



# Interactions Between Teachers and Students with Autism Spectrum Disorder in Mainstream Secondary Education: Fundamental, yet Under-Researched

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## Abstract

This study aimed to identify which aspects of teacher-student interactions contribute to a successful inclusion of students with autism spectrum disorder (ASD) in mainstream secondary classrooms. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were followed. Eight studies fulfilled our criteria, and we identified teacher-related and student-related themes. Most of the included studies did not focus on interactions between teachers and students with ASD, but on requirements that could influence these interactions. Teachers often seemed to infer the needs of students with ASD during their interactions, which, as we illustrate, may not always be in line with their actual needs. We discuss the implications of this gap in the literature and how to bridge this gap.

**Keywords** Inclusive education · Teacher-student relationship · Adolescents · Students' needs · Teachers' needs

## Introduction

One of the main goals in education is to leave no student behind. This particular goal can be traced back to 1994, where the principle of inclusion and the aim to provide “mainstream” schooling for all students was adopted by the Salamanca Statement and Framework for Action on Special Needs Education (UNESCO, 1994). Recently, the international commitment to inclusive education was reaffirmed in the Sustainable Development Goal 4—also known as SDG4—in the Incheon Declaration and Framework for Action. The main goal is to “ensure inclusive and equitable quality education and promote lifelong learning opportunities for all” by 2030 (UNESCO, 2015, p. 7). As a consequence, there is currently a worldwide trend to include the

majority of children within mainstream education, where all children—including those with disabilities—are taught in the same classroom.

The implementation and success of inclusive education relies heavily on teachers, and especially on their interaction with students. The teacher-student interaction positively influences students' adjustments, engagement, and overall feelings toward school when teachers appear enthusiastic about teaching, show they care by getting to know students' interests, and treat them as equals (Alder, 2002; Breault, 2013; Smith & Schmidt, 2012). Moreover, researchers have found that the interaction between teachers and students has an impact on student's learning trajectories, which are not only defined by student and teacher characteristics, but also by the variability within those moment-to-moment interactions (Steenbeek et al., 2012; Van der Steen et al., 2019). However, teachers often struggle to divide their time to interact with their students during lessons and spend a considerable amount of time working on their own even though receiving instructions during interactions is essential for their learning (Van der Worp-van der Kamp et al., 2018).

One of the most common and still augmenting types of Special Educational Needs (SEN) is autism spectrum disorder (ASD). The most recent report from the Centers for Disease Control and Prevention from the USA shows that 1 in 44 children are diagnosed with this developmental

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disorder (Centers for Disease Control & Prevention, 2021). Among the defining characteristics of individuals with ASD are their difficulties with communication and social interactions (American Psychiatric Association, 2013). Although research has found that teachers feel positive about the inclusion of children with ASD in mainstream education (Garrad et al., 2019; Segall & Campbell, 2012), both parents and teachers are concerned about their issues in social interactions and (sometimes) behavioral problems (Azad & Mandell, 2016). To provide adequate, tailored support for students with ASD within mainstream education, teachers have expressed several needs. For instance, primary school teachers in the study of Van der Steen et al. (2020) emphasized their need to collaborate with other specialists, receive suggestions for their classroom instructions, improve their confidence during their contact with students with ASD, and to receive tools to stimulate the communicational and social skills of these students. This is also in line with other studies where teachers expressed a wish to receive more training focused on ASD to increase their confidence (Garrad et al., 2019; Helps et al., 1999; Lindsay et al., 2013; Zambrano & Orellana, 2018). Special (needs) education or autism-specific courses are often missing in teachers' education (Devi & Ganguly, 2022). Therefore, some teachers may feel unprepared or not confident enough to meet these students' educational needs. For instance, a recent study found that 62.9% of the teacher participants from Bosnia and Herzegovina agreed or strongly agreed that it was unfair to be asked to teach children with ASD in their mainstream school (Memisevic et al., 2021). Furthermore, 54.3% of these teachers believed that *only* teachers with special education training were able to help students with ASD in class (Memisevic et al., 2021). It is therefore not surprising that teachers report less closeness and more conflicts in their relationships with students with ASD (Blacher et al., 2014; Prino et al., 2016).

The education of students with ASD can be particularly challenging for both teachers and students in mainstream secondary classroom settings. For students with ASD, the school environment can be filled with noise and can feel disorganized, which makes their daily school experience stressful and overwhelming (Aubineau & Blicharska, 2020). Furthermore, as opposed to the primary school environment, students' interactions in secondary classroom settings are usually with multiple teachers, who have different teaching strategies and personal characteristics (Able et al., 2015). In addition, the teacher-student interaction can be more time-restricted, meaning that secondary school teachers have less time to get to know what their students' interests are, which has proven to be fundamental in growing a caring relationship (Alder, 2002). Therefore, it is particularly valuable to look into these interactions, to determine what works and

what does not, so that this can help teachers in secondary classroom settings to structure their interaction in such a way that mostly benefits the student with ASD.

A vast amount of literature on the inclusion of students with ASD has focused on the primary school or preschool setting. Less is known about the educational experiences of students with ASD in mainstream secondary classroom settings (Saggers, 2015). Therefore, this study answers the following research question: Which aspects of teacher-student interactions contribute to a successful inclusion of students with ASD in mainstream secondary classroom settings? We aim to provide a meaningful synthesis of the literature by identifying what we currently know about the interactional processes that promote the inclusion of secondary school students with ASD. Our review covers both the perspective of teachers and students. The results of this study could guide future studies on teacher-student interactions in secondary classroom settings, and could also benefit policy makers and especially teachers, who have daily school interactions with this target group, thereby influencing students' learning and school experiences (Alder, 2002; Breault, 2013; Smith & Schmidt, 2012; Steenbeek et al., 2012; Van der Steen et al., 2019).

## Method

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were followed to develop the current systematic review (Moher et al., 2009). In accordance with the guidelines, the protocol was registered in the PROSPERO database (CRD42041235415). We made sure no other review on the same topic was registered to avoid duplication. We included studies from multiple databases: EBSCOhost COMPLETE (including ERIC, MEDLINE, and PsycInfo) and Web of Science. Both Endnote and Rayyan (Ouzzani et al., 2016) were used to manage references, delete duplicates, and to screen titles and abstracts of potentially relevant papers. The Mixed Methods Appraisal Tool (MMAT) was employed for quality appraisal, given that we considered both quantitative, qualitative, and mixed methods studies (Hong et al., 2018).

## Inclusion and Exclusion Criteria

Studies were included if they adhered to the following criteria: (a) they were empirical studies focused on students (regardless of their gender) with an autism spectrum disorder (ASD) diagnosis. This also included students diagnosed with Asperger's syndrome, high-functioning autism, or pervasive developmental disorder-not otherwise specified, according to the past DSM-IV criteria; (b) studies took place between 1994 (year of The Salamanca Statement and Framework for

Action) and 2021; (c) the age range of the students was 12 to 18 years old, or 7th to 12th grade in secondary school; (d) data focused on the interactions between students with ASD and their teacher(s), using either a quantitative, qualitative, or a mixed methods approach; (e) papers were written within the context of regular/normal/mainstream education; (f) the papers were published in peer-reviewed journals; and (g) the papers were fully written in the English language. Studies reporting on multiple educational levels were only included if it was possible to distinguish which data were collected in secondary classroom settings, i.e., if the article explicitly mentioned “a middle school teacher emphasized...” or if the participant’s pseudonymized data indicated their age or educational level: “Pseudonym of participant, aged 14.1.”

Studies were excluded from the review if: (a) participants were children with ASD in preschool, primary school, or higher education; (b) they solely focused on participants in distinct special educational settings, and/or focused on special education teachers; (c) these were theoretical papers, secondary research or non-empirical studies; (d) papers were single-case studies, and (e) participants had severe cognitive impairments, or were not able to communicate verbally, which would highly influence the nature of teacher-student interactions.

### Search Strategy

Searches in EBSCOhost COMPLETE (including ERIC, MEDLINE, and PsycInfo) and Web of Science were conducted between December 2020 and January 2021. Under the “Advanced Search” and the “All Text” option, we searched the following Boolean/Phrase:

Autism Spectrum Disorders OR ASD OR Autis\* OR Asperger OR High Functioning Autism OR HFA OR PDD-NOS.

AND Teacher-Student Interaction\* OR Teacher-Student Relation\* OR Teacher-Student Communica\* OR Teacher-Student Conversa\*.

We placed two restrictions on our searches. First, we established a date restriction, as the year 1994 marks a shift from “integration” to “inclusion.” In the years that the educational system focused on integration, the main goal was to avoid segregated education of students, by focusing on their placement (Pijl & Meijer, 1991). Since 1994 (the year of the Salamanca statement), the focus has shifted to inclusion, which is a process in which not only the presence or placement of students is taken into consideration, but also their active participation and educational achievements (Ainscow & Miles, 2008). Hence, studies prior to 1994 might focus on factors that lead to the “integration” of our target group, instead of “inclusion.” Second, we searched only in scholarly (peer-reviewed) journals. It should be noted that although we only included papers written in the English language,

we did not limit our search to the location of the studies, since we were interested in identifying commonalities in the key interactional processes that benefit inclusive education of students with ASD, regardless of their geographical placement. Since our main focus was the interaction between teachers and children with ASD in mainstream secondary classroom settings, we manually screened the papers as to whether they indicate the age of the students or the educational level. We also looked into the reference lists of the selected articles to identify further studies (see below).

### Study Selection

References obtained from all databases were exported to Endnote. For the removal of duplicates, we followed Bramer et al. (2016) de-duplication method, which only required modifications on Endnote’s settings. While this method reduces error rates, assessment was also done manually, to ensure no significant papers got lost in the process. Once the de-duplication process was completed, references were exported to Rayyan, which is a free web and mobile app designed for systematic reviews (Ouzzani et al., 2016). To verify which papers met the inclusion criteria, the title and abstracts of all papers were screened independently by two researchers, using the “Blind On” feature in Rayyan (Ouzzani et al., 2016). The only disagreements that occurred at this stage were due to one of the researchers missing information (i.e., the age of participants). To solve this, researchers carefully revised the abstracts, and disagreements in the conflicted papers were resolved through discussion until 100% agreement was reached on which papers to include for a full read.

### Data Analysis

The data analysis consisted of three phases. In the first phase, general information of the studies was extracted; in the second phase, the risk of bias was assessed with the Mixed Methods Appraisal Tool (MMAT) version 2018; and in the third phase, we performed a thematic synthesis.

In the first phase, data extraction was carried out independently by two researchers. No disagreements were found. The extracted information consisted of (1) characteristics of the study, i.e., citation, country, context/setting, methodology, and technique(s) of data collection and (2) characteristics of the participants, i.e., age (in case the participants were students), any additional information with regard to the ASD diagnosis (if available), and school grade.

We then used the Mixed Methods Appraisal Tool (MMAT) version 2018 for the quality assessment of each study (Hong et al., 2018). While there are several tools for the quality assessment of studies, the majority tends to assess one type of study design. The MMAT allows researchers to appraise the quality of five different

categories of studies: qualitative, quantitative randomized controlled trials, quantitative non-randomized, quantitative descriptive, and/or mixed methods studies. This tool has two screening questions (for all study designs) with regard to the clarity of the research questions and, whether or not the data sufficiently addresses those research questions (Hong et al., 2018). Subsequently, five questions are asked for each category of study design (i.e., are the findings adequately derived from the data?) to which the researcher(s) can answer with a “Yes,” “No”, or “Can’t tell” (Hong et al., 2018). If a study has a mixed method design, the researcher(s) must assess its different components in addition to the questions from the “mixed methods” section of the MMAT. The MMAT not only met the specific needs of this systematic review (given that we included empirical studies regardless of their study design), but also made the assessment more comparable by employing a single checklist for all types of studies that were included. As recommended by the authors of the MMAT, judgements were made independently by two researchers, and no study was excluded based on its quality (Hong et al., 2018). We provide the ratings of their design criteria (see Appendix, Tables 1, 2, and 3 (in SEM)).

Lastly, we used a thematic synthesis to integrate and present our findings. The core of this method is the development of “themes” or “thematic codes” from the selected studies (Thomas & Harden, 2008, 2012). Using this method, we were able to identify key themes from our studies that explored interactions between teachers and students with ASD in mainstream secondary classroom settings, and how this interaction enhances inclusive education. An “inductive” model for the generation of themes was followed. That is, themes were not a priori generated, as happens in deductive models (Thomas & Harden, 2012), but a posteriori.

According to Thomas and Harden (2008) a “thematic synthesis” consists of three different stages. First, a free line-by-line coding of the findings of included studies is needed. We looked for phrases related to teacher-student interactions within the main findings of our included studies and then associated these within a theme. Themes could be either from a student’s perspective (i.e., studies in which students are sharing their view on the interaction with their teachers), or they could be from a teacher’s perspective (i.e., studies in which teachers share about their interactions with students with ASD), and had to be mentioned in at least two articles. The second stage was to construct descriptive themes, which aimed to “develop and articulate relationships between the themes and associate conceptually similar themes with one another” (Thomas & Harden, 2012, p. 196). The development of analytical themes is considered as a third and final stage. Here, we aimed to provide (plausible) interpretations associated

with the interactional processes of our target group and their teachers.

## Results

### Study Selection

Our search in EBSCOhost COMPLETE (including ERIC, MEDLINE, and PsycInfo) yielded 726 articles. Our search in Web of Science resulted in 13 additional articles. After removing duplicates in Endnote, 664 papers were exported to Rayyan and manually screened by title and abstract. Based on our inclusion and exclusion criteria, 604 papers were excluded. The main reason for exclusion was that papers were not specifically targeting students with ASD (i.e., most papers were about children with SEN without specifying this further). A second reason for exclusion was that studies were focused on another educational level, such as preschool or primary education. Two independent researchers full-read the remaining 60 papers. They agreed that six papers fully met the inclusion criteria of the study. We identified two additional records through the reference lists of the six included papers. In total, eight studies were included for our thematic analysis (see Fig. 1 for the full process of study selection).

### Characteristics of Included Studies (n = 8)

A summary of the characteristics of the included studies can be found in Table 1. Five studies were published in the UK (62.5%), followed by two studies in Australia (25%), and one in the USA (12.5%). Three studies reported on students in multiple educational levels, three exclusively on secondary schools, and two on students enrolled in high school. Most of the included studies followed a qualitative methodology (75%), with only one study being quantitative and one other being a mixed method study. Semi-structured interviews were the mostly used method for data collection in the qualitative studies. Other methods used in these studies were focus groups, non-participatory observations, student diaries, drawings, and multiple participatory methods. Questionnaires were used in both the quantitative and mixed method study. In five studies, the perspectives of students with ASD were explored, while three papers focused on the perspective of teachers educating students with ASD. The diagnosis of the students with ASD was often not further specified, apart from one study that indicated that participants had Asperger’s syndrome. Although all articles focused on the secondary school level, the majority of studies (87.5%) did not specify

**Table 1** Characteristics of included studies

Reference	Country	Context/setting	Methodology	Technique(s) of data collection	Participants	Diagnosis	School grade	Age of the students
1 Able et al. (2015)	USA	Elementary, middle school and high school (Inclusive/mainstream education)	Qualitative	Six focus groups and one interview	34 teachers (18 mainstream secondary education)	N/A	N/A	Not mentioned
2 Danker et al. (2019)	Australia	High school (Five teachers taught in support units, nine in mainstream classes, the rest have taught in both)	Qualitative	Semi-structured interviews	20 teachers	N/A	N/A	Not mentioned
3 Dillon et al. (2016)	U.K	Mainstream secondary school	Mixed methods	Semi-structured interviews and self-report questionnaires	14 students with ASD and 14 students without ASD (control group)	ASD	Not mentioned	$M = 13.57$ ( $SD = .94$ )
4 Emam and Farrell (2009)	U.K	Primary and secondary mainstream schools	Qualitative	Semi-structured interviews and non-participant observations	Teachers of 17 students with ASD	ASD	2nd to 11	7–16 years old
5 Goodall (2019)	U.K	Primary and secondary schools,* (mainstream and alternative education provision)	Qualitative	Semi-structured interviews and participatory methods (tasks)	Seven male students with ASD	ASD	Not mentioned	13.10 to 16.4 years old
6 Humphrey and Lewis (2008)	U.K	Mainstream secondary schools	Qualitative	Semi-structured interviews, student diaries, and drawings	20 students with ASD	Asperger Syndrome and HFA	Not mentioned	11–17 years old
7 Humphrey and Symes (2010)	U.K	Mainstream secondary schools	Quantitative	Questionnaires: Social Support Scale for children and the My life in school checklist	40 students with ASD, 40 students with dyslexia, and a control group of 40 students without SEN	ASD	Not mentioned	$M = 13$ years, 9 months
8 Siggers (2015)	Australia	Mainstream high school	Qualitative	Semi-structured interviews	Nine students with ASD: seven boys and two girls	ASD	8th to 12th	Not mentioned

Only middle school and high school data and/or data of participants between ages 12 and 18 (7th–12th grade) are being analyzed from studies reporting on multiple contexts/settings or ages. These are marked in italics

\* Participants in this study were in an Alternative Education Provision (AEP). However, they reflect on their experiences during mainstream (primary and secondary) schools, which is why the study is included

**Table 2** Teacher-related themes

Author(s), year	Themes	Sub-themes
Able et al., 2015 Danker et al., 2019	1. Teachers' training and education	Knowledge of ASD Hands-on practice during pre-service education Time for training
Able et al., 2015 Danker et al., 2019 Emam & Farrell, 2009	2. Help from other professionals and parents	Consultation with other teachers and school staff Parents as a source of information Presence of a teaching assistant (TA) in the classroom
Able et al., 2015 Danker et al., 2019	3. Getting to know the student	
Able et al., 2015 Danker et al., 2019 Emam & Farrell, 2009	4. Teachers' practice	Getting the student engaged Classroom management Strategies for group-work Teaching strategies Incorporating the social aspect in teaching
Danker et al., 2019 Emam & Farrell, 2009	5. Teachers' emotions	

**Table 3** Students' themes

Author(s), year	Themes	Sub-themes
Dillon et al., 2016 Goodall, 2019 Humphrey & Lewis, 2008 Saggers, 2015	1. School environment	Calm and structured environment Small school/class size <sup>+</sup> School belonging <sup>+</sup>
Danker et al., 2019 Dillon et al., 2016 Emam & Farrell, 2009 Humphrey & Lewis, 2008 Humphrey & Symes, 2010 Saggers, 2015	2. Material and social support	Technology* TAs Getting "extra" support from the teachers
Dillon et al., 2016 Goodall, 2019 Humphrey & Lewis, 2008 Saggers, 2015	3. Didactic strategies and performance	Group-work Workload <sup>+</sup> Academic performance
Able et al., 2015 Danker et al., 2019 Dillon et al., 2016 Emam & Farrell, 2009 Goodall, 2019 Humphrey & Lewis, 2008 Humphrey & Symes, 2010 Saggers, 2015	4. Students' characteristics	Understanding others* Social and communicational skills Externalized behavior Adaptation and life skills* Self-acceptance of ASD Trusting others and feeling safe

Normal font = What both students and teachers wanted/needed/preferred for their interactions in the mainstream classroom

\*Themes based upon what teachers thought students needed for their interactions in the mainstream classroom

<sup>+</sup>Themes exclusively related to students' needs/preferences

the exact school grade of the participants, with only one study indicating that participants were in grades 8 to 12.

### Risk of Bias Within Studies

We assessed three types of designs within our included studies: qualitative ( $n = 7$ ), quantitative descriptive ( $n = 2$ ), and mixed-methods ( $n = 1$ ). All studies had

clear research questions or aims, and the collected data sufficiently addressed the research questions or aims, thereby fulfilling the MMAT criteria (Hong et al., 2018). Furthermore, all included studies in our review can be considered as being of good quality, meaning that they had clear research questions and/or aims, and that their study design was suited to address these questions. Moreover, the interpretations of the results are supported by the data. Further details on the quality

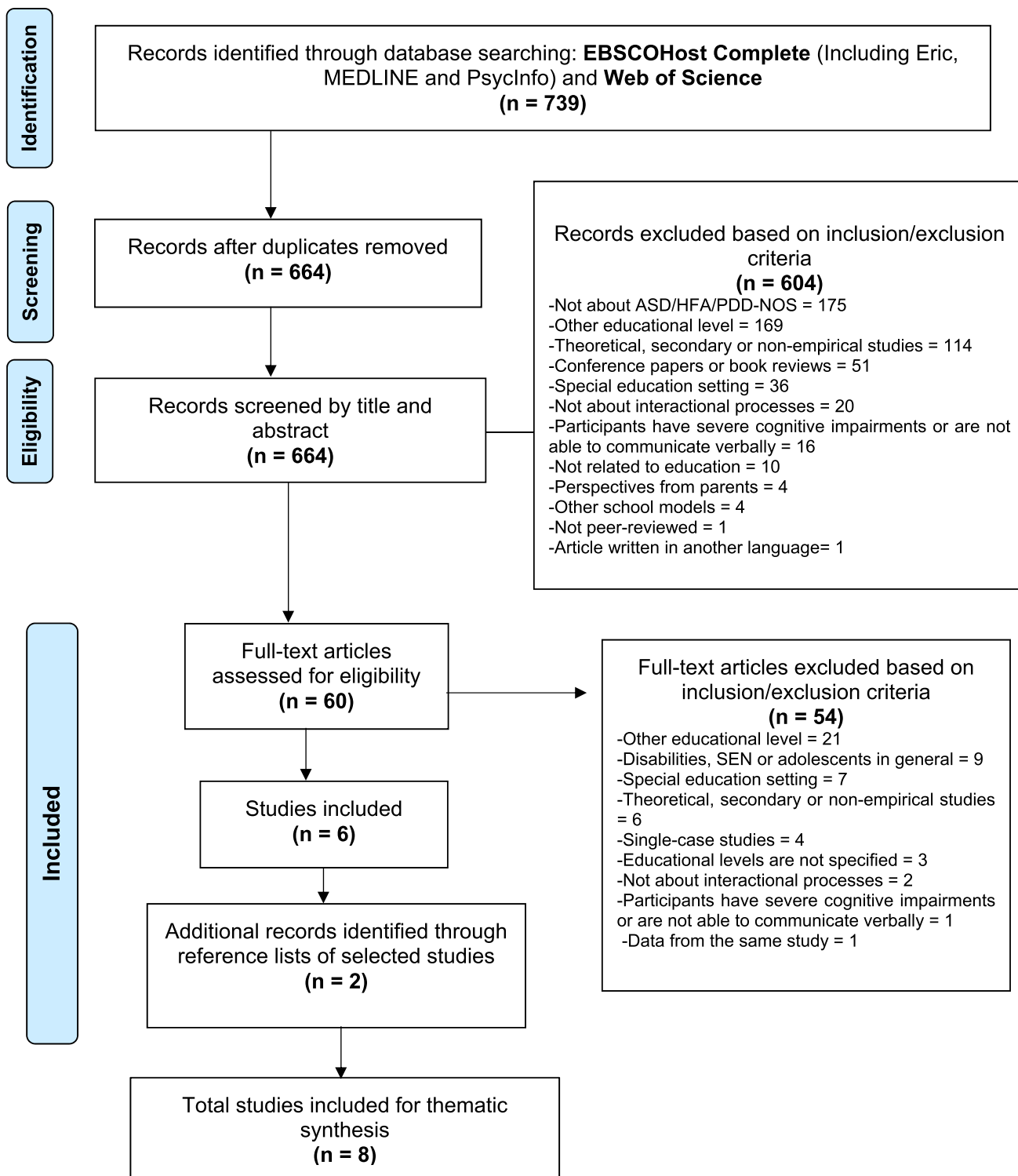


Fig. 1 Flow chart of the included studies

appraisal of the qualitative, quantitative non-randomized, and mixed-method studies can be found in the Appendix (in SEM).

### Synthesis of the Results

Through our analysis of the eight included studies, we identified several teacher-related themes and student-related

themes in teacher-student interactions.

## Teachers' Themes

From a teachers' perspective (Table 2), five themes concerning their interactions with students with ASD emerged: (1) teachers' training and education, (2) help from other professionals and parents, (3) getting to know the student, (4) teachers' practice, and (5) teachers' emotions. Further sub-themes were identified for some of the teacher-related themes.

## Teachers' Training and Education

### Knowledge of ASD

While having knowledge of ASD is not specifically related to the teacher-student interaction, secondary school teachers in the reviewed studies believed this helped to improve their interaction with this particular group of students. For instance, Able et al. (2015), argued that with this knowledge "teachers would be better equipped to fully include the student in the school and classroom culture" (p. 53), as this allowed teachers to learn more about the characteristics of individuals with ASD and their possible needs. Moreover, having knowledge about ASD could help teachers to better understand challenging behaviors they might come across, and make the appropriate adaptations to their classes (Danker et al., 2019). The studies did not specify what kind of knowledge would be helpful, or in what form this could be presented.

### Hands-on Practice During Pre-Service Education

Teachers in Able et al.'s (2015) study acknowledged how their pre-service education was mostly theoretical. Opportunities to obtain more practical knowledge, for example, by having one-on-one interactions with students with ASD, were largely missing (Able et al., 2015). According to teachers within this study, pre-service education should go beyond providing theoretical knowledge, but guide them through the application of this knowledge to gain more experience in *interacting* with students with ASD.

### Time for training

Teachers from one study acknowledged the positive effect courses and workshops had on their understanding of ASD and their teaching skills. However, they also emphasized

they did not have enough time for professional development (Danker et al., 2019).

## Help from Other Professionals and Parents

### Consultation with Other Teachers and School Staff

Teachers who previously taught the student with ASD were seen as a good source of consultation for the current teacher (Able et al., 2015), since previous teachers might have an idea on what works when interacting with the student with ASD. One of the teachers in the study of Danker et al. (2019) mentioned: "...the opportunity to go into another teacher's classroom and see how they're doing it...I think the more exposure you get to other people doing it gives you ideas, and you get to reflect" (p. 2931). The consultation of other school staff was also mentioned. They seemed helpful when planning the students' school schedule (Able et al., 2015). This is particularly important, as students with ASD often have a preference for structured and well-organized environments.

### Parents as a Source of Information

Parents could also be great allies for middle school teachers, especially if parents provide them with strategies that they know would work during the interaction with their children (Danker et al., 2019). A teacher from Able et al.'s (2015) study sums this up with the following statement: "parents know their children more than anybody else and when parents can provide helpful tips about what makes their child tick or not, that is so helpful" (p. 52).

### Presence of a TA in the Classroom

Emam and Farrell (2009) stressed that teaching assistants (TAs) have an important role in inclusive education: they are a source of safety for students with ASD, they deal with challenging behaviors, they provide support during classroom tasks, and they make sure the students finish their work. On the other hand, all these tasks might fuel the (wrong) impression that the student is the TA's responsibility, and not the teacher's (Emam & Farrell, 2009).

## Getting to Know the Student

Teachers in the reviewed studies indicated the need to get to know their students during their teacher-student interactions. This helps teachers to become aware of the student's strengths, which they can focus on to increase their sense of accomplishment (Danker et al., 2019). For middle and high school teachers, some "helpful hints" from parents of



the student with ASD (Able et al., 2015, p. 51) would ease the process of getting to know their students, especially information about their characteristics and educational needs.

## Teachers' Practice

### Getting the Student Engaged

To give students with ASD the opportunity to have an active participation in all classroom and school activities seemed important for the teachers in our review. As one teacher expressed, this “just shows that they [the students with ASD] are an important part of the school” (Danker et al., 2019, p. 2930). In order to get the student with ASD engaged, teachers should take into account students' interests during these interactions, give them the opportunity to learn by doing (hands-on activities), and make the lessons and activities meaningful for these students (Danker et al., 2019).

### Classroom Management

Teachers in the reviewed studies emphasized the struggle to meet the needs of students with ASD while also meeting the needs of their other students (Able et al., 2015; Emam & Farrell, 2009). As one teacher mentioned: “You have to remind yourself many times of the needs of the different pupils you have within the class...because it is easy to forget when you are targeting 30 kids and one of them has got a particular need...” (Emam & Farrell, 2009, p. 414). Thus, classroom management skills could help teachers to find time to interact with the student with ASD and provide them the support they need.

### Teaching Strategies

The wide variety of characteristics of students with ASD implies that not all students with ASD will benefit equally from the same teaching strategies. Thus, teachers could take advantage of having a repertoire of strategies to work and interact with the student with ASD. In Danker et al.'s (2019) study, several strategies were mentioned: establishing routines, teaching the students how to cope with anxiety, the use of positive reinforcements, and planning hands-on activities. Furthermore, students with ASD can benefit from the additional instruction and support from teachers during complex tasks (Danker et al., 2019).

### Strategies for Group-Work

Group work is not specifically related to teacher-student interactions, and can be challenging for all the parties involved (teacher, student with ASD, and peers). Yet, it was

seen as a good opportunity for students with ASD to interact with peers in the studies we reviewed. Careful planning is needed during group work, as having too many students working together can be distressing for the student with ASD. Moreover, the classmates assigned to the group of the student with ASD should be considered beforehand: “I have learned through trial and error that placing students with ASD in cooperative learning groups with peers who excel academically is best because those peers are more willing to make allowances” (Able et al., 2015, p. 51). It is essential to also allow students with ASD time to work on their own within the group (Able et al., 2015), so they can make their own contributions.

### Incorporating the Social Aspect in Teaching

As students with ASD have difficulties with social interactions, teachers expressed concerns on how to incorporate the “social” aspect in teaching. Teachers in the reviewed studies were unsure how and when to meet the social needs of students with ASD (Able et al., 2015), as the national curriculum sometimes places constraints on possibilities for teachers' adjustments (Emam & Farrell, 2009). As a result, teachers were hesitant to prioritize social interactions and teaching social skills during their interactions with the student with ASD (Able et al., 2015). However, teachers strongly believed that students with ASD need to be taught social skills to optimally interact with their peers (Able et al., 2015).

### Teachers' Emotions

Teachers from our review felt they needed to show empathy, patience, and acceptance of diversity during their interactions with students with ASD (Danker et al., 2019). Unfortunately, one study showed that there is an emotional distance between teachers and students with ASD due to the latter's typical ASD (social-interaction related or communication-related) characteristics and/or behavioral typicality's (Emam & Farrell, 2009).

### Students' Themes

From the students' perspective (Table 3), four themes emerged: (1) school environment, (2) material and social support, (3) didactic strategies and performance, and (4) students' characteristics. Further sub-themes were identified for each student-related theme. Interestingly, some of the students' themes were based upon *what teachers perceived* students with ASD needed or preferred in their interactions in mainstream school (i.e., understanding others). Other sub-themes were based on what *both* teachers

and students with ASD needed or preferred, such as a calm and structured environment. Only three sub-themes (small school/class size, school belonging, and workload) were exclusively mentioned by the students with ASD and not by their teachers.

## School Environment

### Calm and Structured Environment

Students with ASD struggled to cope with the chaotic, unpredictable, and noisy environment of mainstream schools (Goodall, 2019; Saggars, 2015). The noise, in particular, makes some students with ASD want to leave their class (Humphrey & Lewis, 2008). This was also supported by students with ASD from Goodall's (2019) study, where students indicated that they seek a calm environment to get away from the chaos: "sometimes I just went to the toilet to sit and breath in and out to try and relax and get away from all the noise and pressure" (Goodall, 2019, p. 24).

### Small School/Class Size<sup>+</sup>

In a couple of studies, a small school size/class size was seen as a positive attribute. According to students with ASD, teachers had a better opportunity to interact with them when schools and classes were smaller: "Cause (...) teachers know you and you can trust them" (Dillon et al., 2016, p. 225). Moreover, small classes felt as a great chance for students with ASD to be themselves and embrace their personal characteristics, as one student from Goodall's (2019) study expressed: "Smaller classes really do help...it helps make you feel more comfortable and able to be yourself" (p. 25). In addition, having a small class size prevented some distractions and helped students to focus on getting their work done (Goodall, 2019).

### School Belonging<sup>+</sup>

It was evident from the students' voices in our review that they had a strong desire to feel "they belong" in the mainstream school environment. Moreover, they felt "privileged" to attend a mainstream school and believed everyone had the right to do so (Humphrey & Lewis, 2008, p. 41). To have a sense of school belonging, it seemed necessary to receive an equal treatment from the school staff and teachers. Unfortunately, some studies showed that students with ASD felt they were being approached and treated differently than their peers (Humphrey & Lewis, 2008; Saggars, 2015), which can impact their sense of belonging.

## Material and Social Support

### Technology\*

Although material support is not directly related to teacher-student interactions, Saggars (2015) indicated that some students with ASD had issues related to handwriting and therefore suggested the use of technology to reduce the discomfort that handwriting represents for this group of students. Moreover, teachers from Danker et al.'s (2019) study believed that technology was beneficial for students with ASD, especially to help them increase their level of engagement during lessons.

### TAs

Students with ASD in the reviewed studies had mixed opinions about the presence of TAs. For some students, having additional support meant that their peers were more aware of the differences between them (Humphrey & Lewis, 2008). In line with this, some students with ASD felt that social support of TAs was "the worst thing ever" (Humphrey & Lewis, 2008, p. 39). Since this was mostly related to its visibility, Saggars (2015) suggests that additional support could be "delivered in "subtle" ways within the inclusive context" (p. 41). For other students, social support gave them a sense of calmness and allowed them to carry out their school work (Humphrey & Lewis, 2008). Observations from Emam and Farrell's (2009) study showed that some students with ASD enjoy the safety that TAs give them during their interactions in class. However, the authors also displayed some concern about how the mediation of the TA interfered with the teacher-student interaction (Emam & Farrell, 2009).

### Getting "Extra" Support from the Teachers

One study in our review found that students with ASD perceived the same level of support from teachers as their peers (Humphrey & Symes, 2010). While this might be positive for students with ASD who want their differences to be less attenuated when they interact with their teachers (Humphrey & Lewis, 2008), there are some students with ASD who benefit from additional support that teachers provide during one-on-one interactions. For instance, careful scaffolding makes it possible for some students with ASD to go on with their work and complete their school activities (Saggars, 2015). Clarity and consistency of the teacher's messages was also key: "It's better [to keep it] simple. Give out the information you need, not like a whole lecture on what you need to do" (Dillon et al., 2016, p. 226). Moreover, delivering only the essential information was preferred by students:

“When they just write loads on the board to copy...I don’t like that...If it gets too long it gets too complicated” (Dillon et al., 2016, p. 226). In sum, giving extra support during interactions and keep the instructions short helped to ease the work on the student with ASD.

To be an active listener, firm, fair, have a good sense of humor, and provide an organized classroom environment were among the characteristics that students with ASD pointed out themselves as strong qualities of their teachers (Saggers, 2015). Students with ASD especially valued interactions in which teachers showed they care for them and helped them toward their educational goals: “He’s trying to make us do well and pushing us forward” (Dillon et al., 2016, p. 225).

## Didactic Strategies and Performance

### Group-work

Although “group-work” is not directly related to teacher-student interactions, students with ASD in the reviewed studies voiced their preference for lessons that involved the whole class (Dillon et al., 2016). Some students with ASD advocated for more group work: “More group work would be fun...playing games in teams and raffles in class are fun” (Dillon et al., 2016, p. 226). However, the size of the group should be small, as one student remarked: “If there’s too many people in my group, they make noise and it puts me off...I like working in smaller groups with people I know” (Dillon et al., 2016, p. 226).

### Workload<sup>+</sup>

The workload teachers gave to students with ASD seemed to be a major issue for the students in the studies we reviewed. When reflecting about their time in mainstream classroom settings, students with ASD from Goodall’s (2019) study emphasized how they had “loads of work” (p. 21) to do during the lessons. Some activities would be stressful for students with ASD due to the amount of handwriting they required (Saggers, 2015). Problems with workload were not exclusive to their school-time but afterward as well: “Homework is pointless...Been at school all day, then you get more work in your own time” (Dillon et al., 2016, p. 227). As students have several classes with different teachers in secondary school, this led to more work for them to do at home: “they would give you way too much...every class would give you homework” (Saggers, 2015, p. 22).

## Academic Performance

Students with ASD believed their performance had an impact on the interactions with their teachers: “...If you work hard you do get a lot out of it, the teachers don’t shout at you” (Dillon et al., 2016, p. 225). In addition, they embraced their future with optimism when they performed good at school: “I am top of the class and doing very well and I’ve got a good future ahead of me and I’ve got a vocabulary...” (Humphrey & Lewis, 2008, p. 32).

## Students’ Characteristics

### Understanding Others<sup>\*</sup>

As students with ASD tend to take things literally (Humphrey & Lewis, 2008), teachers felt the need to adjust their language during the interaction with these students (Emam & Farrell, 2009). Teachers seemed to prefer that students with ASD are able to “read” others, and more specifically, what the teacher or peers are expressing and feeling (Able et al., 2015). Indeed, teachers in the study of Emam and Farrell (2009) highlighted how students with ASD often struggled to comprehend teachers’ and peers’ emotions or subtle messages, which complicated their interactions.

### Social and Communicational Skills

Some of the reviewed studies comment on the limited social and communicational skills of secondary school students with ASD. Students found it hard to know what to say during simple every-day interactions: “It’s just when somebody says hello, I sort of say the wrong thing...” (Saggers, 2015, p. 39). As a result, social interactions were stressful situations for students with ASD, as they struggled to properly carry on the conversation. It should be noted, however, that students with ASD tried hard to interact with others: “I often try to make friends with them...[but] they often just go against me” (Humphrey & Lewis, 2008, p. 35). Teachers were concerned about the social and communicational skills of students with ASD, and especially students’ lack of friendships (Danker et al., 2019). Moreover, teachers indicated that limited social skills prevented the students with ASD from expressing their educational and psychological needs. Knowing this seemed valuable for teachers to provide adequate support during teacher-student interactions: “He needs to be able to say these are my strengths and this is what I need help with” (Able et al., 2015, p. 49).

## Externalized Behavior

Some students with ASD were able to recognize feelings of anger, or signal when they would get aggressive in unexpected situations (Dillon et al., 2016), or when the mainstream environment was hard to cope with (Goodall, 2019). Management of challenging behaviors like this was also an issue for teachers. For instance, teachers from one study (Danker et al., 2019) highlighted how the externalized behaviors of students with ASD were “annoying and distracting” (p. 2928) during teacher-student interactions. Thus, strategies to deal with challenging behaviors during school interactions would be beneficial.

## Adaptation and Life Skills\*

Even though it is not related to teacher-student interaction, teachers in our reviewed studies believed students with ASD needed to be taught adaptation and life skills. According to some teachers, not knowing how to adapt to unfamiliar situations made the students with ASD “targets for bullying” (Able et al., 2015, p. 49). In addition, teachers displayed concerns about the future of these students while acknowledging the role teachers played in providing them with life skills, in collaboration with students’ parents and peers (Danker et al., 2019).

## Self-Acceptance of ASD

Some students with ASD from our reviewed studies showed acceptance of their diagnosis: “I like being like this you know, that’s the way it is” (Humphrey & Lewis, 2008, p. 32). However, for other students with ASD, having this label had a negative connotation: “Oh my God I’m a freak!,” “It’s like I have a bad brain” (Humphrey & Lewis, 2008, p. 31). Nevertheless, teachers from our review thought a sense of self-awareness of students with ASD would be crucial for the teacher-student interaction and for the students to overcome their educational barriers (Danker et al., 2019).

## Trusting Others and Feeling Safe

Unfortunately, students with ASD sometimes lacked the social networks to protect them from the challenges they faced at school, such as exposure to bullying and social isolation (Humphrey & Symes, 2010). A good strategy to solve this issue relies on the teacher’s effort to get to know the student, so that they become more comfortable with the teachers and confide in them (Dillon et al., 2016). Trusting teachers may help students to feel comfortable to report incidents (Saggers, 2015), or peers’ mistakes (Emam & Farrell, 2009). The teachers in the reviewed studies also acknowledged that schools should be a place where the students with

ASD feel safe to share any struggles they might be facing (Danker et al., 2019).

## Discussion

In this systematic literature review, we aimed to examine which aspects of teacher-student interactions contribute to a successful inclusion of students with ASD in mainstream secondary classroom settings. Our study illustrates a vast gap in the literature about this topic. For instance, the included papers did not specify observable features of interactions, such as specific actions of students and teachers, or their perceptions of these. We were, therefore, not able to identify which specific interactional features facilitate the inclusion of students with ASD in the mainstream classroom. Yet, these interactional processes are crucial since they have a high impact on student’s school performance, engagement and attitudes toward school (Alder, 2002; Breault, 2013; Smith & Schmidt, 2012).

Most themes we could distinguish in this review could be considered as requirements that have to be met first to facilitate teacher-student interactions. For instance, secondary school teachers felt that pre-service education could be improved, and that having more time for in-service training and help from other teachers and parents were necessary to better interact with students with ASD (Able et al., 2015; Danker et al., 2019). With regard to their interaction with specific students, teachers required enough time to get to know the student, and indicated they use specific interaction strategies to help students with ASD. These were especially related to fostering engagement, supporting group work and classroom management. Students in the reviewed studies preferred a calm and structured school environment and smaller class sizes. This literature review showed, for instance, that students with ASD felt an urge to leave their classroom when there was too much noise (Humphrey & Lewis, 2008). This is consistent with other, recent, studies in which researchers have found that prior to their transition to secondary school, most children with ASD worry about the size of their prospective schools and the sensory difficulties (particularly the noise) they will encounter (Makin et al., 2017). Moreover, in another study, young people with ASD expressed a strong need for schools to provide a quiet space in which the noise could be avoided (Hasson et al., 2022). Providing access to such spaces might help decrease the stress and anxiety levels that these students experience (Lebenhagen, 2022), and support their mental health and well-being, which is, according to parents in a recent study, negatively affected by mainstream education experiences (McKinlay et al., 2022). Another source of stress that students mentioned, according to the studies included in this review, was the workload in secondary education. In line

with this, students with ASD in other studies have voiced that the pressure of their homework is almost unmanageable (Makin et al., 2017) and that this needs to be taken into account by schools and teachers.

A sense of belonging in mainstream education and a connection to their own school was considered very important for students with ASD. For this to happen, some articles in our review indicated that these students needed to feel they were being treated just like their classmates during their interactions with their teachers. At some instances, it seemed as if this was not possible because teachers believed the students needed extra support, although the students themselves had mixed opinions on the topic (Emam & Farrell, 2009; Humphrey & Lewis, 2008). Extra help was appreciated, but could also flag differences between them and other students (Humphrey & Lewis, 2008). Interestingly, in the majority of the studies, the perspective of students with ASD was explicitly addressed. Indeed, multiple authors have stressed the importance of including the voices of students with ASD in research (Goodall & MacKenzie, 2018; Milton & Bracher, 2013; Pellicano et al., 2014). Focusing on the students' perspectives likely benefits their inclusion. Yet, a major finding from our review is that teachers often tended to *infer* the specific needs of students with ASD during their interactions with them, and generally, in the classroom. One possible explanation for this is that during teacher-student interactions, both interaction partners influence each other (Van der Steen et al., 2019). This means that based on their interactions with students with ASD, secondary school teachers might be able to (accurately) perceive students' needs, even if these are not expressed by the students themselves. Note, however, that some of these perceived needs might not align with what students would express themselves. An example is the presence of TAs in mainstream classrooms. In one particular study, teachers showed a strong preference for TAs and indicated several ways in which TAs could benefit the student (Emam & Farrell, 2009). Yet, students with ASD in another study did not think they would benefit from having a TA by their side (Humphrey & Lewis, 2008). Although these outcomes come from separate studies, it flags the importance of the role of a TA. If TAs are hired to benefit the students' progress and understanding of school subjects, their role needs to be clarified and discussed between teacher and student (Blatchford et al., n.d.; Webster et al., 2011).

Several studies mentioned that students with ASD were eager to interact and connect with their teachers. For instance, when students expressed their preference for a small school or class size, it was mostly because they believed this would allow them to have more time to interact with their teacher (Goodall, 2019). However, research shows that even in special education, where class-sizes are smaller in comparison to mainstream classroom settings, one-to-one interactions between teachers and students are, regrettably,

scarce. One study in a special education setting found that 46% of students did not receive individual instruction, even though it is essential for their academic performance (Van der Worp-van der Kamp et al., 2018).

Our literature search focused on secondary education, given that this environment provides more challenges for students with ASD. Croydon et al. (2019) pointed out that both the social and academic requirements (such as dealing with the physical space and having more complex lessons) are more demanding for students with ASD at this educational level. Yet, most of our findings do not seem to be very specific to this level of education, especially with regard to careful scaffolding to complete tasks, clarity and consistency of teachers' messages and helping students to "push forward" (Dillon et al., 2016; Saggars, 2015). This might lead to the conclusion that the needs of students with ASD do not seem to change significantly over the years, even though the environment does. Differences between primary and secondary education are often emphasized in the literature, and especially the effect those differences have on students with ASD (Aubineau & Blicharska, 2020; Humphrey & Lewis, 2008). Given the results of this review, we question to what extent the needs of students with ASD in the secondary classroom settings differ from their needs in primary schools. If such needs do not differ significantly, communication between the primary and secondary education teachers might help to ease the transition from primary to secondary school, provide hints to the (new) teachers about what works best during interactions and allow the secondary school teachers to meet the educational needs of the student with ASD. It should also be noted that some of the needs that students with ASD expressed in the reviewed studies are not unique and could apply to all students, such as having enough opportunities to interact with teachers, a sense of belongingness, and a structured and well-organized learning environment. Hence, by meeting the needs of students with ASD during interactions within the classroom, teachers might also address the needs of other students.

Our results seem to indicate that students with ASD find interactions with their teachers difficult, mostly because they do not know *how* to interact or *what* to do (Emam & Farrell, 2009). In some studies, teachers indicated that students with ASD had trouble to read the teachers' emotions and behaviors during their interaction, and so they would distance themselves from the student (Emam & Farrell, 2009). For students with ASD, on the other side, it was complicated to find a moment to interact with the teacher, either because the presence of a TA would interfere (Emam & Farrell, 2009), or because the class size would not allow for it (Goodall, 2019). This is striking, because the teacher-student interaction is essential for students' development and learning (Steenbeek et al., 2012; Van der Steen

et al., 2019). Unfortunately, the studies that were part of this review seem to indicate that the opportunities for students with ASD to interact with their teachers in secondary education are limited, which might impair their academic performance and social development.

### Strengths and Limitations of the Review

This review aimed to examine which aspects of teacher-student interactions contribute to a successful inclusion of students with ASD in mainstream secondary classroom settings, and provides an overview of the current literature base, thereby identifying the current gaps in the literature. Note, however, that we limited our study to the perspectives of teachers and students with ASD, while other stakeholders, such as parents or peers, are a great source of information about the characteristics of the student with ASD. A focus on peers might yield interesting information particularly related to social inclusion, (prevention of) bullying, and fostering friendships. The main limitation of our review, however, is that we were not able to provide concrete recommendations with respect to teacher-student interactions in secondary classroom settings. Our findings, however, do shed on the needs of both teachers and students with regard to their interactions, which could be helpful for policy makers and school leaders. In the case of students with ASD, a small class/school size was considered important, while teachers in the reviewed studies emphasized their need for professionalization.\*\*\*

### Considerations for Future Research

While observations seem the most obvious choice to investigate teacher-student interactions as they happen in real time, most studies relied on semi-structured interviews in which students and teachers *reflect on* aspects that facilitate inclusion in mainstream education. Although this yields helpful information, the field might benefit from more studies that specifically observe the interaction between teachers and students with ASD as it occurs. Researchers are, therefore, strongly advised to direct future studies to teacher-student interactions as they occur in vivo, for example, by using observations or (diary) questions specifically focused on the interactions teachers and students have. Moreover, we recommend focusing research on secondary education for two reasons. First, research at this educational level is scarce. Second, these environments can be particularly challenging for students with ASD, not only due to the chaos and noise but also because students with ASD have time-limited interactions with multiple teachers (who have their own characteristics) during a school day. Accordingly, it is essential to investigate into how these interactions develop over time and most importantly, what key interactional processes foster a more inclusive education for students with ASD.

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**Conflict of Interest** The authors declare no competing interests.

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### References

#### \*Study included in the review

- \*Able, H., Sreckovic, M., Schultz, T., Garwood, J., & Sherman, J. (2015). Views from the trenches: Teacher and student supports needed for full inclusion of students with ASD. *Teacher Education and Special Education, 38*(1), 44–57. <https://doi.org/10.1177/0888406414558096>
- Ainscow, M., & Miles, S. (2008). Making education for all inclusive: Where next? *Prospects, 38*, 15–34. <https://doi.org/10.1007/s11125-008-9055-0>
- Alder, N. (2002). Interpretations of the meaning of care: Creating caring relationships in urban middle school classrooms. *Urban Education, 37*(2), 241–266. <https://doi.org/10.1177/0042085902372005>
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders*. Author.
- Aubineau, M., & Blicharska, T. (2020). High-functioning autistic students speak about their experience of inclusion in mainstream secondary schools. *School Mental Health, 12*, 537–555. <https://doi.org/10.1007/s12310-020-09364-z>
- Azad, G., & Mandell, D. (2016). Concerns of parents and teachers of children with autism in elementary school. *Autism, 20*(4), 435–441. <https://doi.org/10.1177/1362361315588199>
- Blacher, J., Howell, E., Lauderdale-Littin, S., DiGennaro Reed, F., & Laugeson, E. A. (2014). Autism spectrum disorder and the student teacher relationship: A comparison study with peers with intellectual disability and typical development. *Research in Autism Spectrum Disorders, 8*(3), 324–333. <https://doi.org/10.1016/j.rasd.2013.12.008>
- Blatchford, P., Webster, R., & Russell, A. (n.d.). *Challenging the role and deployment of teaching assistants in mainstream schools: The Impact on schools. Final report on the Effective Deployment of*

- Teaching Assistants (EDTA) project*. [https://discovery.ucl.ac.uk/id/eprint/10096860/1/Blatchford\\_EDTA\\_project\\_final\\_report.pdf](https://discovery.ucl.ac.uk/id/eprint/10096860/1/Blatchford_EDTA_project_final_report.pdf)
- Bramer, W., Giustini, D., De Jonge, G., Holland, L., & Bekhuis, T. (2016). De-duplication of database search results for systematic reviews in EndNote. *Journal of the Medical Library Association*, 104(3), 240–243. <https://doi.org/10.3163/1536-5050.104.3.014>
- Breault, R. (2013). “She was great, but...”: Examining preservice recollections of favorite and most effective teachers. *Professional Educator*, 37(1). <https://files.eric.ed.gov/fulltext/EJ1019125.pdf>
- Centers for Disease Control and Prevention. (2021). *Data & Statistics on Autism Spectrum Disorder*. <https://www.cdc.gov/ncbddd/autism/data.html>
- Croydon, A., Remington, A., Kenny, L., & Pellicano, E. (2019). ‘This is what we’ve always wanted’: Perspectives on young autistic people transition from special school to mainstream satellite classes. *Autism & Developmental Language Impairments*, 4, 1–16. <https://doi.org/10.1177/2396941519886475>
- \*Danker, J., Strnadová, I., & Cumming, T. M. (2019). “They don’t have a good life if we keep thinking that they’re doing it on purpose!”: Teachers’ perspectives on the well-being of students with autism. *Journal of Autism & Developmental Disorders*, 49(7), 2923–2934. <https://doi.org/10.1007/s10803-019-04025-w>
- Van der Worp-van der Kamp, L., Bijstra, J. O., Pijl, S. J., Post, W. J., & Minnaert, A. E. M. G. (2018). The amount of instruction provided by teachers versus the amount of instruction actually received by their students in special education. *European Journal of Special Needs Education*, 33(4), 541–554. <https://doi.org/10.1080/08856257.2017.1373495>
- Devi, A., & Ganguly, R. (2022). Pre-service teachers’ and recent teacher graduates’ perceptions of self efficacy in teaching students with autism spectrum disorder—An exploratory case study. *International Journal of Inclusive Education*. <https://doi.org/10.1080/13603116.2022.2088869>
- \*Dillon, G. V., Underwood, J. D. M., & Freemantle, L. J. (2016). Autism and the U.K. secondary school experience. *Focus on Autism & Other Developmental Disabilities*, 31(3), 221–230. <https://doi.org/10.1177/1088357614539833>
- \*Emam, M. M., & Farrell, P. (2009). Tensions experienced by teachers and their views of support for pupils with autism spectrum disorders in mainstream schools. *European Journal of Special Needs Education*, 24(4), 407–422. <https://doi.org/10.1080/08856250903223070>
- Garrad, T.-A., Rayner, C., & Pedersen, S. (2019). Attitudes of Australian primary school teachers towards the inclusion of students with autism spectrum disorders. *Journal of Research in Special Educational Needs*, 19(1), 58–67. <https://doi.org/10.1111/1471-3802.12424>
- Goodall, C., & MacKenzie, A. (2018). What about my voice? Autistic young girls’ experiences of mainstream school. *European Journal of Special Needs Education*, 34(4), 499–513. <https://doi.org/10.1080/08856257.2018.1553138>
- \*Goodall, C. (2019). ‘There is more flexibility to meet my needs’: Educational experiences of autistic young people in Mainstream and Alternative Education Provision. *Support for Learning*, 34(1), 4–33. <https://doi.org/10.1111/1467-9604.12236>
- Hasson, L., Keville, S., Gallagher, J., Onagbesan, D., & Ludlow, A. K. (2022). Inclusivity in education for autism spectrum disorders: Experiences of support from the perspective of parents/carers, school teaching staff and young people on the autism spectrum. *International Journal of Developmental Disabilities*. <https://doi.org/10.1080/20473869.2022.2070418>
- Helps, S., Newsom-Davis, I. C., & Callias, M. (1999). Autism: The teacher’s view. *Autism*, 3(3), 287–298. <https://doi.org/10.1177/1362361399003003006>
- Hong, Q., Fàbregues, S., Bartlett, G., Boardman, F., Cargo, M., Dagenais, P., Gagnon, M. P., Griffiths, F., Nicolau, B., O’Cathain, A., Rousseau, C., Vedel, I., & Pluye, P. (2018). The Mixed Methods Appraisal Tool (MMAT) version 2018 for information professionals and researchers. *Education for Information*, 34(4), 285–291. <https://doi.org/10.3233/EFI-180221>
- \*Humphrey, N., & Lewis, S. (2008). “Make me normal”: The views and experiences of pupils on the autistic spectrum in mainstream secondary schools. *Autism*, 12(1), 23–46. <https://doi.org/10.1177/1362361307085267>
- \*Humphrey, N., & Symes, W. (2010). Perceptions of social support and experience of bullying among pupils with autistic spectrum disorders in mainstream secondary schools. *European Journal of Special Needs Education*, 25(1), 77–91. <https://doi.org/10.1080/08856250903450855>
- Lebhagen, C. (2022). Autistic students’ view on meaningful inclusion: A Canadian perspective. *Journal of Education*, 0(0), 1–16. <https://doi.org/10.1177/00220574221101378>
- Lindsay, S., Proulx, M., Thomson, N., & Scott, H. (2013). Educators’ challenges of including children with autism spectrum disorder in mainstream classrooms. *International Journal of Disability, Development & Education*, 60(4), 347–362. <https://doi.org/10.1080/1034912X.2013.846470>
- Makin, C., Hill, V., & Pellicano, E. (2017). The primary-to-secondary school transition for children on the autism spectrum: A multi-informant mixed-methods study. *Autism & Developmental Language Impairments*, 2, 1–18. <https://doi.org/10.1177/239694151668434>
- McKinlay, J., Wilson, C., Hendry, G., & Ballantyne, C. (2022). “It feels like sending your children into the lions’ den” — A qualitative investigation into parental attitudes towards inclusion, and the impact of mainstream education on their child. *Research in Developmental Disabilities*, 120.
- Memisevic, H., Dizdarevic, A., Mujezinovic, A., & Djordjevic, M. (2021). Factors affecting teachers’ attitudes towards inclusion of students with autism spectrum disorder in Bosnia and Herzegovina. *International Journal of Inclusive Education*. <https://doi.org/10.1080/13603116.2021.1991489>
- Milton, D., & Bracher, M. (2013). Autistics speak but are they heard? *Medical Sociology Online*, 7(2), 61–69. <https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.1083.6803&rep=rep1&type=pdf>
- Moher, D., Liberatti, A., Tetzlaff, J., Altman, D., & The PRISMA Group. (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA statement. *PLoS Medicine*, 6(7). <https://doi.org/10.1371/journal.pmed.1000097>
- Ouzzani, M., Hammady, H., Fedorowicz, Z., & Elmagarmid, A. (2016). Rayyan—A web and mobile app for systematic reviews. *Systematic Reviews*, 5, 2–10. <https://doi.org/10.1186/s13643-016-0384-4>
- Pellicano, E., Dinsmore, A., & Charman, T. (2014). What should autism research focus upon? Community views and priorities from the United Kingdom. *Autism*, 18(7), 756–770. <https://doi.org/10.1177/1362361314529627>
- Pijl, S. J., & Meijer, C. J. W. (1991). Does integration count for much? An analysis of the practices of integration in eight countries. *European Journal of Special Needs Education*, 6(2), 100–111. <https://doi.org/10.1080/0885625910060202>
- Prino, L., Pasta, T., Gastaldi, M., & Longobardi, C. (2016). The effect of autism spectrum disorders, Down syndrome, specific learning disorders and hyperactivity and attention deficits on the student-teacher relationship. *Electronic Journal of Research in Educational Psychology*, 14(1), 89–106. <https://doi.org/10.14204/ejrep.38.15043>
- \*Saggers, B. (2015). Student perceptions: Improving the educational experiences of high school students on the autism spectrum. *Improving Schools*, 18(1), 35–45. <https://doi.org/10.1177/13654802145666213>

- Segall, M., & Campbell, J. (2012). Factors relating to education professionals' classroom practices for the inclusion of students with autism spectrum disorders. *Research in Autism Spectrum Disorders*, 6(3), 1156–1167. <https://doi.org/10.1016/j.rasd.2012.02.007>
- Smith, M., & Schmidt, K. (2012). Teachers are making a difference: Understanding the influence of favorite teachers. *The Qualitative Report*, 17(18), 1–25. <https://doi.org/10.46743/2160-3715/2012.1778>
- Van der Steen, S., Geveke, C., Steenbakkens, A. T., & Steenbeek, H. (2020). Teaching students with autism spectrum disorders: What are the needs of educational professionals? . *Teaching and Teacher Education*, 90. <https://doi.org/10.1016/j.tate.2020.103036>
- Steenbeek, H., Jansen, L., & Van Geert, P. (2012). Scaffolding dynamics and the emergence of problematic learning trajectories. *Learning and Individual Differences*, 22, 64–75. <https://doi.org/10.1016/j.lindif.2011.11.014>
- Thomas, J., & Harden, A. (2008). Methods for the thematic synthesis of qualitative research in systematic reviews. *BMC Medical Research Methodology*, 8(45). <https://doi.org/10.1186/1471-2288-8-45>
- Thomas, J., & Harden, A. (2012). Synthesis: Combining results systematically and appropriately. In D. Gough, S. Oliver, & J. Thomas (Eds.), *An introduction to systematic reviews* (pp. 179–226). SAGE.
- UNESCO. (1994). *The Salamanca statement and Framework For Action On Special Needs Education* UNESCO.
- UNESCO. (2015). *Education 2030: Incheon declaration and framework for action for the implementation of Sustainable Development Goal 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all*. UNESCO. <https://unesdoc.unesco.org/ark:/48223/pf0000245656>
- Van der Steen, S., Steenbeek, H., Den Hartigh, R. J. R., & Van Geert, P. (2019). The link between microdevelopment and long-term learning trajectories in science learning. *Human Development*, 63, 4–32. <https://doi.org/10.1159/000501431>
- Webster, R., Blatchford, P., Bassett, P., Brown, P., Martin, C., & Russell, A. (2011). The wider pedagogical role of teaching assistants. *School Leadership and Management*, 31(1), 3–20. <https://doi.org/10.1080/13632434.2010.540562>
- Zambrano, R., & Orellana, M. (2018). Actitudes de los docentes hacia la inclusión escolar de niños con autismo [Teachers' attitudes towards school inclusion of children with autism]. *Revista Killkana Sociales*, 2(4), 39–48. [https://doi.org/10.26871/killkana\\_social.v2i4.296](https://doi.org/10.26871/killkana_social.v2i4.296)

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