

Article

Twice-Exceptional Students: Review of Implications for Special and Inclusive Education

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Abstract: The purpose of this article is to review recent literature on twice-exceptional students and consider implications for their education in the context of the trend towards increased inclusive education for students with disabilities. The review focused on teachers' experiences and perceptions and the school experiences of twice-exceptional students. Fifteen articles were reviewed, published between 2000 and 2020, selected according to a systematic protocol from two widely used online databases. Findings indicated that the implications that need to be considered were the importance of teacher preparation, the need for a continuum of special education interventions, the need for collaboration with parents and specialists, and teachers needing to focus on developing strengths as much as remediating difficulties. It was concluded that twice-exceptional students can be taught effectively in inclusive education settings as long as they are able to access appropriate strategies and programs from the fields of special education and gifted education.

Keywords: gifted; twice-exceptional; special education; teachers; students



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1. Introduction

The worldwide trend toward inclusive education has focused on students with a wide range of disabilities being educated in mainstream schools but has so far overlooked those who have various gifts or talents in addition to their disabilities. It is relatively easy to identify gifted and talented students whose ability is reflected in high performance in various measures of educational achievement or in a range of artistic or other types of creative activity. However, identification of a sub-set of this group, who also have various types of disabilities, is more difficult. These are students who are considered to have dual or multiple exceptionality, or are termed gifted learning disabled, or are referred to by the concept of twice-exceptional [1]. These students have been defined as follows:

Twice-exceptional learners are students who demonstrate the potential for high achievement or creative productivity in one or more domains such as math, science, technology, the social arts, the visual, spatial, or performing arts, or other areas of human productivity and who manifest one or more disabilities as defined by federal or state eligibility criteria [2].

Students are considered twice-exceptional when they are identified as gifted or talented in one or more areas while also having a learning, emotional, physical, sensory, or developmental disability [3,4]. This includes students with various cognitive disorders and learning difficulties, sensorimotor disorders, autism or Asperger's syndrome, ADHD, or social maladjustment [5].

A useful model for twice-exceptional children highlights the relationship between disability, socio-cultural environment, and abilities [6]. The features of this model highlight the developmental nature of giftedness, or potential for talent or achievement, rather than achievement being the focal point of giftedness. The model contributes to the understanding of twice-exceptionality by not defining giftedness as being only intellectually or academically based, but by incorporating multiple areas of giftedness [6].

In many cases, in twice-exceptional students, ability is partially or fully dominated by any disabilities, which contributes to the risk of marginalization, stereotypical treatment, and exclusion from groups of students considered gifted and talented. For those students identified as twice-exceptional, it has been suggested that their education should be carried out using programs designed for the gifted, with the simultaneous use of methods for working with children with learning difficulties or disorders [7]. Although not all twice-exceptional students exhibit lower levels of academic performance, it is likely that, compared to gifted children who do not have any difficulties, their abilities will be less obvious.

1.1. Gifted and Talented

Typically, gifted and talented education is not considered to fall within the realm of special education, but in order to examine education for twice-exceptional students, aspects of this need to be clarified. For many years, there have been ongoing debates about various issues such as who the gifted are and who the talented are, and how do we meet the needs of gifted and talented children? [8]. What makes giftedness? How do we develop it in young people? [9]. There is also a lack of agreement in defining the concepts of being gifted [10] and talented [11]. This may be due to the different contexts within which these concepts are explored, because giftedness may manifest in a variety of forms [12]. Morelock found that in the United States, such questions have developed into such a controversy that there are those who advocate totally doing away with the word “gifted,” which they see as an elitist concept and, instead, talking about “talent development” for all children. Along this line of thought, one might conclude that whatever child performs above the average level of his or her age peers (no matter how poorly those age peers perform) in some area that is culturally valued (no matter what it is) is “gifted” [8] (p. 4).

Gagné [11,13] underscored the fact that the words “gifted” as well as “talented” are often interchangeable when used by experts, and suggested that giftedness is nothing more than the existing potential within a person, which can be turned into talent (advanced abilities or high achievements) according to the individual’s environment. This view may be especially useful when considering the education of twice-exceptional students.

1.2. Aim

The aim of this article is to review recent literature on the education of twice-exceptional students. The following questions guided the review:

- What research methodologies were used in the studies?
- What are teachers’ experiences and perceptions regarding the education of twice-exceptional students?
- What are the school experiences of twice-exceptional students?
- What are the implications for the education of twice-exceptional students?

2. Methods

2.1. Eligibility Criteria and Search

A systematic review of recent literature was conducted using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) protocol [14]. Eligible studies were limited to scholarly, peer-reviewed articles published in English between 2000 and 2020. Publication types comprised empirical research published in scholarly academic journals. Data sources were two widely used electronic databases covering the areas of education, specifically ProQuest and SAGE Journals Online. In each database, an initial search was performed against article abstracts using the search term “Twice Exceptional” AND “Twice Exceptional Education” AND “Gifted Learning Disabled” AND “Dual or Multiple Exceptionality.” The search was concluded in December 2020. The initial search results are summarized in Table 1.

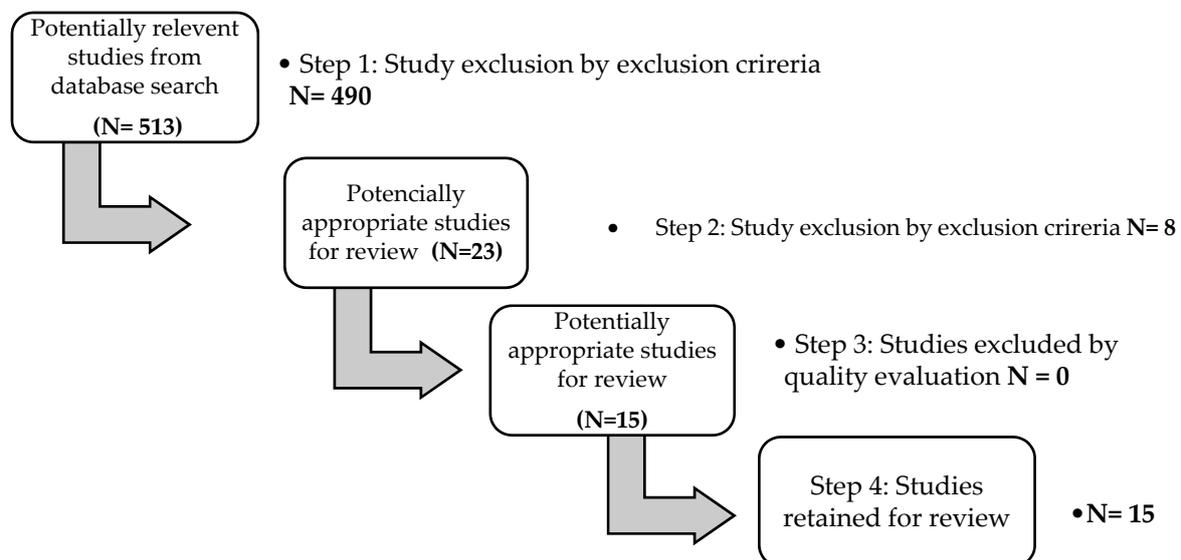
Table 1. Search Parameters and Initial Results.

Search Terms	Database	Research Limiters	Hits
"Twice-Exceptional" AND "Twice Exceptional education"	ProQuest	Scholarly (peer reviewed) journals Published date: 2000–2020	192
	SAGE Journals Online	Journals: Journal for the Education of the Gifted; The Gifted Child Quarterly; Journal of Advanced Academics; Gifted Education International	321
"Gifted Learning Disabled" AND "Dual or Multiple Exceptionality"	Total	Date range: 2000–2020	513

2.2. Selection

The selection process is presented in Figure 1. Screening criteria that guided the selection of articles from the initial list of studies for possible inclusion were:

1. Studies published in English between 2000 and 2020 were retained.
2. Studies published in scholarly journals were retained; those published in non-indexed or predatory journals, trade journals, or magazines were rejected.
3. Only studies in which the major focus was on the education of twice-exceptional children were retained.
4. Only articles that included empirical studies, either qualitative, quantitative, or mixed methods, were retained.
5. The quality of articles was judged on criteria that focused on clarity of purpose, participants, methods, results and conclusions, and significance within the field [15], and only studies of high quality were retained.

**Figure 1.** Article selection flow diagram.

Step 2 yielded 23 articles (see Figure 1). These were read, and after assessing for eligibility, eight articles were eliminated because they did not address the research questions. Step 3 involved considering the remaining 15 articles, which were assessed using the quality criteria listed above. All 15 studies were considered of sufficient quality to include in the review.

2.3. Data Collection and Analyses

Data extracted included research purpose, participant characteristics, research design, and key findings. Extracted data were stored in a database indexed by article. In addition, complete Findings/Results, Discussion, and Conclusions sections of each article were extracted and stored in a database. These were then subjected to thematic analysis in accordance with the research questions. The analysis focused on the abstracts, research goals, research samples, results, conclusions, and recommendations. Findings were summarised and presented in Tables 2 and 3.

Table 2. Teachers' experiences with twice-exceptional students.

Author/Date Reference	Country	Research Purpose	Methods	Participants	Findings
Bianco, Leech (2010) [16]	USA	Exploring differences among special education teachers, general education teachers, and gifted education teachers on their perceptions of students with disabilities and their willingness to refer them to a gifted and talented program.	Mixed methods	52 special education teachers, 195 general education teachers, 30 gifted education teachers	Referral recommendations for gifted services were influenced by teacher preparation. Research showed significant differences among teacher groups. When compared to teachers of gifted students and general education teachers, special education teachers were least likely to refer students with and without disabilities to a gifted program. The qualitative analysis of special education teachers' comments revealed their focus on students' weaknesses across conditions, even when referring the profiled student for gifted services. Special education teachers frequently wanted IQ data to help them determine whether the student was indeed gifted.
Rowan, Townend (2016) [17]	Australia	Teachers' evaluations of their preparedness to teach with regard to a range of areas directly tied to the education of gifted and twice-exceptional students.	Quantitative	971 early career teachers	Teachers felt inadequately prepared for teaching students with diverse abilities, supporting students with disability, and communicating sensitively with parents.
Wormald (2011) [18]	Australia	Investigating teachers' knowledge of gifted learning disabled students.	Mixed methods	Teachers and school counsellors	Schools were not able to identify gifted learning disabled students and were not meeting their specific educational needs. It was suggested that teachers exhibited inconsistent knowledge about these students and demonstrated a lack of understanding of how these students are affected by what the teachers do in the classroom.
Foley-Nicpon, et al. (2013) [19]	USA	Determining educational professionals' familiarity with gifted education, as well as knowledge and awareness about twice-exceptional students.	Quantitative	317 educators, psychologists familiar with gifted education	Results indicated that educators were more familiar with standards within their specific area of expertise (e.g., gifted or special education) and that fewer professionals were familiar with the use of Response to Intervention with twice-exceptional children. Gifted education professionals had significantly more knowledge and experience with twice-exceptionality than did professionals in other domains.

Table 2. Cont.

Author/Date Reference	Country	Research Purpose	Methods	Participants	Findings
Šuligoj (2014) [20]	Slovenia	Examining teachers' perceptions about specific characteristics of twice-exceptional students.	Qualitative	3 teachers	Teachers were able to recognize mostly emotional and social characteristics of twice-exceptional students. Interviewed teachers thought it more important to eliminate defects, rather than develop talents but encouraged their students to develop their talents and allow them to demonstrate their knowledge in the classroom, as well as participate in school activities.
Schultz (20120) [21]	USA	Exploring the perceptions of parents, teachers, and guidance counsellors regarding the participation of twice-exceptional students in Advanced Placement and for college credit classes.	Qualitative	12 teachers 12 parents 6 guidance counsellors 6 college students	Teacher and guidance counsellor participants indicated that some twice-exceptional students were capable of attaining success in more challenging courses but lacked the confidence and support to take risks. Teachers and guidance counsellors reported that these students could not perceive their role beyond that of a special education student, primarily because feedback they received focused on their weaknesses.
Missett et al. (2016) [22]	USA	Understanding how teacher expectations about a gifted student with an emotional disability influenced his instructional choices.	Case study	1 teacher	Teacher instructional choices were directed almost exclusively toward features of student disability and remediation rather than toward evident strengths and their development.
Mann (2006) [23]	USA	Examining and understanding teaching strategies that are effective for students with spatial strengths and verbal weaknesses.	Mixed methods	5 Teachers	The structure of classroom activities and support system at a high school for students with learning differences promotes productivity and a sense of accomplishment in gifted students with spatial strengths and verbal weaknesses. Teachers emphasized understanding individual student strengths and developing awareness of their current levels of functioning. There was consensus among all participants that no one strategy was sufficient since wide range of student learning styles meant it was essential to teach to each student's area of strength.

Table 3. Twice exceptional students' experience of education.

Author and Date	Country	Research Purpose	Methods	Participants	Findings
Willard-Holt et al. (2013) [24]	Canada	Investigating the perspectives of twice-exceptional students on learning strategies that have been recommended for them in the literature.	Mixed methods	Students age from 10 to 23 years, twice-exceptional students	Findings indicated that participants perceived that their overall school experiences failed to assist them in learning to their potential, although they were able to use their strengths to circumvent their weaknesses. Teachers were considered to be essential in developing and implementing strategies to create and maintain favourable learning environments for twice-exceptional students.
VanTassel-Baska et al. (2009) [25]	USA	Exploring the academic and affective profiles of gifted students who were classified under the five prototypes of: low-income White students, low-income African American students, low-income other minority students, high nonverbal and low verbal students, and twice-exceptional students.	Qualitative	Teacher, student, and parent.	The twice-exceptional students' vignettes and resulting themes reveal more negative factors at work than positive ones. Low motivation, hypersensitivity, lack of organization skills, negative behaviours, and lack of teacher accommodations for disabilities were the negative factors.
Wu et al. (2019) [26]	Canada	Exploring the learning experiences of highly able learners with ASD.	Case study	Two fifth-grade students	Supportive school context emerged as the core category that facilitated positive learning experiences among participants.
Wang (2015) [27]	China	Investigating academically achieving twice-exceptional students' perceptions of their academic self-concept and academic self-efficacy.	Qualitative	6 students age 13–15	Twice-exceptional students struggled with some subjects that required memorizing ability and reading skills, but they seemed to possess positive academic self-concept and academic self-efficacy that empowered their academic achievement.
Townend, Pendergast (2015) [28]	Australia	Measuring academic self-concept of twice-exceptional students, to explore their school experiences with teachers, and to explore the relationships between the two.	Mixed methods	Three twice-exceptional students	Students perceived teachers as highly important in their lives, and that interactions with teachers were essential for their sense of well-being and achievement at school. Participants also implied that feeling at an intellectual disadvantage led to their lack of participation in the classroom.
Ng et al. (2016) [29]	New Zealand	Understanding the transfer process from the participant's perspective.	Qualitative	Three twice-exceptional students	The way in which the twice-exceptional students experienced transfer influenced the development of their personal capabilities as learners in the education setting.
Mayes (2014) [30]	USA	Understanding of the perceptions and experiences of twice-exceptional African American students and their interactions with school counsellors.	Qualitative	8 twice-exceptional students	Findings revealed that students' special education status negatively impacted their relationship with peers, educators and school counselors.

3. Results

Six articles reported on qualitative studies, five on mixed methods studies, two on quantitative studies, and two on case studies. Eight of the 15 articles were found to focus mainly on teachers' experiences and seven focused mainly on students' experiences. Results are reported for each of the research question below.

3.1. Methodological Approaches Used

Most of the studies were conducted simultaneously with teachers and students. Six of the analysed studies were conducted using a qualitative approach, which made it possible to gain access to data on students and teachers experiences in the context of complex environmental, situational, and structural conditions.

Questionnaires and rating scales were used in both of the studies that used a quantitative research. Five of the studies used a combination of qualitative and quantitative procedures and two used case study methodology.

The size of the research samples ranged between 971 teachers in one quantitative study to just one teacher in one of the case studies. Most of the studies used purposive sampling, so samples may not have been representative. In some studies, the knowledge obtained concerns merely the analysed phenomenon in the specific context involved which may not be generalisable to wider populations [20,22,26,28]. Therefore, interpretation of the findings of the studies is limited to drawing tentative implications that will need to be investigated by further research [31–33].

3.2. Teachers' Experiences and Perceptions of the Education of Twice Exceptional Students

Of the eight reviewed articles that focused on teachers' experiences, four [16–19] focused on teachers' preparation and two on their relevant knowledge [18–20], with three concerned with their experiences in general [21–23]. The results are shown in Table 2.

The studies that were conducted among teachers found that, if they had undertaken appropriate courses, they were considered more likely to be successful in meeting the needs of gifted students [16,34]. It was reported that effective work with twice-exceptional students requires knowledge about their abilities, their diversity, and indicators that will guide teachers in the identification and use of appropriate teaching methods. Some analysed studies showed that teachers had only passing familiarity with, or were not aware of, twice-exceptionality [17,18]. It can be inferred that a misunderstanding of twice-exceptional students may result in a lack of appropriate identification of gifted individuals, and thus a reduction in the effectiveness of the teacher's work. It appears that teachers' competencies, positive attitudes, and appropriate preparation to work with gifted students are necessary but not sufficient to ensure their educational success, as much depends on the school environment and culture that they therefore need to take into account [20,23,26,29].

Two studies reported that teachers tend to focus more often on students' weaknesses than on their strengths [16,22], whereas another [23] reported that "teachers emphasize understanding individual student strengths and developing an awareness of their current level of functioning" [p. 117]. In most of the studies, it was apparent that there was less emphasis on developing students' strengths than addressing their weaknesses.

It was reported that experience, knowledge, style of working and understanding of twice-exceptionality largely depended on teachers' preparation [16–19]. In addition, collaboration between various school staff was considered essential [35], as mentioned by Foley-Nicpon et al. [19], who reported that teachers considered that twice-exceptional students need support from both gifted education and special education staff, but that gifted education professionals were considered to have a better understanding of twice-exceptionality in general.

3.3. Twice-Exceptional Students' Experiences of School

Findings from several studies (see Table 3 indicated that students considered that their school experiences had failed to help them reach their potential [24,25,27,30].

In some studies, students' statements suggested that their school environments were flawed. For example, Wu et al. [26] found that "Many twice-exceptional students have reported dissatisfaction in their overall school experiences as they often receive services focusing only on remedial intervention rather than on a more comprehensive program for fostering their strengths while supporting areas of challenge" (p. 235). This state of affairs may be the result of several factors. For example, teachers who were not exposed to courses and supervised practical experiences about the unique characteristics and needs of twice-exceptional students were more prone to bias and misconceptions concerning these students [36,37]. In fact, teachers were considered an essential key to creating and maintaining favourable learning environments for twice-exceptional students [24,28].

The importance of providing twice-exceptional students with adequate support and help with difficulties related to their disabilities is made clear in most of the studies. One study reported how twice-exceptional students experienced the transfer from elementary to high school influenced their personal capabilities as learners [29]. The complexity of twice-exceptional students is illustrated by a quotation from one of the participants' statements in the study conducted by Reis et al. [38], "She often felt as if she were two different people in the same body: one who was competent and bright who was inside, and another who blocked the smart person inside from communicating" (p. 472).

3.4. Limitations

The limitations of the review must be considered when interpreting its findings. Only articles in English were included, and those within a specific time period of 20 years considered, which limited the number of studies that were reviewed. The 15 articles reviewed comprised mainly studies that were based on purposive sampling and qualitative methodology, suggesting that implications from their findings must be regarded as tentative until confirmed by further research.

Several specific gaps in the literature were identified. For example, "The literature reveals the gap in research associated with the unique aspects of academic self-concept of twice-exceptional students" [28] (p. 40). In addition, "... gifted students with emotional and behavioural disabilities have been overlooked in the twice-exceptional literature" [22] (p. 28). Additionally, "... research on twice-exceptionality and how school counsellors can support twice-exceptional students is limited" [30] (p. 133). Future research should address these gaps and include a wider range of teachers and parents of students with twice-exceptionality, as well as different types of school settings.

4. Discussion

This review synthesized findings from 15 articles that were published in English in peer-reviewed journals from 2000 to 2020 on students' and teacher's experiences concerning twice-exceptionality. Students' experiences in school were found to depend on many factors, including their type of disability. The review highlighted factors determining the effectiveness of education for twice-exceptional students, including the need for teachers to have a thorough understanding of the needs of such students, as well as knowledge of the skills, strategies, and programs from the fields of special education and gifted education that are most effective in facilitating their development [39–41].

It was reported that, in order to enable twice-exceptional students to make appropriate progress, the primary focus should be on developing their skills and using their strengths [5]. Therefore, teachers must improve their professional competences and be aware of the importance of the school culture and environment in which they operate. It is clear that the needs of twice-exceptional students are best supported when special educators, gifted education teachers, and parents collaborate effectively [42].

Overall findings of the review emphasise the importance of teacher preparation, the use of evidence-based strategies, the need for teachers to focus on developing strengths just as much as remediating difficulties, and the availability of a continuum of special education interventions. This is the approach suggested in a model that promotes com-

bination of best practice in both special and inclusive education [41,43]. A key aspect of this model is that children with disabilities are placed in the most appropriate settings, from mainstream classrooms through special classes to special schools, throughout their education. Therefore, consistent with this model, it is clear that twice-exceptional students can be taught effectively in various forms of inclusive education settings as long as they are able to access appropriate strategies and programs from gifted education [39,40] and special education [41–44].

This has implications for teacher preparation, the teaching strategies to be used, and the support organised by schools. First, programs of initial teacher education and in-service education must address the limited knowledge of twice-exceptional students that was reported in the studies. These programs need to extend their work on children with disabilities, gifts, and talents to include the education of twice-exceptional students. This should involve providing knowledge and skills for identifying twice-exceptional students, working with colleagues and other professionals to assess and plan programs for them, and on collaborating with parents to successfully implement these programs.

Second, teachers must learn to use a range of strategies, based on evidence-based practices from gifted education and special education, to cater for the range of different learning styles of twice-exceptional students. Teachers must focus on building students' confidence levels and developing their strengths, as well as remediating their weaknesses.

Third, schools need to provide organisational structures that support teachers in implementing strategies such as Universal Design for Learning, Individual Education Programs, curriculum differentiation, and various other accommodations for twice-exceptional students. Most importantly, schools need to focus on providing favourable learning environments and supportive school contexts in which positive attitudes towards inclusion embrace the celebration of diversity, so that twice-exceptional students feel supported and can achieve optimally at school.

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