs	Quality judged too low through the Mixed Methods Appraisal Tool (MMAT)
Studies conducted in any country	Literature not available in English or Dutch
Peer-reviewed articles Scientific book chapters Government reports	Unpublished articles Dissertations Pamphlets and other literature found on school websites
Published between 2015 and 2025	

remaining literature was screened for in- or exclusion based on the eligibility criteria through their abstracts, after which 406 more pieces were excluded. Finally, 32 pieces of literature were

read in full, after which 10 eligible studies were found. Through snowball sampling of these 10 pieces, 5 more potential studies were identified, of which 2 were found eligible and included. Together, this process yielded 12 eligible studies. These final 12 pieces of literature were assessed for quality via the Mixed Methods Appraisal Tool (MMAT) (Hong et al., 2018). This appraisal tool consists of seven questions about the paper, of which five are dependent on the study type. These questions can be answered with 'yes' or 'no', and thus, the quality was judged on a seven-point scale, with a point given for each 'yes'. The lowest given score was a 5.5 out of 7, which was decided to be adequate by the researcher. As a result, none of the 12 eligible studies were excluded due to quality concerns.

Because the beforehand decided criteria of finding at least 10 eligible peer-reviewed studies from 2015 and onward was satisfied, the search was concluded. Thus, the final sample of literature included in the current review consisted of 12 pieces of literature. See figure 1 for the PRISMA chart summary of the selection procedure.

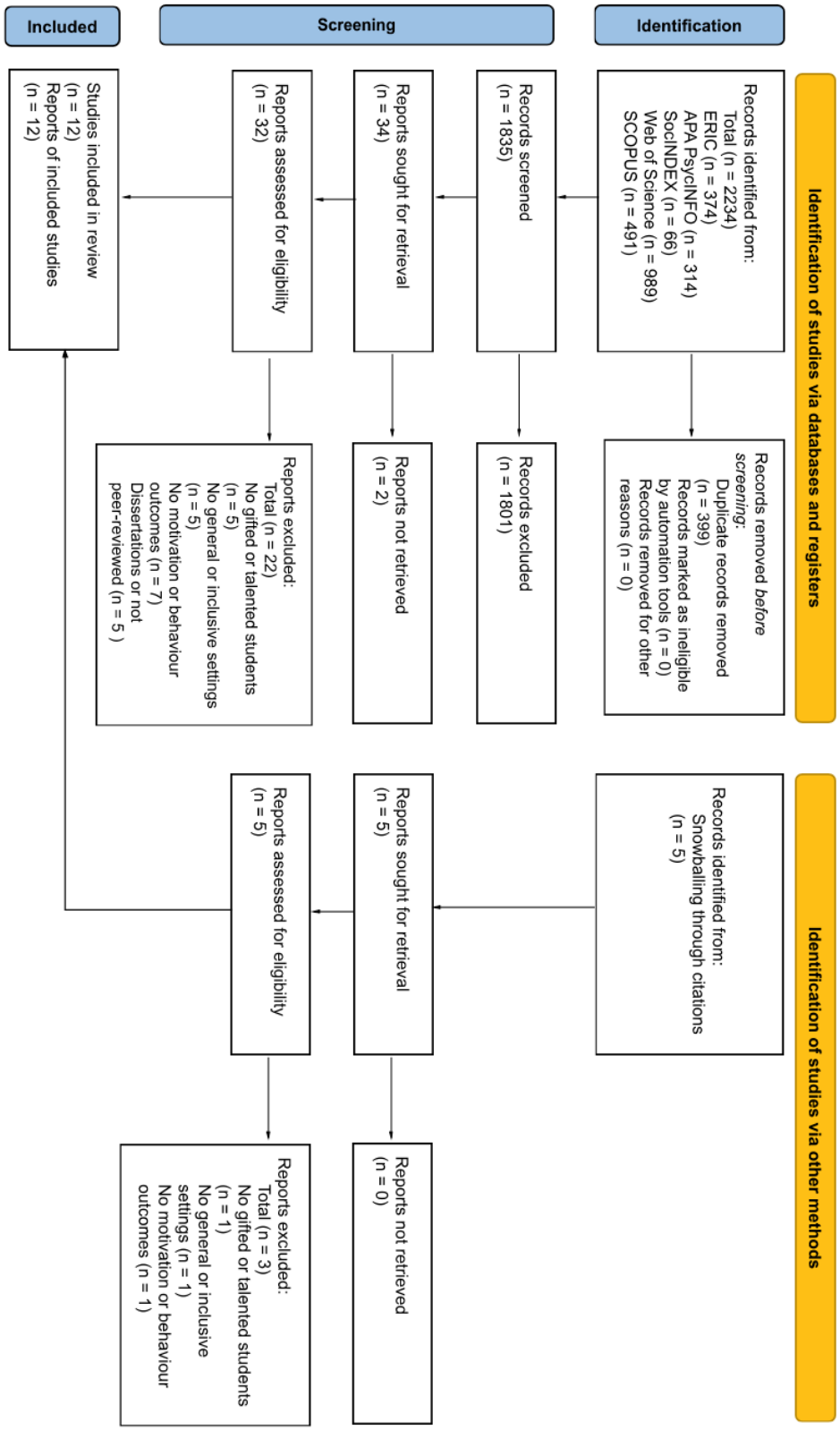
Data extraction and analysis

Data was extracted from all literature that met the eligibility criteria. The data extracted included: authors; country; publication date; study design; sample size (n = ?); participant characteristics (e.g., age, gender, level of giftedness); setting (e.g., primary or secondary education, inclusive or general education, classroom demographics); reported outcomes (e.g. motivation, negative or positive behavior, participation); and finally results, findings, and conclusions. Due to the small sample size of n = 12 studies, data was analyzed via thematic analysis and results were synthesized and reported in a narrative format.

Thematic analysis is a form of analysis often described as suited for qualitative research, as it allows researchers to focus on examining themes or patterns of meaning within data without relying on quantification (Riger & Sigurvinsdottir, 2016). Specifically reflective thematic analysis, first described by Braun and Clarke (2006), was used. Their six-step method is both

Figure 1

PRISMA Flow diagram of the selection procedure



viable to use within research conducted only by a single researcher, and allows for a transparent and reproducible approach. The first step was for the researcher to familiarize themselves with the found data. The second was to find patterns within this data and to develop these patterns into codes. During the third step, the developed codes were clustered together within themes constructed by the researcher. During the fourth, these themes were assessed critically and changed or expanded if they did not yet accurately reflect the data. As fifth, the decided themes were formally defined and named. And finally, during the sixth step, the synthesized results were written down. Via this inductive approach, two overarching themes were identified in the dataset: (1) outcomes related to educational practices, and (2) outcomes related to mixed-ability classroom dynamics. In all cases, the 'outcomes' are the motivational and behavioral outcomes of gifted students in inclusive settings. See figure 2 for a partially developed code tree that serves as an example of how patterns found within the data were developed into themes. Due to the set word limit, not all codes are presented.

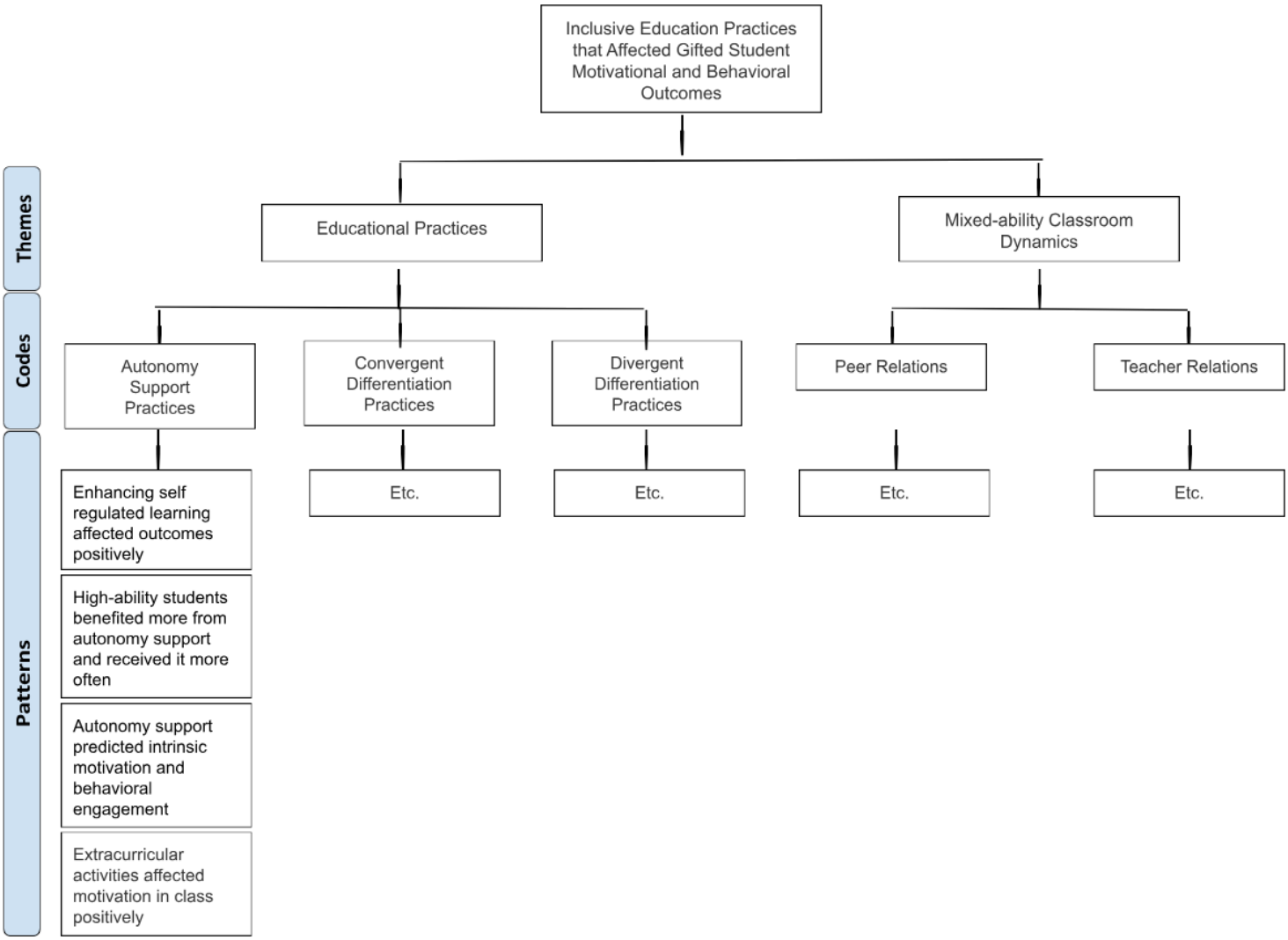
Results

Of the 12 included studies, seven were literature reviews. Three of these reviews were systematic, and five reported countries where included research was conducted. Of the five other pieces of literature, two employed qualitative designs and three quantitative. Specific research methods included semi-structured interviews, repeated questionnaires, and surveys.

Of the total of 12 studies, seven used the term 'gifted', four 'high ability', and one 'profoundly gifted' to describe the participant groups relevant to the current review. All settings included gifted or high-ability students, average-ability students, and in most but not all cases, disabled or low-ability students. Most pieces of literature did not specify demographic compositions beyond confirming they included students of mixed-ability. Two pieces of literature reported results only from primary education settings, four only from secondary education

Figure 2

Partially developed code tree as an example of the coding method



settings, and six from both. The reported outcomes used varied terminology, but for the sake of this review they were sorted into two groups; behavioral outcomes (‘peer relations’, ‘social adjustment’, ‘coping strategies’, ‘behavior that aided school satisfaction’, ‘behavioral engagement’, ‘academic achievement’, ‘the development of emotional health’, ‘underachievement’, ‘socio-emotional skills’, ‘classroom behavior in mixed-ability settings’) and motivational outcomes (‘affective-motivational learning outcomes’, ‘affective-motivational

characteristics', 'the effect of boredom on motivation', 'intrinsic motivation', 'engagement', 'autonomous' and 'controlled motivation', 'individual' and 'situational interests')**.** Four studies reported behavioral outcomes and three motivational outcomes, and the other five reported both. See table 3 for a summary of the found literature.

Results will be presented in two sections to answer the research question, *what are the effects of inclusive education practices on the motivation and behavior of gifted students?* First, the negative and positive outcomes found to be related to specific educational practices will be discussed. Convergent and divergent differentiation will be considered, as well as practice that supports student autonomy. Next, gifted student outcomes that were reported to be related to mixed-ability classroom dynamics will be discussed, specifically in the context of both teacher and peer relations. Through discussing these themes, a thorough overview of the results will be presented.

Negative and Positive Outcomes Related to Educational Practices

Eight studies reported the effects of educational practices used in inclusive education settings on the outcomes of gifted students, with mixed results. When discussing convergent differentiation practices, studies used terms such as 'having to wait for other students to catch up', 'receiving less differentiated instruction', 'lack of acceleration opportunities', and 'curriculum mismatched to students' needs'. When discussing divergent differentiation practices, terms like 'adjusting the curriculum', 'providing differentiated instruction', and 'inquiry-based learning' (IBL) were used. And finally, to describe practices that supported students' autonomy, studies used the terms such as 'enhancing self-regulated learning' and 'autonomy support'.

Convergent Differentiation

Three studies reported effects of convergent differentiation practices on the motivational or behavioral outcomes of gifted students, with overall negative effects. All gifted students interviewed by Hinterplattner et al. (2022) connected their secondary school experience with

Table 3

Summary of the found literature

Reference	Country	Study Design	Participants and Settings	Reported Outcomes and Findings
Barbier et al. (2023)	Germany Kuwait Nether-lands Romania USA	Systematic review	n = 17 empirical studies high-ability students primary education	High-ability students benefit from: ● enhancing self-regulated learning ● adjusting the curriculum ● providing differentiated instruction
Farmer et al. (2019)	Not specified	Literature review	n = 15 empirical studies Gifted students Primary and secondary education	Competitive classroom environments: ● impact peer relations ● cause underachievement Affected by: ● IQ difference size between the class average and gifted students ● The kind of giftedness a student displayed
Hinter-plattner et al. (2022)	Austria	Qualitative research Semi-structured interviews	n = 12 gifted students n = 11 schools Secondary education	Gifted students experienced a loss of motivation because of: ● waiting and boredom ● poor teachers ○ which mainly resulted in behavioral-avoidance strategies
Lam et al. (2018)	China	Qualitative research Semi-structured interviews	n = 21 students with high-ability and high satisfaction Primary and secondary education n = 3 primary n = 3 secondary	Factors that led to high school satisfaction and motivation: ● positive teacher-student relationships ● classmates' emotional and instrumental support ● extracurricular talent development opportunities
Lavrijsen et al. (2024)	Belgium Flanders	Quantitative research Repeated question-naires	n = 3586 high-ability students Secondary education n = 27 schools n = 166 classes	High-ability students: ● received less differentiated instruction ● benefited more from autonomy support ● received more autonomy support ○ Which predicted intrinsic motivation and behavioral engagement

Maker & Wearne (2019)	Australia China Korea New Zealand	Literature review	n = 11 empirical studies Primary education REAPS model Mixed-ability students	Gifted students reported high motivation during the REAPS program due to: ● the program's hands-on approach ● solving real problems ● The effect did not translate to regular lessons
National Asso-ciation for Gifted Children (2018)	United States	Literature review	n = 22 professionals Gifted students Primary and secondary education K-12	Gifted students: ● demonstrate good adjustment ● may require assistance to cope with peer relations ● may underachieve without raising suspicion
Raoof et al. (2024)	Not specified	Systematic review	n = 33 empirical studies Underachieving gifted students Primary and secondary school	● Teacher personality and organization influenced student achievement ● students who performed well in school became more interested in learning ● Students may hide their giftedness to gain peer support and avoid peer pressure.
Rocha et al. (2024)	Spain	Quantitative research question-naire	n = 143, of which n = 51 high ability students Primary and secondary school n=1 school n=1 other setting	Gifted students experienced: ● greater dissatisfaction in choice of friends and social relationships ● greater dissatisfaction in the education they received
Schultz (2018)	United Kingdom	Literature review	n= 3 empirical studies, containing n = 87 profoundly gifted students (IQ more than 3 SD above average) Primary school	Profoundly gifted students: ● Have needs that are underidentified and underadressed ● Display frustrations when being misunderstood by average ability students
Slapničar et al. (2024)	Slovenia	Quantitative research Random-ised controlled trial	n = 264, of which n = 112 gifted students Secondary education n = 17 schools IBL (inquiry-based learning)	During IBL gifted students showed: ● Higher attitudes of IBL ● Heightened motivation and interest both in and after the module
Ziernwald et al. (2022)	Australia Canada	Systematic review	n = 49 empirical studies	● Teachers and students perceived DI as valuable

Germany Great Britain & Ireland Nether-lands Turkey USA Other	High-ability students Primary and secondary education DI (differentiated instruction)	● DI might be particularly helpful for high-ability students ● DI has only been implemented to a small extent ● DI effected academic achievement and motivational-affective characteristics of gifted students positively

waiting. Reasons for waiting included ‘poor teachers’, described as teachers that used convergent differentiation methods like making excelling students wait in class while other students caught up. Gifted students also reported feelings of boredom, which resulted in both a loss of motivation and various coping behaviors. Most of these behaviors were behavioral-avoidance strategies, like talking with other students or doing homework (Hinterplattner et al., 2022). Raoof et al. (2024) reported several ‘school factors’ that they claimed contributed to the ‘failure’ of gifted students, several of which are related to convergent differentiation practices. These factors were ‘boredom’, ‘lack of acceleration opportunities’, ‘curriculum mismatched to student’s needs’, and ‘no extracurricular involvement'. According to their research, these factors led to a decrease in academic interest, engagement, motivation and performance of gifted students. These factors seem to correspond to the experiences students described in the study of Hinterplattner et al. (2022).

Lavrijsen et al. (2024) found that high-ability students reported that their teachers engaged less often in divergent differentiated instruction relative to their average-ability peers, which meant they more often focused their differentiation practices on students that needed more time instead of less. Thus, they implemented convergent differentiation. This resulted in lowered behavioral engagement scores across all high-ability students compared to average-ability students, which seemed to affect their participation in academic activities and their efforts to perform academic tasks (Lavrijsen et al., 2024). Thus, all studies that are subject to this

review reported that gifted students experiencing convergent differentiation practices experienced negative motivational and behavioral outcomes.

Divergent Differentiation

Seven studies reported the effects of divergent differentiation practices on behavioral or motivational outcomes of gifted students, with overall positive effects. Divergent differentiation practices were reported to have positive effects on the intrinsic motivation of gifted students (Lavrijsen et al., 2024). Ziernwald et al. (2022) found great heterogeneity in their systematic review, but also reported that “more positive than negative effects [of differentiated instruction] were found.” According to their study, high-ability students were among those most ill-served when curriculum and instruction were not differentiated. Barbier et al. (2023) also found that providing differentiated instruction was one of four educational practices that seemed to have a positive impact on cognitive learning outcomes. Both Barbier et al. (2023) and Ziernwald et al. (2022) suggest that gifted students being taught through divergent differentiation practices experience higher cognitive and academic outcomes through the fostering of better behaviors in the classroom. This could also have a positive effect on student’s achievement motivation, as Raoof et al. (2024) found that gifted students who performed well in school became more interested in learning. Finally, both Maker & Wearne (2019) and Slapničar et al. (2024) studied the effects of specific non-formal programs that use divergent differentiation methods. Both found that gifted students experienced higher levels of motivation as a result. Inquiry based learning (IBL) was found by Slapničar et al. (2024) to have a positive effect on student motivation due to its practice that uses divergent differentiation practices, such as ‘learning driven by a process of inquiry’. Maker & Wearne (2019) instead reported that students experiencing Real Engagement in Active Problem-Solving model (REAPS) reported positive outcomes not due to divergent differentiation practices, but the hands-on nature of the program. Thus, though there is heterogeneity in results, most studies that are subject to this review report

that divergent differentiation practices had a positive effect on the motivational and behavioral outcomes of gifted students.

Autonomy support

Four studies reported effects of practice that fostered autonomy support on the behavioral or motivational outcomes of gifted students, with overall positive effects. Although autonomy support was linked to divergent differentiation practices within the included literature, it is discussed separately due to the volume of reported effects. Lavrijsen et al. (2024) found that gifted students reported greater benefits of experiencing autonomy support than their average-ability peers. Their study directly linked positive behavioral and motivational outcomes of gifted students in inclusive settings to autonomy support. This effect was measured both between and within mixed-ability classes. Barbier et al. (2023) found similar results, reporting that practice that fostered self-regulated learning had positive effects on the motivational outcomes of gifted students. Gifted students that experienced high satisfaction at school reported that receiving the freedom and autonomy to pursue school-sponsored extracurriculars like music and sports had positive effects on their motivation in the classroom (Lam et al., 2018). Students viewed these activities not as a ‘distraction’, but rather as something that heightened their motivation and allowed them to “stretch themselves to show their talent”. About this, Lam et al. (2018) wrote; “Some goals students set for themselves were not academic, yet they helped them try their best academically.” Raoof et al. (2024) also found that extracurricular involvement had an effect on gifted students’ motivation, as students named the lack thereof as a factor in their lowered motivation or even underachievement.

Negative and Positive Outcomes Related to Mixed-ability Classroom Dynamics

Five studies reported gifted student outcomes related to social relations with both teachers and peers in mixed-ability classrooms, with mixed effects. When discussing teacher relations, studies used terms such as ‘high teacher sensitivity’, ‘positive teacher-student relationships’, ‘student attitudes of teachers’, ‘unreasonable teacher attitudes’, and ‘inability to

identify or address gifted students'. When discussing peer relations, terms like' classmates' emotional and instrumental support', 'ostracization', 'underachievement', 'competitive classroom environments', 'social difficulties', 'peer acceptance', 'bullying behavior' and 'dissatisfaction with their choice of friends and social relationships' were used.

Teacher Relations

Three studies reported motivational and behavioral outcomes of gifted students related to teacher practices and relations. Gifted students interviewed by Lam et al. (2018) named their 'positive teacher-student relationships' and their teacher's 'high sensitivity to their individual needs' as important factors to their heightened motivation (Lam et al., 2018). Raoof et al. (2024) found that the attitudes of gifted students toward their teachers had a relation to their academic achievement, and that unreasonable teacher attitudes were often a factor in negative behavioral or motivational outcomes observed in gifted students. On the topic of student-teacher relations, Schultz (2018) argued that "the current inability of most educators to identify and even minimally address needs leaves these [profoundly gifted] students anxious, frustrated, and otherwise unable to reach their intellectual capacity in the majority of school settings across the country." Schultz (2018) study may, however, only be relevant to a subset of gifted students, as he only included samples of profoundly gifted students with at least an IQ-score 3 standard deviations above average.

Peer Relations

Four studies reported gifted student outcomes related to mixed-ability classroom dynamics in inclusive educational settings. Gifted students interviewed by Lam et al. (2018) named their "classmates' emotional and instrumental support" as something that influenced their motivation to achieve positively. They reported higher motivational outcomes if they felt like their peers were also motivated to achieve, regardless of the actual achievement levels of their mixed-ability classmates. Farmer et al. (2019) reports that in mixed-ability classrooms, gifted students are relatively well accepted by peers and rarely involved in bullying behavior, but a

different trend was observed in profoundly gifted students with an IQ of three or more standard deviations above average. These students often did not realize that their mixed-ability peers could not think as fast as them and displayed frustrations when being misunderstood (Schultz, 2018).

A number of gifted students also reported experiences with ostracization in inclusive mixed-ability settings (Lam et al., 2018). Multiple studies linked this outcome to competitive classroom practices that drew attention to performance differences between students (Farmer et al., 2019; Lam et al., 2018). On this subject Farmer et al. (2019) wrote; “when ability differences are visible to peers, social comparisons can lead to peers’ envy of gifted students or negative feelings about their own abilities.” According to both Lam et al. (2018) and Raoof et al. (2024), experiences with and fear of ostracization could lead to the potential underachievement of gifted students. Some students were found to hide their gifted abilities on purpose, so as to not hurt their peers or their own class-relations. The emergence of this behavior could also be related to what kind of giftedness a student displays. Verbally gifted students, whose giftedness was apparent in every conversation, were reported to have more trouble interacting with peers than mathematically gifted students (Farmer et al., 2019). Farmer et al. (2019) also found a trend where a larger discrepancy between average class IQ and the IQ of academically gifted students coincided with less peer acceptance. These findings suggest that verbally gifted and highly gifted students, such as the profoundly gifted described by Schultz (2018), may be at higher risk of underachievement due to fear of ostracization in mixed-ability classrooms that foster competitive classroom practices (Farmer et al., 2019: Raoof et al., 2024; Schultz, 2018).

Discussion

What are the effects of inclusive education practices on the motivation and behaviors of gifted students?” Though results were diverse, two main components of inclusive education practices that affected the outcomes of gifted students could be identified: (1) convergent and divergent differentiation practices and (2) mixed-ability classroom dynamics. Convergent

differentiation practices were found to have overall negative effects on the motivational and behavioral outcomes of gifted students in inclusive settings. Reportedly, these practices led to boredom and a loss of motivation, which students coped with through employing behavioral-avoidance strategies (Hinterplattner et al., 2022). These feelings of boredom could be a factor in the emergence of underachievement in gifted students (Raoof et al., 2024). Despite heterogeneity of results, divergent differentiation practices were found to instead have overall positive effects on the motivational and behavioral outcomes of gifted students in inclusive settings. Some specific forms of practice related to divergent differentiation had unchallenged positive effects on the behavioral outcomes of gifted students (Barbier et al., 2023; Maker & Wearne, 2019; Slapničar et al., 2024), while others reported mixed but still overall positive effects (Lavrijsen et al., 2024; Ziernwald et al., 2022). The positive effects of divergent differentiation were often linked to practice that fostered autonomy and individual learning when discussing gifted students (Lavrijsen et al., 2024; Barbier et al., 2023).

In the reviewed studies, mixed-ability relations were found to be an important factor in the social behavior of gifted students in inclusive settings. Motivated peers, regardless of ability, were a positive factor on the motivational outcomes of gifted students (Lam et al., 2018). Gifted students were reported to generally be well adjusted in mixed-ability classrooms and to not typically be engaged in negative behaviors like bullying (Farmer et al., 2019). On the other hand, they often reported being dissatisfied with their choice of friends and quality of friendships (Rocha et al., 2024). Social relations became increasingly more difficult for gifted students when the difference between their IQ and the class average increased (Farmer et al., 2019). Fear of ostracization was an important factor in the emergence of underachievement due to gifted students potentially hiding their abilities. Relatedly, gifted students were reported to suffer socially in competitive classroom environments that drew attention to performance differences (Lam et al., 2018; Raoof et al., 2024). These results support there being a relationship between

underachievement due to peer relations and practice that fosters a competitive classroom environment (Lam et al., 2018; Raoof et al., 2024; Farmer et al., 2019).

Most key findings of this review were in line with results reported by previous research. The effects of convergent and divergent differentiation practices on students, gifted or otherwise, are a relatively popular topic of research both before and after the timeframe of the current review (Akar, 2020; Altintas & Ozdemir, 2015; Bellamy, 2005; Freedberg et al., 2019; Prast & Hickendorff, 2023), though this outcome is often linked to academic results. The results of this review illustrate that outcomes remain in the same trend when behavior and motivation are specifically considered. The positive effect of autonomy support on the motivational and behavioral outcomes of gifted students found in previous research was also confirmed by the results of the current review (Min & Doehee, 2014; Lavrijsen et al., 2024; Barbier et al., 2023).

A small difference in results was found on the topic of social behavior. In past research, most studies reported mainly negative outcomes due to social difficulties gifted students faced in mixed-ability classrooms (Cross et al., 2019; 2022). Though this perspective was also present in the current review (Lam et al., 2018; Raoof et al., 2024; Farmer et al., 2019; Rocha et al., 2024), there were also positive effects found. Namely, the findings that gifted students were relatively well adjusted in inclusive settings (Farmer et al., 2019) and were motivated to achieve by motivated peers regardless of ability (Lam et al., 2018).

Further, the finding that inclusive education practices can lead to an increase of underachievement in gifted students was present in both in previous research and the current review (Lam et al., 2018; Raoof et al., 2024; Farmer et al., 2019; Cross et al., 2019; 2022). The results of this review support there being a link between underachievement due to peer relations and practice that fosters a competitive classroom environment (Lam et al., 2018; Raoof et al., 2024).

The current review found that certain behavioral and motivational outcomes of gifted students were reportedly related to personal factors of subsets of gifted students. Though an

influence of personal factors on outcomes is not unexpected, these results explore a further nuance in the experiences of gifted students that is not typically reported in previous research. Verbally gifted students were reported to face more social difficulty than mathematically gifted students (Farmer et al., 2019), and thus, could also be at a higher risk of underachievement (Raoof et al., 2024). This difference between verbally and mathematically gifted students could also be related to code-switching behavior proposed by Cross et al. (2019; 2022); the students code-switching their gifted language to relieve social difficulties may be the same students who intentionally underachieve for much the same reason. Thus, to relate this finding to the research question, the field where a student displays their giftedness was found to be a possible factor in their motivational and behavioral outcomes in inclusive settings.

Conclusion

The results of this review affirm the outcomes of previous research, where divergent differentiation had overall positive effects, and convergent differentiation had overall negative effects on motivation and behavior. Further, the current review reports that social difficulties with peers may lead to underachievement in gifted students in inclusive settings, especially when a competitive classroom environment is fostered.

This review has several limitations that should be taken into account when considering the results. First, it has to be considered that not all research relevant to answering the research question was found. Within the search string, only the terms ‘gifted’ and ‘talented’ were used to identify gifted students. This might have led to the exclusion of studies using other terms, such as; ‘mentally advanced’, ‘high cognitive ability’, ‘savant’, or ‘genius’. Non-English studies were excluded, which could pose a risk of bias towards English-speaking countries. These methodological choices both contribute to a possible risk of misrepresenting the proposed holistic picture of research of the last 10 years. Another limitation was the relatively small sample size but broad scope of settings; though all studies pertained inclusive education and gifted students, there were many cultural differences between settings that were not taken into

account. Can outcomes between Chinese, American and European gifted students be compared in a meaningful way when the sample size of studies is only 12? Another limitation was the use of other literature reviews. Though the goal of the current review is to show a contemporary perspective of the last 10 years of research, the use of other reviews meant that older literature was technically included. Finally, some outcomes were only reported by single studies included in this review, and thus, had low credibility and were difficult to synthesize. In turn, this lessened the overall credibility of the full review. Deciding to only include contemporary research led to such a thinning of potential studies that a broad scope of results that was hard to synthesize meaningfully was included.

Related to the final limitation, I would advise future researchers to employ a narrower scope of outcomes spread over a broader timeframe. As the research on motivations and behaviors is often split, following this split down a narrower path could yield results that are more synthesizable, and thus, more credible. Next, I found that studies focusing on the effects of inclusive education practices on the intrinsic motivation of gifted students were scarce. Even though intrinsic motivation, according to Deci and Ryan (2012), can be a large indicator of a student's overall wellbeing. More research specifically on intrinsic motivation and what kind of inclusive practices most effectively trigger it in gifted students would be advisable. Further, based on the results of this review, further research into the effects of competitive classroom environments on underachievement in gifted students would be interesting. Contemporary research posits that competitive classroom environments are not as detrimental to student development as thought in the past (Fülöp et al., 2024), but it could very well be that the effects are drastically different when implemented in fully inclusive classrooms. As we approach the 2030 Sustainable Development deadline and continue to push for the implementation of inclusive education, all research that helps sketch a picture of effective 'education for all' will benefit the field of education. This is why I hope that in a future review, research that explores optimal practice related to motivational and behavioral outcomes for specific student groups—

like gifted students— could be synthesized to perhaps shed light on what could be a sustainable middle road. This type of research would also aid the solidification of a definition of inclusive education amidst the discourse.

What are the effects of inclusive education practices on the motivation and behaviors of gifted students? Through trying to answer this question, I found that the field of research exploring the motivation and behaviors of students is substantial, just like the field exploring giftedness. Studies on the topic of inclusive education are also abundant, but within contemporary research the most asked question does no longer seem to be 'what works best', but 'does this work at all'?

There are many practical constraints to consider when designing educational policy that best embodies the goal of 'education for all', while simultaneously satisfying the Salamanca Statement's (1994) commitment of doing this "within the regular education system". When defending the opinion that fully inclusive education would not be in the best interest of all students, and thus, be counterintuitive, the negative experiences of gifted students are often hailed as an argument (Tirri & Laine, 2017). But, in this review, these experiences were only reported by students experiencing convergent differentiation, which is not the only type of inclusive practice. When divergent differentiation practices were used, the motivational and behavioral outcomes of gifted students were reported to instead be affected positively. Practice that motivates students better also better meets their needs and improves their wellbeing, according to the Self-Determination Theory of Deci and Ryan (2012). Based on the results of this review, educators and policymakers would be advised to implement divergent differentiation practices in inclusive education settings to affect the motivation and behavior of gifted students positively. Examples of advised practice are Differentiated Instruction (DI) (Lavrijsen et al., 2024; Mede & Sapan, 2022), and autonomy-supportive teaching (Reeve & Cheon, 2021). As educators report that divergent practices are much more difficult to implement in mixed-ability classrooms than convergent practices (De Neve et al., 2014; Smit & Humpert, 2012), this review

strengthens the perspective that a more critical issue standing in the way of implementing effective inclusive education seems to lie with unavailable resources and understaffing (Tomlinson, 2016), instead of within an inherent fault of the philosophy of inclusive education.

Further, in this review, the main factor that reportedly influenced underachievement of gifted students in inclusive classrooms was not differentiation policy, but rather classroom dynamics, mixed-ability peer relations, and policy around competitive classroom environment. Results suggest that if a non-competitive classroom environment is fostered in inclusive education settings, a large social pressure incentivizing gifted students to conform to lower academic class averages through intentional underachieving would disappear. Based on the results of this review, educators and policymakers would be advised to implement practice in inclusive classrooms that fosters a non-competitive classroom environment to lower the chance of gifted student underachievement. Examples of advised practice are cooperative learning practices like the LEARN Strategy (Vernon et al., 2020), and practice that fosters a growth mindset (Uluduz & Gunbayi, 2018).

Through compiling contemporary research on the subject of the motivation and behavior of gifted students in inclusive settings, I hope that this review can serve as a tool in the toolbox of those tasked with implementing inclusive education: a tool that aids them in identifying practices that truly embody the ambition of ‘education for all’.

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Attachments

Attachment 1

The separate search strings of each component before being combined by Boolean operators

Component	Search string
Gifted or Talented Students	*Gifted* OR Talent**
Inclusive or General Education Settings	*"Inclusive education" OR "Inclusive school" OR Inclusi* OR "general setting*" OR "general school*"*
Motivation or behavior	*Motivation* OR Engagement OR "Achievement Motivation*" OR Participation* OR Behaviour* OR Behavior**
Full search string	*(Gifted* OR Talent*) AND ("Inclusive education" OR "Inclusive school" OR Inclusi* OR "general setting*" OR "general school*") AND (Motivation* OR Engagement OR "Achievement Motivation*" OR Participation* OR Behaviour* OR Behavior*)*