Teaching students with Autism Spectrum Disorders

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Teaching students with Autism Spectrum Disorders: What are the needs of educational professionals?

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HIGHLIGHTS

- When educational policies change, this may impact the needs of educational professionals.
- We identified four groups of educational professionals with different needs when teaching students with ASD.
- Differences and similarities in needs between these groups were highlighted.
- Groups differed in their need for collaboration, didactic strategies, confidence and supporting social behavior.
- Especially younger professionals indicated a need to feel more confident when teaching students with ASD.

ARTICLE INFO

ABSTRACT

The academic achievements of students with Autism Spectrum Disorder (ASD) are usually lower than those of their peers. It is therefore important to know what educational professionals need to provide these students with optimal support. To identify these needs, we applied Q methodology, a qualitative method using quantitative techniques. We found four groups of professionals with different needs. The first group emphasized a need for collaboration within school; the second valued practical suggestions to guide their teaching, the third emphasized gaining more confidence to teach students with ASD, and the fourth group focused on enhancing students' social and communication skills.

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Students diagnosed with Autism Spectrum Disorder (ASD) have limitations with regard to functional and effective communication, show repetitive behaviors, and have impairments in initiating and sustaining reciprocal social interactions (American Psychiatric Association, 2013). They form a challenging group of learners with a variety of learning challenges that interfere with their academic performance (Leekam, Prior, & Uljarevic, 2011). In general,

students with ASD do not reach the same academic outcomes as typically developing students (National Research Council, 2001). Even though their implicit learning abilities seem to be intact, their social and communication problems hinder them to optimally use the teachers' support during their learning process (Barnes et al., 2008; Steenbeek, Jansen, & Van Geert, 2012). Students with ASD also show difficulties when higher-level language processing is needed for a given educational task (Noens & van Berckelaer-Onnes, 2005), and have impaired executive functions. That is, they have trouble to focus and sustain their attention, to manage their time effectively, and to monitor or correct themselves (Liss et al., 2001; Rosenthal et al., 2013). Independent classroom activities are hard for students with ASD; they are easily distracted and

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often show off-task behavior (Ruble & Robson, 2007). Indeed, a recent study found that students with ASD only spent half of their time in the classroom being actively engaged (Sparapani, Morgan, Reinhardt, Schatschneider, & Wetherby, 2016). Lastly, students with ASD may show stereotyped behavior and fixated interests, which could cause social isolation (American Psychiatric Association, 2013; van der Worp-van der Kamp, Pijl, Bijstra, & van den Bosch, 2013; Westling, 2010).

Students with ASD generally need a form of specialized education (van der Worp-van der Kamp et al., 2013), and are therefore considered students with 'special educational needs' (SEN). Depending on their country of residence and the severity of the student's problems, students with ASD are enrolled in special classrooms or schools (OECD, 2005), or receive extra resources within regular educational facilities, such as visual aids or special instructions. In the last two decades, students with ASD are increasingly enrolled in regular school settings (De Leeuw, de Boer, & Minnaert, 2018; Lindsay, Proulx, Scott, & Thomson, 2014). This worldwide trend toward inclusion makes it important to provide educational professionals with the resources they need to optimally teach students with ASD in general education settings (National Research Council, 2001; De Boer, Pijl, & Minnaert, 2011).

Educational professionals, and especially teachers, are crucial to successfully implement inclusive education. Unfortunately, research has shown that professionals in general education feel they lack knowledge about educating students with SEN. They do not feel competent or confident when teaching students with ASD (De Boer et al., 2011; Simpson, De Boer-Ott, & Smith-Myles, 2003; Van der Worp-; Van der Kamp et al., 2013; Westling, 2010), and truly including these students within the mainstream classroom seems a challenging task (Lindsay et al., 2014). The heterogeneity in the population students with ASD makes it hard for educational professionals to meet the diverse needs of these students (Breitenbach, Armstrong, & Bryson, 2013; Mooij & Smeets, 2009). Iovanne, Dunlap, Huber, and Kincaid (2003) argued that there is no evidence for the effect of a single educational program that would optimally support all students with ASD. The specific behavior, needs, interests, and learning styles of students with ASD require targeted individualized support (Able, Sreckovic, Schultz, Garwoord & Sherman, 2015). Indeed, the academic performance of these students highly depends on the extent to which the educational program can be individualized (Lynch & Irvine, 2009). The interaction with the teacher, or other educational professionals, such as a teaching assistant or educational specialist, is crucial in this regard (Caplan, Feldman, Eisenhower, & Blacher, 2016). At any moment in time, the teacher affects the student, and vice versa (Fogel & Garvey, 2007). The flow of this interaction depends on characteristics of both the student and the teacher, such as the student's specific behavioral challenges, interests, the teacher's experience in teaching students with ASD (Caplan et al., 2016), and his or her needs when it comes to supporting these students in an inclusive setting.

While many studies address the needs of students with ASD in inclusive education, and especially their social support needs, research on the needs of their teachers is limited (Able, Sreckovic, Schultz, Garwood, & Sherman, 2015). In an early study by Buell, Hallam, Gamel-Mccormick, and Scheer (1999) general education professionals reported they had less available resources and support compared to their colleagues in special education. They indicated they needed appropriate in-service training to optimize their curriculum, to find ways to assess the progress of their students with SEN, manage challenging behavior in the classroom, and use assistive technology. Since then, most studies on educational professionals in inclusive classroom settings have focused on their attitudes (e.g., Avramidis, Bayliss, & Burden, 2000), teaching

strategies (e.g., Florian & Black-Hawkins, 2011; Iovanne et al., 2003; Lindsay et al., 2014; Park, Chitiyo, & Choi, 2010), or the challenges they experience (e.g., De Boer et al., 2011; McCray & McHatton, 2011; Van der Worp-; Van der Kamp et al., 2013; Westling, 2010). Although these studies take a somewhat different angle, they do provide an indication of the needs of general education professionals when it comes to teaching students with SEN and teaching students with ASD in particular.

The inclusive pedagogy framework (Florian & Black-Hawkins, 2011), for example, emphasizes the teaching of students with SEN as a professional challenge that requires working together with other professionals and parents, building a positive classroom climate, and ongoing professional development. Translating this framework to possible needs of general education professionals results in elements such as collaboration with other professionals, ways to coordinate action plans with those at home, the stimulation of social activities and friendships of students with SEN, and in-service training of educational professionals. The Autism Spectrum Disorder Inclusion Collaboration Model (Simpson et al., 2003) is more specifically devoted to students with ASD, and offers educational professionals guidelines to facilitate these students' inclusion in regular education. In line with the inclusive pedagogy framework, this model accentuates collaboration within the school team, such as shared decision making, and collaboration with parents. It also values collaboration with experts such as social workers and speech/language therapists. In order to provide students with ASD with an education tailored to their needs, appropriate and flexible curricula and instructional methods are needed, as well as enough time for teachers to familiarize themselves with these materials and to plan their lessons. The model further emphasizes the value of in-service training and ongoing evaluation of classroom practices. Lastly, it stresses reduced class sizes and/or teaching assistance. Most of these needs are also highlighted by Lindsay et al. (2014) in their article about teachers' strategies for the inclusion of students with ASD in regular education. In this study more specific teaching strategies are discussed, such as the use of visual aids, focusing on the student's interests and strengths, having a structured routine in place, and provide student-specific goals and rewards. In addition, these authors mention the availability of school resources such as a time-out or quiet space, and creating a culture of social acceptance in the classroom by means of disability awareness or sensitivity training.

Some authors specifically focus on the *ways* to successfully address the needs of educational professionals, so that they can fully implement inclusive education. For example, Simpson et al. (2003) emphasize that the added value of collaboration with experts depends on whether or not educational professionals know how to access them, and whether their services can be properly coordinated. In case of co-teaching or the assistance of para-educators, sufficient planning time, compatibility of co-teachers, and adequate training are a prerequisite (Scruggs, Mastropieri, & McDuffie, 2007). Educators in the study of Able et al. (2015) mentioned that specific teaching strategies only work when teachers know how to structure the classroom to individually support students. For teachers, knowing when and how to support the student with ASD is crucial, and properly constructed Individualized Education Programs (IEPs) can be of great help. Yet, those IEPs are only helpful if they are properly accessible, and include, for example, a brief outline of the student's specific needs and characteristics. Mooij and Smeets (2009) argued that a coherent pedagogical-didactic structure is needed to connect the student's characteristics to curricular levels and materials. Lastly, facilitating students' social skills requires enough time, and a high workload and a strong emphasis on academic achievements may limit teachers in this regard (Able et al., 2015).

To summarize, research on the challenges, attitudes and teaching strategies of general education professionals who teach students with ASD highlights collaboration with colleagues, parents and other professionals, ongoing in-service training, flexible classroom management and didactic strategies, school resources, a clear school policy with regard to students with ASD, and ways to stimulate social acceptance in the classroom. If the needs of educational professionals are properly met, they can better support their students with ASD, with regard to both their academic performance as well as their social skills. However, research shows that the needs of general education professionals and the relative importance of these needs likely differ depending on their characteristics, their experience, and the specific teaching context (cf. Able et al., 2015; Iovanne et al., 2003). This differential view is relatively understated in the literature so far. The aim of this study is therefore to identify and distinguish groups of general education professionals with different needs with regard to supporting their students with ASD. Besides offering a differential perspective on teachers' needs, this research can serve to stimulate the conversation about meeting these needs, and may help to establish the resources needed for this, which will ultimately benefit both the general education professionals as well as their students with ASD.

This study was guided by the following two research questions. First, can we identify groups of general education professionals with different needs with regard to supporting students with ASD, and if so, what distinguishes these groups? Second, can we link these groups with different needs to specific characteristics of the professionals, such as their gender, age, position, grade they teach, years of experience, and their experience with students with ASD?

1. Method

1.1. Participants

Forty-three educational professionals participated in this study (26 female, 17 male), with a mean age of 36.51 ($SD = 11.0$). The professionals worked at four different Dutch schools, and most of them had a teaching position ($n = 32$). All professionals worked with children aged 4−12 (K − 6 education), and had 9.38 years of working experience on average ($SD = 9.36$). All participants were familiar with ASD, 63% stated they currently worked with students with ASD, while the other participants (37%) reported to have worked with students with ASD in the past.

Recruitment went via the researchers' contacts at three local school boards. Within these school boards, the purpose of the study was explained and the team leaders of four schools indicated they were interested to be part of the study (convenience sampling). The professionals of these four schools were asked to perform the Q sort (see below) as part of their team meeting, after they were informed about the purpose and procedure of the study.

1.2. Procedure

We used a Q methodological method to identify and distinguish groups of educational professionals with different needs. Q methodology aims to reveal views, beliefs and opinions among participants (McKeown & Thomas, 1988). Participants are typically asked to sort a set of statements regarding the topic of interest in a grid with a quasi-normal distribution (the so-called Q sort, see Fig. 1). This 'forced-choice' setup reveals how participants identify with these statements (Watts & Stenner, 2012), and which needs are the most and least pressing for them. The individual Q sorts of participants are thereafter compared and grouped with the help of a software program (see below), in order to illustrate the different viewpoints held by groups of participants (McKeown & Thomas,

1988). Q methodology can therefore be considered as a qualitative method applying quantitative techniques (Shemmings & Ellingsen, 2012).

In the current study, participants first answered questions about their gender, age, position within the school, the age of their students (the grade they teach), and their years of experience on a question form. They were also asked to indicate their experience with students with ASD, and could select one of the following options: a) currently teaching a student with ASD, b) previously taught a student with ASD, c) expect to teach a student with ASD in the future (who is now in a lower grade), d) experience with ASD in another way, e) no experience.

Participants were then presented with a separate sheet of paper with 50 statements representing possible needs with regard to teaching students with ASD (see Table 2) and a sheet showing a grid with a quasi-normal distribution (see Fig. 1). Participants were asked to fill each cell of the grid with one of the statement numbers. They were asked to position the statement number based on how important that specific need was for them, keeping in mind the student with ASD they (had) taught. After sorting the statements, participants were given the opportunity to elaborate on the statements they found particularly important ($+5$) and unimportant (-5) by filling out the following question: "The two statements that correspond with my most/least important needs are [insert statement number], because …." Roughly a third of the participants ($n = 12$) elaborated on the sorting of their most and least important needs.

1.3. Measures − statements

The statements used for the Q sort were constructed by three professionals in higher education, who have research or teaching experience with students with ASD. This resulted in a set of 50 statements that represented the possible needs of educational professionals with regard to teaching students with ASD. Based on the literature (see Introduction section), the statements specifically covered classroom management, didactic strategies, supporting social behavior, parental contact and involvement, school policy and relations within the school, school facilities, and in-service training. The final set of statements was checked by an educational specialist who works in special education and an associate professor with research experience involving students with ASD, to make sure all possible needs were covered. Examples of statements are: "[I need] suggestions to structure the daily program and lessons for the student with ASD" (classroom management); "[I need] a clear policy to share knowledge and collaborate within the school with regard to students with ASD" (school policy and relations within the school), and "[I need] school facilities like a time-out or quiet space for the student" (school facilities). The statements were constructed in Dutch and translated to English to present them in this article. Table 2 lists the complete set of statements.

1.4. Data analysis

To identify and distinguish groups of educational professionals with different needs (research question 1), the Q sorts of the professionals were entered into the software program PQ Method (Schmolck, 2002). Participants' sorting of the statements were then subjected to a by-person factor analysis. Hence, the program extracted factors (groups of participants) based on correlations between participants' sorting, instead of correlations between items. Several factor solutions were explored after applying Principal Component factor analyses with Varimax rotation (Brown, 1980). The participants who significantly associated with a factor at $p < .05$ were automatically distinguished by the program. The
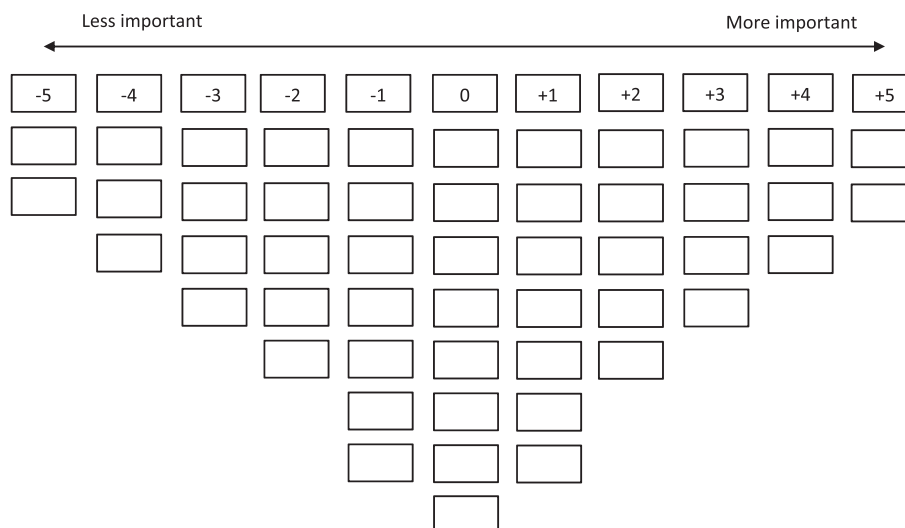
Fig. 1. Q sort grid as used for this study, with a quasi-normal distribution. Participants were asked to individually sort the 50 statements (see Table 2) using this grid, with the least important statements about their needs on the left and the most important statements on the right.

Table 1
Factor loadings.

	Factor 1 ($n = 12$)	Factor 2 ($n = 8$)	Factor 3 ($n = 7$)	Factor 4 ($n = 8$)
pp1	0.003	0.353	0.091	**0.602***
pp2	0.058	0.117	−0.121	**0.607***
pp3	−0.215	0.234	−0.404	0.369
pp4	0.470	−0.233	0.426	0.323
pp5	**0.651***	−0.248	0.300	−0.158
pp6	**0.735***	−0.026	0.008	−0.244
pp7	0.200	**0.397***	−0.265	0.193
pp8	0.328	**0.381***	0.105	0.152
pp9	−0.176	**0.619***	0.049	0.041
pp10	**0.496***	0.409	−0.146	0.067
pp11	0.161	−0.021	−0.083	**0.557***
pp12	0.038	**0.337***	0.143	0.159
pp13	0.286	−0.042	**0.565***	−0.010
pp14	−0.010	0.118	**0.517***	0.352
pp15	0.030	**0.572***	0.044	−0.001
pp16	−0.412	0.414	0.415	0.344
pp17	−0.226	0.306	0.204	0.394
pp18	**0.528***	0.142	0.296	0.003
pp19	**0.539***	0.233	−0.144	0.272
pp20	0.061	−0.235	**0.430***	0.273
pp21	0.019	0.256	**0.484***	0.101
pp22	0.140	**0.603***	0.175	0.183
pp23	−0.110	**0.558***	−0.048	0.018
pp24	**0.548***	0.162	0.240	0.180
pp25	0.204	−0.033	**0.501***	0.192
pp26	**0.518***	−0.192	0.056	0.179
pp27	**0.513***	0.114	0.091	−0.060
pp28	−0.032	0.149	0.127	**0.646***
pp29	**0.458***	0.087	0.389	−0.126
pp30	**0.513***	0.304	−0.210	0.244
pp31	0.067	0.223	−0.030	0.092
pp32	0.119	0.090	**0.556***	−0.100
pp33	−0.041	0.027	**0.583***	0.145
pp34	0.026	0.415	0.379	−0.203
pp35	−0.054	0.011	0.085	**0.477***
pp36	**0.667***	0.204	0.101	−0.033
pp37	**0.471***	−0.162	0.425	0.042
pp38	0.309	0.083	0.306	−0.183
pp39	0.211	**0.562***	0.128	−0.102
pp40	−0.064	0.090	0.173	**0.626***
pp41	0.105	−0.1680	0.149	**0.556***
pp42	0.042	0.2826	−0.064	**0.321***
pp43	0.167	**0.555***	−0.139	0.024

Note. Significant loadings are indicated with an asterisk and in bold.

final factor solution, reported in the Results section, was chosen based on the eigenvalues, explained variance, number of participants associating with a factor, the correlations between factors and the interpretative value of the factors (Watts & Stenner, 2012). To ease the interpretation, each factor was converted back to a weighted average Q sort of the participants who associated with that factor, showcasing the statements that are most psychologically significant within each factor. The overall configurations of the factors were then qualitatively interpreted and compared by the researchers to identify which needs were present among the participants within each factor (cf. Watts & Stenner, 2012). Moreover, the software program indicated the statements that significantly differed between the factors ($p < .05$), the so-called 'distinguishing statements'. The distinguishing statements provided additional insights for the interpretation of the factors, together with the elaborations of the participants.

For the second research question, we used an exploratory analysis and compared the composition of the factors in terms of gender, age, profession, the age of their students, their years of experience, and their experience with students with ASD. Any differences that stood out are highlighted in the results section.

2. Results

A four-factor solution was chosen, which explained 38% of the total variance. Of the 43 participants, 36 significantly associated with one of the factors, meaning that seven participants did not associate with one particular factor. The correlation between the factors was low, ranging from 0.06 to 0.31, indicating that the four factors revealed considerably different viewpoints. Table 1 shows the factor loadings of each participant.

The weighted average Q sorts, which provide an overview of the typical arrangement of statements within each factor, are provided in Table 2. Statements that significantly differed between the factors ('distinguishing statements') are indicated in bold. Using Table 2, a qualitative interpretation of the four factors is provided below. The position of statements within each factor is indicated in the narration, i.e., when statement 12 is deemed most important (position 5), this is referred to as '#12/5'.

Table 2
Statements and the weighted average Q sorts for the four factors.

Statement (I need …)	Factor 1	Factor 2	Factor 3	Factor 4
1. Ways to make the school environment less turbulent/chaotic	−3	**−1**	−4	**−5**
2. Ways to organize impromptu learning moments without confusing the student	0	0	1	**3**
3. A method to organize individual instructions for the student in the classroom	−1	**0**	−3	−2
4. Ways to help the student to focus	**−4**	0	0	0
5. Suggestions to structure the daily program and lessons for the student	**−5**	−3	−1	−3
6. More time for pre-teaching the student	**0**	0	−4	−3
7. Ideas for visual support or study aids for the student during instruction and processing of the material	−1	5	1	**−4**
8. Ways to help the student deal with delayed attention of the teacher	**0**	1	−2	1
9. Ways to help the student to work independently	−1	3	−3	2
10. Ways to make the instruction understandable for the student	−3	1	−1	−3
11. Ideas to help the student to flexibly deal with the study materials	−2	**2**	−1	0
12. Ways to promote self-initiated questions of the student	0	**−3**	0	**5**
13. Suggestions to connect lessons to the student's interests	−2	−2	**−4**	**1**
14. Ideas to tailor the instruction/support to the strong points/talents of the student	1	**5**	2	3
15. Suggestions to help the student to collaborate with classmates	−2	**0**	−2	**3**
16. Suggestions to help the student to make choices	**−4**	−1	−1	**2**
17. Suggestions for suitable rewards to reinforce positive behavior of the student	−5	−4	**1**	**−1**
18. Ways to adjust learning tasks to the educational needs of the student	−3	1	−3	1
19. Ways to give adequate feedback on the behavior of the student	0	−1	**4**	**0**
20. Suggestions to help a distracted/disruptive student to re-focus on the task	**−1**	2	**5**	2
21. Ways to deal with sensory hypo-or hyper-sensitivity of the student	**−2**	**4**	0	1
22. Ideas to help the student reflect on his/her own work	**−1**	**4**	**−3**	**2**
23. Ways to support the social conversation skills of the student (such as starting or maintaining a conversation)	−1	2	2	4
24. Ways to teach the student socially adequate behaviors (for example making eye contact)	**1**	**−1**	4	3
25. Ways to help the student to see another person's point of view	2	1	0	**4**
26. Suggestions to stimulate social activities or friendships of the student	−2	−1	**2**	**5**
27. Ideas to help other students to deal with the student's social behavior	**2**	4	**0**	4
28. Input from parents to shape the lessons for the student	0	−1	**2**	0
29. Ways to constructively communicate with parents of the student	**2**	**−5**	0	−1
30. Ways to coordinate the action plans at school and at home	**3**	1	0	0
31. That my supervisor asks how things are going with this student	1	**−4**	**−2**	0
32. That my coworkers ask how things are going with this student	1	0	1	**−2**
33. To consult my supervisor or coworkers about this student	**4**	2	3	**−1**
34. Assistance of coworkers when dealing with challenging behavior of the student	4	0	**2**	−1
35. A joint responsibility to support this student	**5**	2	3	**−2**
36. A clear policy to share knowledge and collaborate within the school with regard to ASD	**4**	3	1	1
37. Opportunities to flexibly deal with the student with regard to school policy/rules	−1	−3	**3**	−2
38. School facilities like a time-out or quiet space for the student	3	**−2**	1	**−4**
39. Ways to track the student's progress (other than the typical pupil tracking system)	**0**	−2	**−5**	−3
40. Special educational materials for the student	0	**3**	−1	−1
41. Using/expanding the network of facilities around the school for the student	**2**	−2	−2	−1
42. Opportunities to administer tests within the school (for example intelligence tests)	1	−3	−2	**−5**
43. An extra tutor for the student in the classroom (for example a teaching assistant)	**3**	1	0	1
44. A specialist to support the student outside the classroom, such as a speech therapist	2	**−2**	1	2
45. In-service training (refresher courses) related to ASD	**3**	0	−1	1
46. Textbooks with information about ASD	−3	−4	−5	−4
47. Opportunities to monitor and evaluate my didactic skills	1	3	3	**0**
48. To feel more confident in contact with students with ASD	**−4**	**−5**	**4**	**0**
49. Examples of effective teaching strategies for students with ASD (videos or class visits)	1	1	−1	−2
50. To consult an internal or external specialist (for example a special education counselor) about how to approach the student	5	−1	5	−1

Note. Statements that significantly differed between the factors ('distinguishing statements') are indicated in bold.

2.1. Factor 1: "Let's do this together" (n = 12)

For the 12 educational professionals who were associated with this factor, collaboration with coworkers, supervisors, and specialists was essential. Their most important need was a joint responsibility (#35/5) to support students with ASD, and they also highly appreciated the possibility to consult a specialist inside or outside the school (#50/5). They indicated they needed a clear school policy aimed at sharing knowledge about ASD (#36/4). They preferred to consult their coworkers and supervisor about students with ASD (#33/4), and would appreciate their help when they considered a student's behavior challenging (#34/4). One of the participants (pp 36) commented that consultation and help of co-workers was "very important to support the student as well as possible", and "two heads are better than one". Other distinguishing statements indicated the need for a teaching assistant (#43/3), and refresher courses related to ASD (#45/3). Participant 30

mentioned that teaching assistance is particularly valuable in case of unexpected incidents, for example, when the teacher is needed to calm down a student. This participant also mentioned that it would be helpful if teaching assistants were substituted in case of sickness. Lastly, professionals who were associated with this factor also sought possibilities to collaborate with parents, as they preferred to coordinate the action plans at school with those at home (#30/3). One of the professionals (pp 37) commented that collaboration with parents "is crucial to make sure both parents and teachers behave in similar ways."

Although their focus was on collaboration, it seemed these professionals were confident about their own capabilities. They did not express the need to feel more secure when teaching students with ASD (#48/-4). They also indicated they had less need for support with regard to their contact with students with ASD inside the classroom, such as suggestions to structure the daily program and lessons (#5/-5), finding suitable rewards to reinforce positive

behavior (#17/-5), ways to help students to focus (#4/-4), and suggestions to help the student to make choices (#16/-4). The comments of the participants showed that they felt they had acquired sufficient expertise, and had no need for in-class support or suggestions.

2.2. Factor 2: "Suggestions for teaching" (n = 8)

In contrast with the first factor, the eight professionals that were part of the second factor did have a need for suggestions or tips they could use in their classroom. They said they would appreciate ideas for visual support or study aids to help students with ASD during instruction and independent classroom activities (#7/5), and they would appreciate ideas about how to adjust their instructions to the strengths of the student (#14/5). Participant 39 mentioned in this regard that he/she would like "to use the talents of the student with ASD". Participant 43 stated "research focusing on the strong points of [these] students is missing". Other suggestions these professionals would have liked are ways to deal with sensory hypo- or hypersensitivity of the student (#21/4), ideas to help the student to reflect on his/her own work (#22/4), and ideas to help other students to deal with divergent behaviors of the student with ASD (#27/4). Other distinguishing statements also showed this need for tips and suggestions, such as specialized educational materials for these students (#40/3), and ideas to help the student to be more flexible (#11/2).

Suggestions that specifically target students' behavior during the lessons were less appreciated, such as suggestions to reinforce positive behaviors of students with ASD (#17/-4), and suggestions to promote self-initiated questions of the student (#12/-3). One of the participants indicated that her "students [with ASD] are asking questions, just not at the right time" (pp 39). The input of parents, their supervisor, or an educational specialist was also less needed by these professionals (#29/-5; #31/-4; #44/-2), which is in contrast to factor 1. That said, similar to factor 1, professionals in factor 2 were confident about their didactic skills (#48/-5). Two professionals specifically mentioned this after their sorting: "I feel confident in my job" (pp 43) and "I do not feel insecure in this regard" (pp 39).

2.3. Factor 3: "Am I doing this right?" (n = 7)

The seven professionals in factor 3 clearly stood out in the sense that they would like to feel more confident/secure in their contact with students with ASD (#48/4). This need clearly deviated from the other three groups, and was also reflected in other statements they found most important, such as consulting an educational specialist about the student (#50/5), and suggestions to help distracted students back on track (#20/5). Participant 32 commented: "Advice from outside or inside the school is always nice. You cannot always see everything or give everything sufficient attention". Other distinguishing statements showed that these professionals would prefer the input of parents (#28/2), and the assistance of co-workers when students showed challenging behavior (#34/2). Interestingly, these professionals also indicated they would like suggestions for teaching, but the specific tips they preferred were different from those preferred by participants in factor 2, and seemed mostly focused on dealing with behavior they considered challenging. For example, they indicated they would appreciate strategies to give adequate feedback on the behavior of the student (#19/4), and ways to teach socially adequate behaviors to the student (#24/4).

The professionals associated with factor 3 had less need for additional pupil tracking systems (#39/-5), and a less chaotic school environment (#1,-4). Time for pre-teaching and connecting

their lessons to the student's interests was also less appreciated (#6,-4; #13/-4). As one of the participants indicated: "The curriculum is not too hard, the focus should be on contact with the student, and other things will follow" (pp 32). Other distinguishing statements showed that they also had no need for a method to organize individual instructions (#3/-3), ways to help the student to work independently (#9/-3) and ideas to help the student to reflect on his/her own work (#22/-3). Interestingly, the latter need was highly preferred by professionals in factor 2. In sum, it seemed that professionals in factor 3 were mostly focused on feeling more confident in their contact with students with ASD and responding to behavior they considered challenging.

2.4. Factor 4 "The social coach" (n = 8)

More than the professionals who associated with the other factors, the eight professionals that associated with factor 4 were focused on the social and communication skills of their students with ASD. They indicated they would like to promote self-initiated questions of the student (#12/5), as mentioned by participant 40: "I have noticed that [these] students either keep a lot to themselves, or act out (in a verbally aggressive way). Ways to stimulate these students to ask proper questions are needed." Other preferred needs were ways to support the conversation skills of students with ASD (#23/4), ways to help the student to see other people's view (#25/4), suggestions to stimulate the social activities and friendships of the student (#26/5), and ideas to help the student to collaborate with others (#15/3). Participant 2 commented that she would appreciate tips to stimulate collaboration: "Students with ASD have trouble to collaborate with other students. They try, but they often stick to their own plan." The professionals in this factor also extended their focus on social behavior to other students as well, as they indicated they would like to help other students to cope with the behavior of the student with ASD they considered challenging (#27/4). One of the professionals commented: "I find it very important that the students in my group feel united, and often students with ASD are standing on the sideline" (pp. 28).

The professionals in factor 4 did not have a need to make the school environment less chaotic (#1/-5). Participant 2 mentioned: "I always structure my lessons in the same way, and keep the classroom neatly organized, which makes it very predictable for the students." These professionals also did not need school facilities like a time-out or quiet space for students with ASD (#38/-4). This does not mean they were not using these facilities. As participant 40 commented: "We already have this in our school". The opportunity to administer tests within the school, such as intelligence tests, was also less appreciated (#42/-5). Time for pre-teaching and study aids were also less needed by these professionals (#6/-3; #7/-4). Interestingly, compared to all other groups, they had the least need for support from their co-workers (#32/-2; #33/-1, and #35/-2). Taken together, the most pressing needs of these professionals were related to stimulating the social and communication skills of their students with ASD, and they had less need for external aids or school conditions to support these students.

2.5. Demographic differences between the factors

Table 3 shows the composition of the four factors in terms of professionals' gender, age, profession, the age of their students, their years of experience, and their experience with students with ASD. In all factors the majority of the participants were female, and no factor stood out in terms of its male to female ratio. All factors contained participants who worked with students with ASD at the time of the study, or who worked with students with ASD in the past. Interestingly, most of the older professionals with the most

Table 3
Composition of the groups in terms of gender, age, profession, the age of their students, their years of experience, and their experience with students with ASD.

Factor	Male: female	Mean age (range)	Position within school	Mean age students (range)	Years of experience (range)	Experience with ASD*
1	2:10	40.33 (23−66)	teacher (9) teaching assistant (2) educational specialist (1)	9.67 (4−13)	14.36 (2−35)	current (7) past (5) future (3) other (3) no experience (0)
2	2:7	40.33 (28−53)	teacher (8) teaching assistant (1)	8.22 (4−13)	11.67 (3−31)	current (6) past (5) future (3) other (2) no experience (0)
3	1:6	27.14 (18−35)	teacher (5) teacher-trainee (2)	7.79 (4−13)	4.43 (0−13)	current (5) past (3) future (1) other (3) no experience (0)
4	0:8	36.25 (24−52)	teacher (5) social worker (1) social work intern (2)	8.31 (4−13)	9.88 (0−30)	current (6) past (1) future (1) other (2) no experience (0)

Note. * Multiple answers were possible. Seven participants (4 male, 3 female) with a mean age of 34.71 (range 24−60) did not associate with one particular factor. Five of these participants were teachers, one was team leader and one was a teaching assistant. They had on average 6.58 years of working experience (range 1−13).

working experience were part of factor 1 or 2, while factor 3 contained the youngest participants, with the least working experience. In each factor, most participants were teachers. Although the other professionals seemed to be scattered around the other factors, factor 4 contained all social work practitioners (one social worker and two interns).

2.6. Experienced barriers

Some of the educational professionals in our sample disclosed the barriers they experienced and possible ways to meet their needs. In their answers to the questions about their Q sort, teachers indicated that teaching many students simultaneously makes it harder to give students with ASD the attention they need. These teachers indicated an "ongoing trade-off" between handling their group and one-on-one time with students with ASD. One of the participants said that he/she would highly appreciate 'best practice' examples of how to manage a classroom while also giving students with ASD the attention they need. Another solution suggested by the teachers (especially those who associated with factor 1), was hiring teaching assistants or paraeducators who can manage the classroom while the teacher gives individual instruction to the student with ASD (or vice versa). In some of the schools, teaching assistants were not replaced in case of sickness, which provided an additional barrier. Finally, the lack of hands-on knowledge and skills, such as knowing how to offer their students with ASD a sense of safety in case of unexpected events, or knowing what the limits are of their stimulation of students' social skills, were barriers mentioned by the professionals in our sample.

3. Discussion

The aim of this study was to identify and distinguish groups of general education professionals with different needs with regard to supporting their students with Autism Spectrum Disorder (ASD). These students are at risk of falling behind, which may lead to considerable deficits in academic achievement, a negative teacher-student interaction spiral, and even drop-out (Lane, Barton-Arwood, Nelson, & Wehby, 2008;). It is therefore important to know what educational professionals require in order to provide these students with optimal support. To identify the needs of

educational professionals when it comes to educating students with ASD, we chose Q methodology, a qualitative method that applies quantitative techniques (Shemmings & Ellingsen, 2012). The study shows different viewpoints of groups (i.e., "factors") of educational professionals regarding their needs and indicates the differences and similarities between these groups, both in terms of their specific needs, as well as in terms of their demographic characteristics.

A four-factor solution was chosen, meaning that four groups of professionals with different needs could be distinguished. The first factor was characterized by a need for collaboration. Although the 12 participants that associated with this factor indicated they were confident about their own abilities when it comes to supporting students with ASD, they highly valued a joint responsibility to support these students within their school. The eight participants in factor 2 were also confident about their job, but indicated they would appreciate suggestions they could use when teaching students with ASD, such as visual support or study aids that may help these students. The third factor, which contained seven professionals, was characterized by participants' need to feel more confident in their contact with students with ASD, and a need for advice on how to optimally support these students. Lastly, the eight professionals that associated with Factor 4 were mostly focused on the social and communication skills of students with ASD. Although the analysis did not show any consensus statements across factors, i.e., statements that were valued equally by the factors, all factors indicated no need for textbooks with information about ASD. Hence, it seems that all groups valued practical hands-on knowledge more than general information about ASD. The exact nature of this hands-on knowledge, however, differed across the factors.

In terms of demographic characteristics, two differences stood out. First, all social work practitioners (one social worker and two interns) were part of the group (factor 4) that was mostly focused on the social and communication skills of students with ASD. This is likely due to the nature of their profession and pre-service training. Second, most of the older professionals were part of the groups that were confident about their own abilities when it comes to teaching students with ASD. In contrast, the younger and less experienced professionals were mostly part of the group that indicated a need to feel more secure when teaching students with ASD (factor 3).

When teachers feel prepared and capable, this positively

influences their students' learning progress (Darling-Hammond, 2003). However, the prevalence of students with ASD is increasing (Iovanne et al., 2003), and teachers do not always feel capable to teach these students, that is, they feel they do not have the required knowledge and skills to effectively teach students with ASD (Westling, 2010). This is especially the case when students show internalizing or externalizing problems, i.e., when they are withdrawn or act out. The "dual role of teacher versus disciplinarian" (van der Worp-van der Kamp et al., 2013, p.30) that teachers increasingly need to take upon when confronted with behavioral problems may fuel feelings of incompetence. Our study shows that especially young teachers feel less confident when teaching students with ASD. In line with this, a study by Westling (2010) among 70 primary school teachers showed that the majority of teachers indicated that they did not receive adequate preparation during teaching training, and no adequate support at the start of their career. Comparable to the results of our study, almost all teachers in the Westling (2010) study agreed that they learned to support students with behavior they consider challenging, such as students with ASD, through teaching experience. Since we cannot solely rely on older teachers when it comes to educating students with ASD, we need to critically evaluate the teacher training curriculum, and formalize support systems, such as mentoring programs for young educators. Guided field experiences in inclusive classrooms would also benefit the professional preparation of young teachers and teacher-trainees (Able et al., 2015). Research has shown that these experiences improve teacher efficacy and lead to an increased level of confidence when teaching students with special educational needs (Jung, 2007). More guided field experiences and collaboration would also prevent attrition of young educators (Darling-Hammond, 2003). Indeed, in our study, one of the participants said that she would highly appreciate 'best practice' examples of how to manage a classroom while also giving students with ASD the attention they need.

The chosen four factor solution explained 38% of the total variance within our sample. Seven participants did not significantly associate with a factor. The participants who did load significantly on a factor, showed factor loadings ranging from 0.32 to 0.74. Combined, these results show that there is ample variation within the sample. That is, although meaningful groups of professionals with similar needs could be formed, the needs of the educational professionals were also variable and personal. Furthermore, the needs of individual students with ASD are also likely to vary, which influences both their teacher's needs and their own learning outcomes. In order to optimize both teacher and student need satisfaction, it may be worthwhile to focus on specific teacher-student pairs. Until now, however, such research focusing on teacher-student interactions is scarce (Corno, 2008), especially when it comes to students with special educational needs. Yet, such studies can provide important implications to support teachers and students with ASD alike. For instance, a case study of Steenbeek et al. (2012) showed that a problematic learning trajectory of a student with special educational needs could be associated with a considerable number of teacher's self-iterations, indicating that the teacher often took over the student's learning task. In future work, it would be interesting to combine such data on teacher-student interactions with an analysis of the teacher's needs. Does the teacher in the Steenbeek et al. (2012) study, for example, indicate a need for suggestions or tips that can be used while instructing students with ASD?

3.1. Strengths and limitations

Earlier studies indicated that the needs of general education professionals and the relative importance of their needs differ depending on their characteristics, their experience, and the specific teaching context (cf. Able et al., 2015; Iovanne et al., 2003). By using Q methodology as a framework, we could identify and distinguish different needs perspectives among educational professionals. That is, we could assess which needs were the most or least important to the professionals, and we could investigate differences and similarities between groups of professionals (i.e., the factors). In addition, the participants had the opportunity to elaborate on their most and least important statements, which gave us additional information about (the reason behind) their needs. Yet, while the sample size is sufficient for a Q methodological study (Watts & Stenner, 2012), viewpoints other than those of our participants may exist. Furthermore, our sample did not only contain teachers, but also other educational professionals, such as teaching assistants, trainees, and social workers. While this could be considered a strength, the teachers clearly outnumbered the other educational professionals, making the latter underrepresented in our study. Interestingly, all factors included both teachers and other educational professionals, showing that their viewpoints do not seem to be determined by their position in the schools, apart from the social work practitioners, who seemed to have similar needs.

3.2. Implications and future directions

The prevalence of students with ASD is increasing (Iovanne et al., 2003), and teachers do not always feel capable to teach these students (Westling, 2010). When educational policies change—for example, the worldwide trend toward more inclusive education—we must be aware that this may also impact the needs of educational professionals.

Until now, a differential view of the needs of educational professionals with regard to supporting students with ASD was relatively understated in the literature (Able et al., 2015). That is, most studies focused on teachers' attitudes (e.g., Avramidis et al., 2000), teaching strategies (e.g., Florian & Black-Hawkins, 2011; Iovanne et al., 2003; Lindsay et al., 2014; Park et al., 2010), or the challenges they experience when teaching students with special needs (e.g., De Boer et al., 2011; McCray & McHatton, 2011; Van der Worp-; Van der Kamp et al., 2013; Westling, 2010). Although these studies have yielded a general view of the needs of educational professionals when it comes to teaching students with ASD, they have not shed light on the ways in which teachers differ with regard to the support they would particularly appreciate. Yet, our study showed that the needs of educational professionals can be very diverse, ranging from educational professionals who value collaboration, and those who prefer suggestions to improve their teaching, to a group of teachers who would like to feel more secure when teaching students with ASD, and a group of professionals who would like to boost their student's social skills. From earlier studies, we know that teachers value practical, hands-on knowledge and 'best practices' examples. The current study shows that the exact nature of this hands-on knowledge differs across teachers.

A first step to provide these teachers with adequate support may therefore be to assess their needs when they are confronted with students with ASD in their classroom. Meeting the needs of educational professionals will benefit both the professional and the student, as it makes teaching and teacher-student interactions easier. Alternatively, teachers' needs with regard to teaching students with special educational needs, and students with ASD in particular, can be assessed when they finish teacher training. Our study shows that feeling more confident when interacting with students with ASD and strategies to approach students when they consider their behavior challenging were among the most important needs of a group of younger educational professionals. Meeting these needs may help them to successfully start their career and

may also prevent teacher attrition (Darling-Hammond, 2003).

CRediT authorship contribution statement

Steffie Van Der Steen: Funding acquisition, Conceptualization, Methodology, Formal analysis, Writing - original draft. **Carla H. Geveke:** Funding acquisition, Conceptualization, Data curation. **Anne T. Steenbakkers:** Formal analysis, Writing - review & editing. **Henderien W. Steenbeek:** Funding acquisition, Writing - review & editing.

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Appendix A. Supplementary data

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