In-service education and training for teachers regarding autism spectrum disorder: a review of the literature

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Abstract

This paper discusses the published literature regarding training for teachers with regard to autism spectrum disorder (ASD). A critical literature review was carried out of papers published in English regarding this topic over the past 20 years as part of the mapping activity undertaken to develop a training programme for teachers in Croatia, Poland and North Macedonia. The review identified that the published literature can be categorised in three broad groups: rights-based literature, needs-based literature and literature regarding specific approaches. Key themes are discussed and key messages are explored. The literature suggests that though policy and legislation promote inclusion of students with ASD in education, many teachers feel unready and unskilled to teach them. The need for classroom-relevant training is identified, and for teachers to be provided with a range of strategies and skills to support the needs of these learners.

Introduction

The characteristic learning needs and behaviours of students with autism spectrum disorders (ASD) have presented a challenge to educators, and educational systems, across all countries and continents (Falkmer et al., 2015; Finke et al., 2009; Lindsay et al., 2013). Effective screening and diagnostic services are, of course, essential to identify students as being on the autism spectrum, and may present the first step in promoting their inclusion in education by

identifying their unfulfilled needs (Cepanec et al., 2015). However, it is equally essential that teachers and others working with such students understand their characteristic needs (e.g. the requirement for clarity of language, structure, visual cues or sensory-appropriate physical environment) and the difference that addressing these needs can make in the successful implementation of inclusive education. To provide high-quality education to all students and meet their needs appropriately, teachers in mainstream and special schools need to be provided with appropriate support and training, including opportunities to extend their knowledge and develop their skills in teaching students with ASD.

This literature review was conducted within the *Autism Spectrum Disorder – Empowering and Supporting Teachers (ASD-EAST)* Erasmus+ project. ASD-EAST is a two-year project focused on empowering specialist teachers working with children with ASD in Croatia, North Macedonia and Poland to support the effective inclusion of such children in education – in mainstream or special education classes – by providing them with appropriate knowledge, effective strategies and locally-appropriate training. While legislation within these countries supports the educational inclusion of students with ASD, research there has identified a number of limitations (Bukvić, 2014; Ombudsman of the Republic of Macedonia, 2014; Sekušak-Galešev et al., 2015; Starczewska et al., 2011) and the need for professionals to be trained in specific approaches (Stošić et al., 2016).

Recent studies in the project countries have investigated topics such as trainee psychologists' understanding of ASD (Kossewska & Sarlej, 2018) and the experience of parents of children with ASD (Lisak et al., 2017; Troshanska et al., 2018). However, the project's initial needs analysis identified that no previous research had investigated the needs of training teachers in Croatia, North Macedonia and Poland with regard to supporting the educational inclusion of

children with ASD. Therefore, a necessary first step towards the successful implementation of the project was to identify the current 'state of the art' regarding teacher training about ASD: what is the literature concerning this topic and what does it tell us?

Methodology

The literature regarding teacher education/training in autism is highly varied, with a range of different methodologies, areas of focus and outcome measures, and based in many cases upon small sample sizes and single subject designs. The decision therefore was made to reject a systematic review approach, which might preclude the use of much of this existing literature, and instead to utilise a critical review methodology (Croom et al, 2000). Key word searches – using combinations of the key words *autism*, *autism spectrum disorder*, *teacher*, *training* and *education* – were conducted using the following databases: Education Research Complete (EBSCO), Google, Google Scholar, Ingenta Connect, Science Direct and Web of Science. The literature reviewed included not only academic journal articles but also governmental reports and professional literature that included research.

Articles were initially identified by their title and abstract, the main criteria being ASD-specific teacher training (rather than teacher training about inclusion in general), and the evaluation of such training (as opposed to evaluation regarding specific intervention methods). Articles which described teaching methods for children with autism but did not consider teacher training were also excluded. A full list of inclusion and exclusion criteria is shown in Table 1.

Table 1
Inclusion and exclusion criteria used within this literature review

Inclusion criteria	Exclusion criteria
• Teachers working with students with ASD in mainstream or special schools • Focus on further teacher education and training • Relates to teachers' attitudes, knowledge, challenges and needs related to inclusion of and teaching students with ASD • Study design: theoretical / literature review, quantitative, qualitative • Published within academic journals, survey reports, governmental reports, books • Published in English • Published since 1999 (last 20 years)	• Professionals working with children with ASD other than teachers (e.g. therapists) • Recommendations or examples of good practice about teaching students with ASD • Focus on teacher training about special educational needs other than ASD, or inclusion in general • Descriptive accounts without evidence • Newspaper articles, project/training descriptions, marketing materials • No research data provided or methodology • Published in other languages • Published before 1999

Findings

The review identified a number of studies, predominantly from the United Kingdom and the United States. The studies were read by both authors, and were grouped within three broad thematic categories:

- Studies which discussed teachers' attitudes towards ASD, and other related issues such as school ethos and aspirations (n = 12): these are summarised in Table 2.

- Studies which discussed issues concerning teachers' knowledge and skills about ASD and related training needs (n = 10): these are summarised in Table 3.

- Studies regarding teacher training regarding ASD-specific methods and interventions (n = 7): these are summarised in Table 4.

Some of these studies have multiple foci and are included in more than one thematic category. A number of studies (n = 8) further made specific reference to process and format issues with regard to teacher training regarding ASD. These are summarised in Table 5.

Teachers' attitudes towards ASD, school ethos and aspirations

Sources which included a focus on teachers' attitudes, school ethos and aspirations tended to be informed by a rights-based perspective, clustering conceptually around the theme of inclusion as a societal right. These are summarised below in Table 2.

Table 2
Studies with a focus on attitudes

Authors / Study	Overall focus	Research design	N	Country
APPGA (2017)	Autism and education in England	Online surveys Oral panels Written submissions	176 young people 2,573 parents/carers 308 teachers 19 oral panel witnesses	UK
Bond et al. (2016)	Educational interventions for children with ASD 2008–2013	Systematic literature review	85 studies (quantitative and qualitative)	11 countries (65 from US, 7 from UK)
Busby et al. (2012)	Teachers' self-efficacy; perceived challenges and needs	Nominal Group Technique (NGT)	31 graduate students	USA
Charman et al. (2011)	Good practice in autism education	Staff interviews Parent focus group Parent interview Student interviews Qualitative thematic analysis	16 schools 29 staff 7 parents 11 students	UK
Humphrey & Symes (2013)	Perceptions of inclusion, experience and knowledge, copying with behaviours, benefits and challenges of inclusion	Cross-sectional survey (quantitative and qualitative data)	11 schools 53 participants (21 male, 32 female)	UK
Jordan et al. (2001)	Effective educational interventions	Policy and practice review	n/a	UK

Loiacono & Valenti (2010)	Numbers of students with ASD and teacher training in ABA	Questionnaire	14 Local Educational Agencies reporting on 365 students and 135 teachers	USA
McCabe (2008)	Specific on the job teacher training model in one school	Qualitative observations and semi-structured interviews	19 school staff interviewed 10 teachers observed over 9 months	China
Morrier et al. (2011)	Training regarding ASD received by teachers	Online Autism Treatment Survey	185 teachers	USA
Symes & Humphrey (2011a)	Experiences of teaching assistants supporting pupils with ASD	Qualitative phenomenological research Semi-structured interviews	15 teaching assistants	UK
Stahmer et al. (2015)	The use of evidence-based interventions in schools	Quantitative Structured observation	57 teachers (first year) 38 teachers (second year)	USA
Wermer et al. (2018)	Efficacy of a specific training package	Experimental design	1 teacher 1 paraprofessional 1 student	USA

The literature within this thematic category suggests that there are a number of attitudinal foundations which underpin the successful inclusion of students with ASD in education. To support their participation and meet their diverse needs, it is essential initially to raise awareness regarding ASD, and to ensure the presence of inclusive attitudes and an inclusive ethos throughout the school environment. Though teachers within this literature are reported to have generally positive attitudes towards inclusion in general – and the inclusion of students with ASD in particular – challenges are nonetheless identified regarding teachers' and other professionals' confidence in teaching students with ASD (Charman et al., 2011; Humphrey & Symes, 2013; Symes & Humphrey, 2011a).

A study commissioned by the Autism Education Trust (AET) in the United Kingdom (Charman et al., 2011) identifies a number of positive characteristics felt to contribute towards 'good autism practice' in schools. These include having high ambitions and aspirations for students with ASD, being interested in hearing the students' voice, and investing time to establish positive relationships with their students. A further important attribute of good practice is the presence of an individualised and adapted curriculum, with a focus on social, emotional and communication need as well as the more traditional curriculum.

It is noteworthy that teachers who participated in the AET study were described as highly trained, motivated and dedicated. Similar findings were reported by McCabe (2008) regarding a specialist educational setting in China, where research identified highly qualified, enthusiastic and knowledgeable teachers who valued further teacher education. Humphrey and Symes (2013) have also identified a strong willingness to develop knowledge and expertise among secondary school teachers in the UK. Training for whole school teams is identified as valuable in developing a positive ethos and ensuring consistency of practice, and the important role that schools can play in raising awareness within their wider communities has been acknowledged.

Charman et al. (2011, p. 6) identify that a number of schools whom they felt exemplified good practice in ASD *"went further than individualising and adapting the curriculum for each pupil. They saw the need for a unique 'autism curriculum', which captured not only children's learning needs but also sought to address the social, emotional and communication needs of children and young people with autism, and to nurture their independence and well-being."* However, suggesting the need for an ASD-specific curriculum may seem to imply that educating students with ASD requires a specialised

approach, and should be undertaken only by 'experts in ASD'. This attitude was found among teachers within the USA by Busby et al. (2012), where respondents in their study believed that teaching children with ASD was a specialized process requiring highly specialized skills and qualities. Loiacono and Valenti (2010), in another US study, further identify that many teachers in mainstream settings felt unprepared and under-skilled to teach students with ASD.

In summary, studies that included an attitudinal focus identify that teachers' attitudes towards children with ASD are crucial in assuring their educational inclusion. Therefore, such issues must be considered when designing teacher training regarding this topic. However, even where teachers' attitudes are positive, they may still lack the knowledge and skills needed to translate inclusive attitudes into their everyday teaching practice, resulting in a reliance upon others and requests for specialised support for the children.

Teachers' knowledge and skills

A further subset of the literature clustered thematically around teachers' knowledge and skills with regard to the needs of children with ASD. These are summarised below in Table 3.

Table 3
Studies with a focus on knowledge and skills

Authors / Study	Focus	Research design	N	Country
Busby et al. (2012)	Teachers' self-efficacy; perceived challenges and needs	Nominal Group Technique (NGT)	31 graduate students	USA

Charman et al. (2011)	Good practice in autism education	20 staff interviews 1 parent focus group 1 parent interview 11 student interviews Qualitative thematic analysis	16 schools 29 staff 7 parents 11 students	UK
Guldberg et al. (2017)	Autism awareness; practical strategies and approaches; mentoring	Mixed methods (Value Creation Framework)	1800 school staff	Greece Italy
Helps et al. (1999)	Evaluating knowledge and understanding of ASD	Questionnaire	4 mainstream schools 4 special schools 72 teaching and support staff	UK
Jennett et al. (2003)	Burnout in teachers	Questionnaire	34 teachers using ABA 30 teachers using TEACCH	USA
Jones et al. (2009)	Educational provision for students with ASD in England	Questionnaire Interviews Literature review Document analysis	Not identified	UK
Leblanc et al. (2009)	The influence of ABA training sessions on a group of beginning teachers	Pre- and Post-test using ASD Inventory	73 undergraduate students in teacher training	Canada
Ravet (2018)	Initial teacher education	Qualitative Open-ended questionnaires and focus groups	16 tutors 73 students of ITE	UK
Scheuermann et al. (2003)	Problems with ASD specific teacher trainings	Analysis of policy and practice	n/a	USA

Symes & Humphrey (2011b)	Contribution of teaching assistants to inclusion of students with ASD	Qualitative Thematic analysis of interviews	15 teaching assistants	UK

ASD impacts all areas of an individual's experience, including social interaction, communication and sensory processing as well as their cognitive and learning style (Chen et al., 2009). It is therefore imperative that teachers have a sound and accurate understanding of the nature of ASD, and appropriate skills. However, the literature suggests that this is often not the case. Busby et al. (2012) identify a shortfall in US teachers' knowledge and skills to successfully include children with ASD, and Scheuermann et al. (2003), also researching within a US context, discuss the need to raise teachers' awareness regarding effective curriculum and teaching strategies. This shortfall is unsurprising given the limited training regarding ASD provided to teachers in the USA. According to the findings of Morrier et al. (2011), while most teachers have received a full- or half-day training, fewer than 15% have received college or university training, and fewer than 5% have been trained in carrying out evidence-based practices or approaches suitable for teaching students with ASD.

A recent UK parliamentary report identifies that one in four teachers received training regarding ASD during university, and eight in ten received some form of in-service training (APPGA, 2017). It has however been identified that training for teachers in the UK can be fragmented, and that it is often neither evidence-based nor evidence-informed (Bennett, 2013). Analysis of initial teacher trainings in the UK reveals that though both students and tutors have basic autism awareness, they possess little knowledge or understanding of specific teaching strategies for students with ASD (Ravet, 2018). Mainstream teachers have been identified as having a lower level of knowledge than those in special education settings,

and may be less aware of training that may be available (Helps et al., 1999). Overall, fewer than five in ten teachers feel confident supporting students with ASD; and the need for a national autism and education strategy – which included training for all school staff – has been asserted (APPGA, 2017).

It has been identified that teachers' self-efficacy is raised when they are committed to and understand the underlying theoretical orientation of their teaching approach (Jennett et al., 2003). This may be achieved through becoming confident and competent in the use of a specific strategy; for example, training teachers in ABA was identified as having a number of benefits. Teachers increased their understanding of and knowledge about ASD and evidence-based practice. Teacher stress and anxiety when integrating students with ASD into mainstream classrooms was reduced. Furthermore, teachers were more able to utilise professional support to meet the needs of such students (Leblanc et al., 2009). However, Scheuermann et al. (2003) argue that teachers need specialized skills in multiple approaches, and warn that being trained in and then applying one approach only carries a risk of belief that one approach will work for all. Jones et al. (2009), writing in a UK context, similarly recommend that teachers should be trained in the use of an eclectic range of approaches.

The employment of teaching assistants – either to support specific individual students or more generically within the classroom – represents an important supportive strategy in the educational inclusion of many students with special educational needs, including many of those with ASD (Webster et al., 2011). However, Symes and Humphrey (2011b) identify that many teaching assistants in the UK working in this area have limited competence in supporting students with ASD. The level of training they received was extremely variable and generic training regarding ASD was not considered helpful in the classroom. The ability of

teaching assistants to effectively include students with ASD has been shown to be influenced by access to expertise, communication with school and teaching staff awareness of ASD (Symes & Humphrey, 2011a). Wermer et al. (2018) further identify that paraprofessionals and teaching assistants can be trained by classroom teachers to effectively implement evidence-based practices to promote use of alternative/augmentative communication, supporting the concept of knowledge- and expertise-sharing in inclusive education.

This section of the literature identifies the importance of teachers and other classroom professionals having an accurate understanding of ASD – to provide them with a theoretical framework – as well as being able to deploy a range of 'autism-friendly' approaches to meet the needs of diverse range of children they may teach. In the next section we move on to consider the literature regarding such approaches.

Studies regarding specific approaches and methods

In this section about practice we move on to consider the literature regarding the use of specific intervention approaches or methods used to support students with ASD (see Table 4).

Table 4
Studies regarding specific approaches and methods

Authors / Study	Focus	Research design	N	Country
Downs & Downs (2012)	Effectiveness of DDT instructor training	Pre- and post-training assessment	8 instructors 6 children	USA
Jennett et al. (2003)	ABA TEACCH Burnout in teachers	Questionnaire	34 teachers using ABA 30 teachers using TEACCH	USA
Leblanc et al. (2009)	The influence of ABA training sessions on a group	Pre- and Post-test using ASD Inventory	73 undergraduate students in teacher training	Canada

	of beginning teachers			
Lerman et al. (2008)	Brief, intensive teacher-training model	Pre- and post-training observations in classrooms	9 special education teachers	USA
Loiacono & Valenti (2010)	ABA Over 96 % of teachers working with students with ASD did not receive training in ABA during their studies	Questionnaire	14 Local Educational Agencies reporting on 365 students and 135 teachers	USA
Probst & Leppert (2008)	Effectiveness of teacher training in TEACCH	Pre- and post-questionnaires	10 teachers	Germany
Robledo (2017)	Focus on literacy and inclusive framework, student-teacher relationships, understanding individual students	Qualitative analysis of workshop and discussion observation + written participant reflections	63 teacher candidates in three groups of 20-22 participants	USA

Literature regarding teacher training in ASD has often focused on a specific approach identifying the positive impact of such training on practice. Approaches regarding which studies have been undertaken include Applied Behavioural Analysis (ABA) (Leblanc et al., 2009; Loiacono & Valenti, 2010), Treatment and Education of Autistic and Related Communication Handicapped Children (TEACCH) (Probst & Leppert, 2008), Discrete Trial Training (DTT) (Downs and Downs, 2012), and a combination of ABA and TEACCH (Jennett et al., 2003). Further approach-specific studies have focused on techniques for managing the behaviour of students with ASD, following behavioural approaches (Lerman et al., 2008), as well as investigating teacher training to support the literacy skills of students with ASD through building student-teacher relationships and understanding individual students (Robledo, 2017).

Further studies have investigated more general teacher training in ASD. The content of these has focused on a gamut of different topics. These include: psychological theory and knowledge, child development, games, music/movement, fine motor activities, ABA and DTT (McCabe, 2008); underpinning knowledge about autism, teaching strategies, TEACCH, communication systems, sensory integration and behavioural management techniques (Charman et al., 2011); interpersonal relationship interventions, skill-based interventions, cognitive strategies, physiological, biological, neurological interventions, other interventions and model programmes (Morrier et al., 2011).

Howley and Preece (2013) argue the importance of shifting focus onto diversity rather than impairment, stressing the importance of issues such as developing effective partnerships between schools and families, and providing appropriate support for teachers in areas that they are typically identified as challenging, e.g. behaviour management, the use of structure, peer support, and transitions. With regard to improving curriculum access for students with ASD, Fortuna and Ince (2013) recommend that teachers should be trained to differentiate lesson objectives, content and teaching styles as well as supporting student group work. They also stress the importance of effectively planning how teaching assistant support will be utilised. Jordan et al. (2001) further emphasize the importance of supporting students with ASD across the whole range of transitions that they experience – from home to school, from one class to another – and in less-structured 'free-play' sessions as well as in formal lessons.

The areas in which teachers identify their need for training are those that they perceive as most challenging in their practice. The need for a firm understanding of ASD is identified, as well as the need to know how to facilitate group work with children with ASD (Helps et al., 1999). Whitaker and Preece (2013) discuss the importance of building positive relationships between

schools and families; and developing teachers' skills regarding the process, procedures and practices for teacher and family collaboration for effective inclusion are identified as a key training need (Busby et al., 2012). Humphrey and Symes (2013) further identify that communication is perceived as a key problem area, while the most difficult needs of students with ASD to manage include the inappropriate display of emotions, heightened anxiety and poor turn-taking skills.

Process and format of teacher trainings

A number of the papers reviewed discuss issues relating to the process and format of training for teachers with regard to ASD. These are summarised in Table 5 below.

Table 5
Process and format issues

Authors / Study	Content	Duration	Method of delivery	Participants	Country
Downs & Downs (2012)	DDT	One 8-hour training		8	USA
Guldberg et al. (2017)	Autism awareness; practical strategies and approaches; mentoring	Level 1: 2-3 hrs Level 2: 8 hrs Level 3: 10 hrs	Direct teaching + resources on website	1800 school staff	Greece Italy
Leblanc et al. (2009)	Understanding autism, communicative styles, functional behavioural analysis, ABA, stress and anxiety experienced by students with ASD teaching strategies, teaching social skills	200 minutes (3 hours)		105 training participants (73 evaluated)	Canada

Lerman et al. (2008)	Reinforcer identification, direct teaching, incidental teaching	5-day summer training programme	Lectures, discussions, role play, modelling and practice with feedback	18 participated in training in 3 separate groups (9 evaluated)	
McCabe (2008)	Theoretical knowledge of child development, autism, ABA, DTT + hands-on training	Three months - theoretical from daily to weekly - practical from three times per week to daily	Lectures, discussion and reflection Training instruction while working with students	10	China
Morrier et al. (2011)	Cognitive teaching strategies (37% through workshops) Skill based strategies (22% through workshops)	Full-day and half-day workshops (21%) Hands-on training (19%) Self-taught (18%) University (15%)	Didactic presentations	90	USA
Probst & Leppert (2008)	TEACCH	Six 30-min sessions over 6 months	Individual training sessions in the classroom	10	Germany
Ravet (2018)	ASD training in Initial Teacher Education	1-hour lecture and 1,5-hour workshop	Lecture and workshop	73 students	UK

The teacher training events reported on within the published research literature have been undertaken using a range of delivery methods, and some authors evaluated and/or reflected on the methods utilised. Lerman et al. (2008) combined more traditional modes of delivery such as lectures and discussions with role play, modelling and practice with feedback, through which they provided a variety of experience to address differing expectations and learning needs of the trainees. Similarly, Probst and Leppert (2008) utilised video and slide presentations, exercises in creating structured teaching material (e.g. daily schedules, work

systems) combined with group discussions, with the goal to provide teachers with practical skills. 'Hands on' instruction in the classroom, modelling and discussion, as well as respecting the views and experiences of all teachers, have been suggested as important factors in effective teacher preparation (McCabe, 2008). Working alongside trained specialists, learning by observation and 'hands on' experience have also been identified as useful strategies by more experienced teachers, while some teachers have found it helpful to undertake visits to schools catering specifically for children with ASD (Helps et al., 1999).

Due to the commitments and workload issues of teachers, the trainings offered have tended to be of short duration, e.g. 6 x 30-minute sessions (Probst & Leppert, 2008), 200 minutes (LeBlanc et al., 2009). However, according to Downs and Downs (2012), such short-term in-service trainings were evaluated as lacking comprehensive understanding and therefore result in a need for additional support and supervision post-training.

Some studies report upon the forms of training that teachers would prefer. They report a desire for more case- and field-based experience with examples of good practice, as well as access to current research and best practice teaching strategies. Goal-oriented activities have been requested to learn how to support inclusion (Busby et al., 2012), as well as practical advice and support regarding behaviour management and teaching methods (Helps et al., 1999). Case studies have been identified as essential teaching tools in initial teacher training (Ravet, 2018) with a particular importance for rural areas due to low availability of quality experiences in inclusive settings (Busby et al., 2012). Guldberg et al. (2017), reporting on the teacher training project Transform Autism Education in Greece and Italy, emphasize that training processes should be based on the trainees' specific interests and knowledge, using a

'learning by doing' approach with flexible strategies and culturally and contextually relevant content.

Benefits of training

Jennett et al. (2003) argue that appropriate training leads to improved self-efficacy of teachers and may prevent staff burnout; while Busby et al. (2012) suggest that teachers' perception of their self-efficacy impacts upon their ability to positively accept challenges. This assertion regarding training minimising burnout is supported by wider literature within the field of ASD (Coman et al., 2013; Kraemer et al., 2008). As teachers are increasingly required to implement evidence-based interventions in education, a number of studies have been carried out into the fidelity of their use. The results identify that teachers can learn to apply evidence-based strategies, with highly structured strategies being easier to learn. However, training, coaching and time can be required to reach and maintain moderate procedural implementation fidelity, especially with regard to more naturalistic strategies (Stahmer et al., 2015). Downs and Downs (2012) present similar results, noting that trainings must be supplemented by performance feedback with the need to focus on the ability to correctly use the learned procedures.

Discussion

This review regarding teacher education in ASD revealed a number of key themes, which are discussed within the research literature either as examples of good practice, challenges, or identified training needs. The first focuses on teachers' general skills and confidence in teaching students with ASD. Further themes relate to the need for effective collaboration – with other teachers, other professionals and families – whilst others relate to specific

classroom issues: supporting communication, managing challenging behaviour, and making

appropriate adaptations and modifications to support learning (see Table 6).

Table 6
Key themes emerging from the literature

Theme	Area of skill
• Teachers' knowledge, skills and confidence	• General teaching skills
• Collaboration with other teachers • Collaboration with other professionals • Collaboration with families	• Collaboration skills
• Communication and social skills of students with ASD • Managing challenging behaviour of students with ASD • Adaptations and modifications of teaching and learning for students with ASD	• Specialised skills

General teaching skills

With regard to teachers' knowledge, skills and confidence in teaching students with ASD,

examples of good practice and of the positive impact of teacher training are identified across

several countries (Charman et al., 2011; Jennett et al., 2003; Howley & Preece, 2013;

McCabe, 2008; Robledo, 2017). However, challenges such as lack of skills (Busby et al.,

2012) are also identified, alongside the need for teachers to have a deeper and fuller

understanding of ASD (Busby et al., 2012; Guldberg et al., 2017; Helps et al., 1999).

Collaboration skills

Teaching students with ASD requires teachers to engage in collaborative activities with a

range of professionals across multidisciplinary teams, as well as with parents and other

family members (Stahmer et al., 2011). Therefore, collaboration is a key skill that teachers

require for the effective inclusion of their students. Collaboration with other teachers is frequently identified as a strength, with teachers maintaining respectful relationships (McCabe, 2008) and sharing knowledge gained regarding the successful implementation of inclusive practice (Morewood et al., 2011). At the same time, collaboration with other teachers is also often identified as a challenge, being time-consuming and difficult (Busby et al., 2012); nonetheless it is considered essential in order to raise awareness of effective strategies among the teaching staff team (Scheuermann et al., 2003).

Examples of good practice with regard to multidisciplinary collaboration include involvement of early intervention specialists (Jordan et al., 2001), joint working with health practitioners (Charman et al., 2011), communication of teaching assistants with schools (Symes & Humphrey, 2011b) and teachers acting as trainers of teaching assistants (Wermer et al., 2018). Again, challenges are identified, such as lack of special educators in the USA (Scheuermann et al., 2003) and the lack of experience and the limited generic training of teaching assistants in the UK (Symes & Humphrey, 2011a).

Effective collaboration with families is another key skill required of teachers (Whitaker, 2002; Whitaker, 2007; Whitaker & Preece, 2013). Examples of good practice in this area includes the meaningful involvement of parents and carers (Jordan et al., 2001), sharing materials produced by schools describing their practice with parents and informing parents about decision-making processes (Jones et al., 2009), and partnerships with families that are based on reciprocal communication, providing additional support for vulnerable families (Charman et al., 2011). The significant challenges that can exist regarding collaboration with parents have also been identified (Busby et al., 2012), making the provision of training in effective family collaboration a priority.

Specialised skills

Three themes captured in the research studies relate to more specialised skills of teachers. The first focuses upon communication and social skills of students with ASD. Examples of good practice – supporting curriculum access in ways that are not dependent on the student's communicative skills – are identified, as well as strategies for teaching social skills and understanding (Jordan et al., 2001). Challenges in this area are discussed by Humphrey and Symes (2013), with communication difficulties being identified by teachers as the most challenging issue related to autism for them to deal with. As identified above, Charman et al. (2011) write of the need for teachers to specifically target social, emotional and communication skills.

Managing the behaviours presented by children with ASD can be particularly challenging for teachers as they may be atypical, complex and potentially disruptive (Busby et al., 2012), and often linked to heightened emotions and anxiety (Humphrey & Symes, 2013). Different research studies have suggested different solutions to this challenge. Examples of positive practice include the use of functional behavioural assessment and approaches (Jordan et al., 2001). Ravet (2018) identifies the need for knowledge and understanding regarding effective teaching strategies, and Jones et al. (2009) recognise the positive impact and effective practice that can ensue when teachers are trained and skilled in more than one intervention approach, developing a 'toolbox' of approaches (Dunlop et al., 2010). Scheuermann et al. (2003), like Downs and Downs (2012), emphasise that teachers need to be skilled in multiple approaches, while Loiacono and Valenti (2010) have recommended training teachers in ABA techniques. Bond et al. (2016) state that peer-mediated interventions and multi-component social skills interventions in education provided most supportive evidence.

The final theme connected with classroom-specific skills was focused on adaptations and modifications of teaching and learning. Examples of good practice included spatial and temporal structuring of environment through TEACCH (Probst & Leppert, 2008), supporting transitions to new classes and individualising adaptations to address the specific needs of students (Jones et al., 2009). Morewood et al. (2011, p. 64) have positively evaluated the 'saturation' model in mainstream education, arguing that *"to be effective, inclusive principles and practice need to permeate every aspect of life in school; thus, in order to be 'autism friendly', the school needs to be saturated in autism understanding and awareness."* Teachers identify further challenges with regard to working with children with ASD across a range of mixed abilities and in group situations (Helps et al., 1999), as well as those connected to writing and implementing individual plans for students with ASD (Busby et al., 2012).

Conclusion

As is evidenced in this review, research documenting teacher training in autism specific educational practices is relatively sparse. Nonetheless a number of key messages are clearly identified. While policy and legislation across the globe speak of the importance of inclusion, it is clear that this political and philosophical ambition is often inadequately resourced, and that teachers often lack the knowledge, skills, and confidence to translate such inclusion into practice. Evidence of good practice exists, and such evidence must be developed and shared effectively with teachers. At the same time, there are a wide range of challenges to the effective inclusion of students with ASD. Again, the literature clearly identifies key issues and the key skills required by teachers – e.g. in collaboration, and in managing behaviour and teaching social and communication skills – and such topics will be crucial in any programme

of training for teachers. Though some studies focus on single approaches, the overwhelming body of research identifies the need for teachers to be skilled in a spectrum of approaches, and to have a 'toolbox' of strategies, to appropriately address the spectrum of need in ASD. While underpinning knowledge about ASD and an understanding of theory is identified as important, teachers appreciate 'hands on' training, and training that provides them with practical strategies to use in their day to day pedagogic activity.

The findings of the literature review are significant in part because they demonstrate the lack of previous research within the region in which the ASD-EAST project is being undertaken: Central/Eastern Europe and the Balkans. This literature review informed the development of a survey tool, to identify the knowledge, attitudes and confidence regarding ASD of specialist teachers in the project countries. The study undertaken using this tool (Lisak et al., in preparation) will provide useful data to fill this vacuum in the literature. Furthermore, the analysis and synthesis of data collected via the literature review and survey will inform the development of a teacher training curriculum and materials to support specialist teachers in both mainstream and special education settings. These materials will address the identified training needs and will be used on an ongoing basis by the project partners.

The number of children identified with ASD is increasing in all countries (Matson & Kozlowski, 2011) and increasing awareness and changing diagnostic practice are leading to a broader range of individuals receiving a diagnosis (King & Bearman, 2009). Autism specific teacher training is becoming significantly important as many countries around Europe are adopting and implementing new inclusive policies in education. Teachers in both special and mainstream settings may currently feel unskilled to meet the challenges posed by such policies (Emam & Farrell, 2009; Loiacono & Allen, 2008). The provision of appropriate and

effective training to teachers is an essential prerequisite to support the inclusion of these students.

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In-service education and training for teachers regarding autism spectrum disorder: a review of the literature

Abstract

This paper discusses the published literature regarding training for teachers with regard to autism spectrum disorder (ASD). A narrative literature methodology was utilised to review papers published in English regarding this topic over the past 20 years, as part of the mapping activity undertaken to develop a training programme for teachers in Croatia, Poland and North Macedonia. The review identified that the published literature can be categorised in three broad groups: rights-based literature, needs-based literature and literature regarding specific approaches. Key themes are discussed and key messages are explored. The literature suggests that though policy and legislation promote inclusion of students with ASD in education, many teachers feel unready and unskilled to teach them. The need for classroom-relevant training is identified, and for teachers to be provided with a range of strategies and skills to support the needs of these learners.

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