

Teachers' Knowledge Regarding Autism

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The increasing number of students with autism spectrum disorder (ASD) in mainstream education environments require teachers to know how to identify their needs, being capable to adapt their education processes and make their inclusion easier. Therefore, it is necessary that the initial and continuous training of teachers include content and skills related to the education of children with ASD. Research results carried out on this topic suggest that teachers' knowledge of ASD is poor. It depends on the education stage (being higher in early childhood teachers and in University professors), prior training and possible prior contact with students with ASD.

Keywords: autism spectrum disorder ; teacher education ; inclusive education

1. Introduction

The world is rapidly changing, and within the education field this generates some questions regarding the needs of every single student^[1]. Commitment to inclusive education has increased for everyone—regardless of disability—since UNESCO's Salamanca Statement. Adherence to an inclusive rights-based perspective is associated with a greater presence of students with disabilities, including autism spectrum disorder, in regular classrooms^[2]. All teachers play a crucial role in the inclusion of children, teenagers, and young people. Teachers' knowledge about ASD is necessary as many of them can act as knowledge broadcasters of social change towards an inclusive education^[3]. In this way, sustainable education, and the purpose of ensuring inclusive and equitable education, as well as promoting lifelong learning opportunities for every single person are key points for high-quality education of students with special needs^[4]. Sustainable goals require that teachers have the appropriate tools to handle this new and current reality. That is why teachers, as the focal providers of education, must be aware of the benefits of adopting inclusive approaches in education. This awareness depends on intensive training, continuing professional development and improving their knowledge^[5].

2. Inclusion of students with ASD in ordinary settings

The increase in ASD prevalence within recent years has meant a parallel increase in the number of children and young students with ASD educated in mainstream pre-schools, primary schools, high schools and universities^{[6][7]}. There is a high probability that pre- and in-service teachers will find students with ASD in their classrooms. For that reason, it is important that teachers' training includes competencies in working with and teaching children and young students with ASD^{[8][9]}. Indeed, some studies point out that this training is a necessity for all mainstream school professionals^[7].

The inclusion of individuals with ASD in the same educational environment with typically developing children promotes positive outcomes in terms of social and cognitive development^[6]. In fact, policymakers of many educational systems have followed these recommendations offering schooling options in regular classes where there are available services according to the needs of a child with ASD ^{[6][10]}.

However, although there are many benefits in inclusive education, such as accessibility to general education curricula and opportunities for interactions, this situation may cause multiple challenges for students with ASD and their teachers^[11]. Therefore, teachers need to be equipped with appropriate knowledge about special education and inclusive environments, so that they are more competent in teaching students with ASD^[12].

3. Teachers' knowledge of and moderators that possibly influence ASD

The fact that teachers have knowledge about ASD is beneficial in order to provide an adequate social and educational setting in which students with ASD are included. Constructive knowledge positively impacts daily practices in mainstream and special education settings^{[7][13]}. Specifically, experts note that teachers who work with students with ASD should have knowledge about etiology, specific characteristics^[14], assessment and diagnosis^{[10][15]}, individual learning differences that

present with these students, social interactions, treatments^[14], and some strategies for early inclusion in mainstream environments.

However, traditionally it was considered that the best settings for the care and education of students with any kind of special need are those where specialists are located, because they know the specific support that is needed. It is necessary to end this kind of thinking as inclusion affects all teachers and not only specialists^[16]. Given the situation, it is imperative to empower teachers and to teach them communication and social skills as well as the know how to address problematic behaviors, or to correct negative attitudes toward students with ASD among others^{[17][18]}.

In general, teachers (in every single stage of education and no matter their specialization) need some professional and scientific training on inclusive education^{[10][19][20]}. Knowledge is a relevant predictor of teachers' ability and awareness to provide inclusive learning opportunities to pupils with ASD, helping them obtain better access to the early screening and identification process^{[21][22][23]}.

In this way, some studies have focused on initial training of pre-service teachers in order to prepare them for an inclusive concept of education^{[24][25][26]}, or have analyzed if teachers are specialized in ASD or in inclusive education^{[10][19][20]}. Other studies focused on the potential relationship between experience and knowledge^[27] or whether the stage in which teachers carry out their job affects knowledge of ASD^{[10][28]}. Finally, there is also some research aimed at analyzing if any correlation exists between culture and knowledge^[29] or if the instrument used to assess knowledge matters^[20].

3.1. Teachers' knowledge of ASD and experience

Apart from providing initial knowledge of ASD, it is contended that having experience and prior contact with people diagnosed by ASD has positive implications in teachers' knowledge^[30]. For that reason, in-service teachers usually know more about ASD than pre-service ones. In South Korea, to reduce those differences, pre-service training programs to prepare special education teachers require them to finish a traineeship. A full-time practicum for one month should be completed during the last year of training, so that they can learn effective instructional methods, test their own suitability for their chosen career, deepen their knowledge and develop their concept of education. Experiences such as practicums and volunteer opportunities are important mechanisms for providing pre-service teachers with opportunities to apply their new knowledge in practical teaching situations^[27]. A study with Greek teachers showed that work experience with children with ASD improved their knowledge in managing students with ASD^[31]. Moreover, relationships between teachers and pupils were improved thanks to experience^[32].

3.2. Teachers' knowledge of ASD and specialization

Inclusive education depends on teachers' specialization and training. Specializing in ASD after graduating is a positive way to better know the disorder and hold an important advantage for students' outcomes. Even ASD training for novice in-service teachers saw an increase of their knowledge regarding the disorder^[33]. Teachers who are supportive of inclusion and have sufficient training can play a critical role in making real inclusion easier^[34]. In addition, mainstream teachers (from primary and secondary stages) assume a lack of knowledge^{[11][35][36]}, and misconceptions^{[13][37]} about educating students with special needs. They do not feel competent nor confident when teaching students with ASD^{[11][35][38]}. It is probably because of the lack of specialization^[11]. Consequently, some look for knowledge attending specific courses or may also benefit from additional training by specialist staff^[34].

3.3. Teachers' Knowledge of ASD and stages

Knowledge is also linked to the relevant stage that the teachers are working within. It is beneficial for teachers to have good or adequate knowledge about ASD for improving the educative experience through adaptive settings, time management assistance, and to help identify potential stressors. In this regard, primary school settings are more prepared than secondary high school settings to include students with ASD^{[10][39]}. Teachers at the primary stage seem to have a higher knowledge level regarding ASD. However, post-primary school teachers' knowledge is poor. Some research has outlined that transitions are crucial moments to strengthen inclusion. In fact, the transition from primary to secondary education is a major shift supposing considerable social, emotional, academic, and organizational challenges^[28]. For that reason, teachers must be educated in order to help students with ASD^[11]. Regarding the university stage, the number of university students with autism is increasing, and it is crucial that these students can access adequate support ^{[40][41]}. However, a survey revealed that campus members, including faculty professors, had limited knowledge about ASD^[42].

3.4. Teachers' knowledge of ASD and culture

Teachers' knowledge is correlated with the culture and country where the assessment is carried out. Some research has found differences in teachers' knowledge about ASD across countries, especially because of differences in access to training and consequently a lack of knowledge. A study comparing self-efficacy, stress, social support, coping and burnout from teachers in France and Quebec working with students with ASD^[29] pointed out the differences existing between the two countries regarding training, experience, educational requirements, and knowledge.

While in France it is required that teachers have a specific one-year course to work with children with special needs, only around 10% of primary and secondary school teachers in Hong Kong (China) completed special education training in the last decade^[12]. In addition, knowledge of ASD in Ethiopia is relatively low across education and social professionals because they still subordinate matters like health to traditional customs and beliefs (responding with spiritual, cosmological, ecological, or social factors, for example)^[43]. Another investigation^[14] assessing Malaysian teachers' knowledge reported lack of knowledge to support students with ASD in the mainstream schools. There is a need to consider education systems and the cultural environment when studying the knowledge of teachers regarding ASD^{[14][29][43]}.

3.5. Teachers' knowledge of ASD and methods and instruments used for assessment

Methods and instruments used in order to measure teachers' knowledge regarding ASD are quite important. Identifying reliable assessment methods to quantify knowledge of ASD is a crucial step toward increasing global ASD knowledge^[20]. According to a review of this topic^[20], the most commonly used measures for assessing knowledge were the Autism Knowledge Survey (AKS)^[44], the Knowledge about Childhood Autism among Health Workers (KCAHW) Questionnaire^[45], the Autism Knowledge Questionnaire (AKQ)^[30] and the Autism Inclusion Questionnaire (AIQ)^[36]. Moreover, most of the articles they reviewed utilized quantitative instruments (responses to vignettes, checklists, multiple choice, true/false or yes/no, and Likert scale response options), while only 3 out of 44 articles applied interview protocols, short answers, or responses to questions about a vignette. Therefore, they did not gather significant qualitative data regarding teachers' knowledge and instruments and methods used for assessment.

4. What does the research tell us about teachers' knowledge of ASD?

Table 1 summarizes the results of 15 studies published between 2015 and 2020 that analyze the in-service teachers knowledge of ASD.

Table 1. Studies included in the review of in-service teachers' knowledge regarding ASD*.

Study	Objective	Sample	Instrument	Results and conclusions
^[46] Tanzania	To explore teachers' knowledge of teaching children with ASD.	n=16 (PST); G=14 females and 2 males; Age: ranged between 27 to 55 years; EXP= not specified; TR= not specified.	16 face to face interviews. The questions were grouped into four categories that assessed knowledge regarding ASD.	Majority of PST were less knowledgeable about ASD and its associated features. In the beginning of the research, teachers did not understand the meaning of ASD (62.5%).
^[47] South Africa	To improve knowledge of ASD conducting a school-based awareness study focusing on what educators know about ASD.	n= 50 (educators); G= not specified; Age: 46.3; EXP= 19.29; TR= one educator in each of the 5 primary school selected has regular training on disorders.	Translated to isiZulu KCAHW questionnaire ^[45] .	Teachers had a fair level of knowledge of ASD. The mean total score for the sample was 13.08 out of 19. Above 19.6% of teachers participating scored on the questionnaire less than 10 points; 49% scored 13 points; 23.5% scored 15 or more and 2% scored above 17.

[48]	China	To assess the knowledge that ECT possess regarding typical child development and ASD.	n= 471 (ECT); G= 467 female and 4 males; Age: <20 years (4.4%); 20-24 (21.9%); 25-29 (17.4%); 30-34 (19.1%); 35-39 (14.6%); 40-44 (12.9%); 45-49 (4.8%); >50 years (4.4 %); EXP= 16%; TR= 83%.	A questionnaire designed by the authors. It consists of 17 items with three options in the answers «true/false/don't know».	Knowledge of ASD among ECT in China is lacking. Most of the teachers (83%) were unable to provide accurate responses to half of the questionnaire items pertaining to ASD. Majority of them did not know associations or treatments to help people with ASD.
[49]	Pakistan	To assess the knowledge of PST about children with ASD and their ability to identify them.	n= 233 (PST); G= 94.9% female and 5.1% male; Age: 38.6; EXP= not specified; TR= not specified.	Self-administered questionnaire. It includes items about teachers' knowledge regarding ASD and about the identification of students with disabled children.	Knowledge regarding ASD was particularly deficient.
[50]	Pakistan	To assess knowledge regarding ASD among school teachers and evaluate factors influencing their knowledge.	n= 73 (PST); G= 90.4% females and 9.6% males; Age: 34 years; EXP= not specified; TR= 67.1 %.	Self-administered questionnaire, based on validated scales used in [51][52].	Wide gaps were identified in teachers' knowledge about ASD. Experience and contact with children with ASD are the only factors which influenced their knowledge.
[53]	Malaysia	To provide a preliminary study about the current teachers' knowledge of ASD among PST.	n= 120 (PST); G= 94 female and 26 males; Age: not specified; EXP= 52.5%; TR= 17.5%.	Adaptation of [48] in China and [54] in Singapore questionnaires. The final version used in the study was adapted for a Malaysian cultural context. It consists of 17 "true/false/know" items.	There is certain lack of knowledge of ASD among teachers. Although 75.7% stated they had heard about ASD, not all really knew the characteristics of ASD (70% can report the specific characteristics of ASD), and some of them still confused ASD with other diagnoses.

[55] UK	To understand Nigerian teachers' level of knowledge about ASD.	n= 177 (PST); G= 151 females and 26 males; Age: 21-30 (8); 31-40 (51); 41-50 (65); older than 51 (53); EXP= not specified; TR= not specified.	Adapted version of KCAHW questionnaire [45]. The authors of the current study suggest that a score of 0-6 indicates a low knowledge of ASD; a score of 7-12 indicates a moderate knowledge; and a score of 13 and above indicates accurate knowledge of ASD.	The total mean score on the Adapted KCAHW questionnaire was 10.81 out of 16. Teachers demonstrated a generally accurate knowledge of ASD. Only 27 (in total 15% of participants). teachers answered all questions correctly.
[56] Pakistan	To assess and compare the knowledge about ASD among mainstream and SET teachers.	n=163 (64 from special schools); G= 155 females and 8 males; Age: 35.04; EXP= not specified; TR= 77.9% (127).	The questionnaire is based on previous literature[22]. Knowledge about ASD is assessing. «Yes/No» questions with a «Don't Know» option included.	SET obtained a higher score than PST (20 vs 14.78 out of 31, respectively). There is low knowledge in both groups of teachers. In fact, 90.8% of teachers participating said that there is a need of ASD training.
[57] Turkey	To examine teachers' general knowledge about ASD, to explore their knowledge about evidence-based practices in ASD, and to examine their training needs in children with ASD.	N= 478 (92 ECT, 105 PST, 126 middle school, and 155 ST); G= 277 female and 201 males; Age: 37.3 years; EXP= 4.2% of participants have a relative with ASD and 15.7% have taught pupils with ASD; TR= 27.8.	Survey based on prior literature [44]. It has four sections: one to explore teachers' knowledge about causes of ASD, other to investigate teachers' general knowledge and perceptions of ASD and other to evaluate teachers' knowledge about effective practices for ASD.	Turkish teachers' knowledge and perceptions about ASD appear to be relatively poor. Although many questions to evaluate teachers' general knowledge of ASD were answered correctly by the majority of teachers who participated, raising scores as above 80%, however, there were some misconceptions about ASD and characteristics of children who have the disorder.
[58] Saudi Arabia	To assess the knowledge of school teachers regarding ASD.	n= 248 (PST); G= 155 females and 93 males; Age: 38.25; EXP= 31.9; TR= not specified.	AKQ[30]. It contains 30 items to ask about knowledge of ASD). There are three options to answer (True/false/ don't know).	PST have a weak level of knowledge about ASD (punctuation of 48.7%,). Previous contact with students with ASD affects the level of knowledge of PST. There is a need for training special teachers in identification and management of children with ASD.

		n=110 (from China and UK).		There are no significant differences of ASD knowledge between primary and secondary school teachers. Culture did not affect knowledge of ASD, but experience seems to be relevant: UK teachers had more knowledge of ASD than the China ones (the scores were 13.75 vs 10.47). Experience impacts knowledge of ASD: teachers who had prior contact with children with ASD showed higher levels of knowledge regarding the disorder (14.12 vs 9.78).
[59]	To investigate whether general teaching experience and culture influence and impact on teachers' knowledge of ASD.	China (n=59; 55.9% PST and 44.1% ST); G= 53 females and 6 males; Age= 32.24; EXP= 28%; TR= 38.4% UK (n=51; 74.6% PST and 25.4% ST); G= 46 females and 5 males; Age= 38.1 years; EXP= 80.5%; TR= 62.8%.	AKQ [30].	
[60]	To assess knowledge of ASD among Icelandic PST.	n= 863 (PST, 12.2% of them are special education teachers); G= 89.5% female and 10.5% male; Age= 33.9% ≤ 40; 67.5% ≤ 50; EXP= 84.1%; TR=53.8%.	Questionnaire created especially for the study by the authors. It contains 41 items rated as agree/disagree.	Teachers' knowledge is fairly good. Special education teachers obtained higher scores than PST (15.25 vs 13.98). There are significant differences between the correct answers of teachers with or without experience in teaching children with ASD (14.27 vs 13.42); and between teachers with or without additional training related to ASD (14.66 vs 13.54); ($p < .01$ in all comparisons).
[61]	To assess the knowledge toward including children with ASD in their regular classrooms.	n= 79 (PST and special education teachers from 2 schools); G= not specified; Age=29.2; EXP= 48.1%; TR= 41.8%.	A questionnaire consisting in 15 items (converted into a percentage out of 100). It is an adaptation of [44]. «True-false-don't know» response options.	Most of participants (82.3%) have a low level of knowledge about ASD. Only 2.5% of participants have good knowledge level. Experience is the only demographic background with effect on teachers' knowledge of ASD. Participants revealed the lack of opportunity to attend training programs to increase their professional development and awareness in ASD.

[62]	Malaysia	To identify the factors which are related to special education teachers' knowledge of ASD	n= 87 (special education teachers); G= 69% females and 31% males; Age: < 24 years (5.7%); 25-34; (58.6%); 35-44 (29.9%); 45-54 (4.6%); > 55 (1.1%); EXP= not specified; TR= 47.1%	An adaptation of [63] survey assessing knowledge on ASD.	Most of the special education teachers participating could identify more than five facts correctly (80,4%). Moreover, the majority of participants could identify major ASD features associated with social communication deficits and atypical play and behavioral patterns.
[64]	China	To investigate primary school teachers' knowledge of ASD	n= 386 (PST); G= 78.6% females and 21.4% males; Age: <30 (141); 30-39 (82);40-49 (102); >49 (51); EXP=42.4%; TR= not specified	Autism Stigma and Knowledge Questionnaire (ASK-Q[65]). It contains 49 questions covering 4 areas: diagnosis, etiology, treatment and stigma	The average score for knowledge of ASD in this study was 53.9%. Better teachers' ASD knowledge correlates with more positive attitude toward student with ASD.

*ECT=Early Childhood Teachers; PST= Primary School Teachers; ST= Secondary Teachers; CE: college educators (professors and mentor teachers); SET: special education teachers; G= gender; TR= training in ASD; EXP= experience with children with ASD.

Table 2 summarizes the results of 10 studies also published between 2015 and 2020 that analyze the pre-service teachers knowledge of ASD.

Table 2. Studies included in the review of comparing different teachers' knowledge groups regarding ASD*.

Study	Objective	Sample	Instrument	Results and conclusions
Pre-service teachers				
[66] Jordan	To investigate levels of knowledge among pre-service SET.	n= 56 (pre-service SET: sophomore (9), junior (24) and senior (23) grade); G= 40 (71.4%) females and 16 (28.6%) males; Age: not specified; EXP= not specified; TR= during this research a training program was conducted.	The authors developed a 40-item test which covers the basic domains of the training program. There were multiple-choice and "true or false" questions.	The participants' scores compared to their results of the pretest (16.66/40 means low level of knowledge) were significantly better ($p < .001$) in the posttest (21.91/40 means moderate level of knowledge). There were no statistical differences between the participants at different year level.

Spain	[67]	To examine pre-service teachers' knowledge, gaps and misconceptions about ASD and to compare them between first and last year pre-service teacher students.	n= 866 (pre-service teachers: 435 in their first year at university; 431, in their last year. Seventy-five of them were pre-service SET); G= 726 females and 140 males; Age: 20.13 (1 st) and 23.45 (4 th); EXP= 23.2% (1 st) and 23.7% (4 th); TR= 0.7% (1 st) and 1.4% (4 th).	Adaptation of AKQ ^[30] .	Fourth-year students had higher levels of knowledge and fewer gaps than the first-year students, although they also had more misconceptions ($p < .001$). Pre-service SET obtained more knowledge ($p < .001$) and fewer misconceptions ($p = .003$) than pre-service PST. Training and experience had influence on their knowledge, misconceptions and gaps.

UK	[68]	To offer a baseline assessment of knowledge of ASD on trainee teachers.	n= 326 (pre-service mainstream teachers); G= 85% females and 15% males; Age: 18-20 years old; EXP= 69%; TR= not specified.	AKS ^[44] . It is a Likert-style questionnaire.	The mean score of AKS was 38. Levels of knowledge were comparatively high among participants, although it is evidenced the need for training to develop trainee teachers' self-efficacy and confidence in their pedagogical practice.

Studies comparing pre- and in-service teachers

Malaysia	[69]	To identify the level of knowledge of SET in educating children with ASD.	n=312 (pre-service and in-service PST or ST specialized in special education); G= 86.9% females and 13.1% males; Age: 84% were 20-40 years old; EXP= pre-service (\bar{x} =2.29) or in-service (\bar{x} =1.83); TR= pre-service (\bar{x} =2.14) and in-service (\bar{x} =1.83).	Adaptation of a questionnaire ^[70] . It contains 32 items presented under three categories: preparation in ASD, knowledge and teachers' self-reported competence in teaching children with ASD.	Participants have a good knowledge about some characteristics of ASD. However, there were high levels of misinformation regarding the characteristics of ASD among teachers. The findings of this study highlight the importance of in-service training. In total, 77.6% of participants have students with ASD but lack of experience and training.

Studies comparing different professionals** from the educational field

[71] USA	To examine variables associated with the self-efficacy for working with students with ASD (as knowledge, experience and training).	n=80 (different professionals); G= 72 females and 8 males; Age= not specified; EXP= .048 (B); TR=-.059 (B).	AKQ ^[30] .	Scores on the knowledge questionnaire were significantly higher following the training (11.28 vs 12.38; $p < .001$). It was found large correlations between prior training and knowledge about ASD (the higher level of training, the more knowledge about ASD). Knowledge, experience and training in ASD were associated with teachers' self-efficacy. Experience with students with ASD was not correlated with knowledge about ASD.
[72] USA	To explore pre-service ECT's knowledge of ASD and compare it to the perceptions of mentor teachers.	<p>n= 87 (pre-service teachers and mentor teachers).</p> <p><u>Pre-service teachers (n=81):</u></p> <p>G= 81 female; Age: not specified; EXP: 84%; TR: 100%.</p> <p><u>Mentor teachers (n=6):</u></p> <p>G= 6 female; Age: 26–32 years (33%), 33–40 years (17%), 51–60 years (33%). One participant did not provide the age; EXP: 100%; TR: 33%.</p>	AIQ, ^[36] .	<p>Percentage of correct responses to the knowledge items of pre-service teachers increased as they progressed through the program (first test, 78%; second test, 80%; and third, 83%).</p> <p>Pre-service teacher Knowledge Total Scores were lower than mentor teacher (80% vs 93%).</p>
[73] Turkey	To investigate knowledge of ASD among teacher candidates who were enrolled in preparation programs.	n= 504 (pre-service teachers: 146 ECT; 130 PST; 103 guidance and psychological counseling; 125 SET); G= 323 (64%) female and 181 (36%) males; Age: 22.61; EXP= not specified; TR= not specified.	Adaptation of ^[63] questionnaire. It includes 14 items to evaluate teacher candidates' knowledge about ASD.	Turkish pre-service teachers (including pre-service SET) have not an adequate knowledge in the area of ASD. Among the most extended misconceptions about ASD, participants thought that lack of maternal responsiveness and social issues are the main causes of ASD (10-19%).

two situations, we calculated the average among articles results. Eleven studies ^{[46][48][50][53][57][58][61][66][67][68][77]} revealed low levels of knowledge regarding ASD among their participants; nine studies^{[47][49][55][56][59][60][62][64][73]}, medium knowledge, and five studies ^{[69][71][72][74][75]}, high level of knowledge.

Table 3. General information about studies reviewed depending on level of knowledge*.

Knowledge	Studies	Country	Spezialization	Instrument
Low (30<50%)	^{[48][50][53][57][58][61][66][67][68]}	China, Pakistan, Malaysia, Turkey, Saudi Arabia (2), Jordan, Spain, UK	PST, ECT, HST, special education teachers, CE	Questionnaires
	^{[46][77]}	Tanzania, USA	PST, CE	Interviews
Medium (50<70%)	^{[47][49][55][56][59][60][62][64][73]}	South Africa, Pakistan (2), UK (2), China (2), Iceland, Malaysia, Turkey	PST, HST, special education teachers, different professionals	Questionnaires
High (70<90%)	^{[69][71][72][74][75]}	Malaysia, USA (3), Ireland	PST,ST,CE,special education teachers, different professionals	Questionnaires
*ECT=Early Childhood Teachers; PST= Primary School Teachers; ST= Secondary Teachers; CE: college educators (professors and mentor teachers); SET: special education teachers; G= gender; TR= training in ASD; EXP= experience with children with ASD				

5. Conclusions

Teachers' knowledge of ASD is generally poor. It seems that the level of knowledge depends on the stage teachers work in, prior experience and possible prior contact with students with ASD^[30]. Studies involving pre-service teachers and specialists (such as special education teachers or counselors) achieved higher levels of knowledge than those studies involving only mainstream teachers. We can conclude that there is a need for training in pre-service and in-service teachers at every single education stage in order to achieve inclusive education and sustainability objectives.

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