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EARLY-ASD

SURVEY - SPANISH REPORT

ERASMUS+ PROGRAMME : UPSKILLING PRESERVICE TEACHERS TO SUPPORT YOUNG CHILDREN WITH AUTISM SPECTRUM DISORDER THROUGH DIGITAL SOCIAL STORIES

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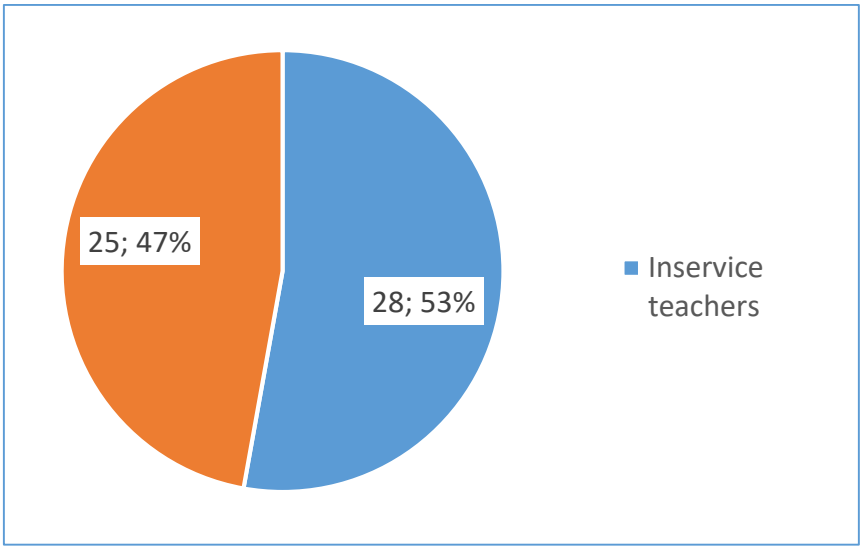
INTRODUCTION

Spain makes inclusive education one of the axes of its educational system. Within the EARLY-ASD Project, we wanted to gather some information and explore the challenges in the training of Spanish in-service and pre-service teachers in the use of assistive technologies for the socioemotional development of children with ASD. Specifically, our target groups are teachers working or preparing to work in the fields of Early Childhood Education (ECE) and Special Education (SE).

In order to address this aim, together with other colleagues who are part of the project, we co-designed a general survey. The application of the questionnaire in Spain took place in February and March 2025 via Google Forms and was launched to a convenience sample of practising teachers and future teachers in training. On the one hand, for the sample of in-service teachers, incidental sampling was used and the instrument was sent to several educational institutions in the Community of Madrid. Particularly, a total of 138 invitations to participate were sent, and only 31 valid responses were obtained, of which three were discarded from teachers who did not work with children in the age range of the study. On the other hand, the sample of pre-service teachers in training was made up of 25 students from the Faculty of Education - Teacher Training Center at the Complutense University of Madrid (Figure 1).

Figure 1. Sample composition



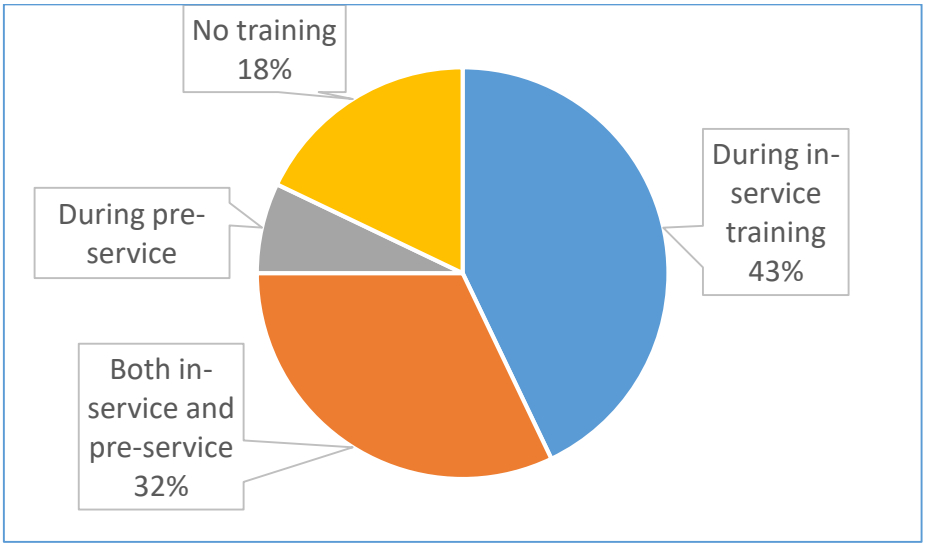
The average age of the participating in-service teachers was 42.6 years. Most of them (71.4%) work in ECE centers , 21.4% in SE centers and a minority (7.2%) in other institutions. All of them work the age range from 3 to 6 years, corresponding in Spain to the second cycle of ECE. The most usual places of work are public or private ECE schools or public and private or subsidized primary education schools, which in Spain also embrace ECE and include inclusive education classrooms and, sometimes, specific SE classrooms. One participant also works in a private early care center. A percentage of 57.1% work in regular classrooms, 32.1% in inclusive classrooms and 10.7% in SE classrooms. The average teaching experience (as both, teacher or special educator) is more than 17 years, and the average experience with students with ASD is slightly less than 9 years. The number of children with ASD who have had throughout their professional career is very variable, ranging from 1 (in one case) to more than 30 (in two cases), with an average of 10.25 children. The average number of these children with whom they are working in the current academic year is just under 2 (1.93). To interpret these data, it should be taken into account that, in the Community of Madrid, the maximum number of children with special educational needs in integration classrooms is one or two depending on the degree of disability, and in SE classrooms there can be between 3 and 10 depending on the type and degree of disability.

Regarding pre-service teachers, most of them (68%) are between 18 and 22 years old, 28% are between 22 and 27, and 4% (only one person) are over 27. The sample comprises 88% of women and 12% of men. It is worth mentioning that education in Spain is still being a feminized profession, so it is common not to find a large number of men. The highest proportion (80%) is studying for a degree in Primary Education, 12% for a double degree in ECE and Primary Education, and 8% (two students) are part of the Master's degree in Special Education program. Therefore, the majority of them are undergraduate students. In Spain, teacher training studies in ECE and Primary Education are university degrees with a generalist orientation meaning the training is very similar for all students who follow the program at the same university. Within this general training, there is the possibility of taking a small speciality (by its Spanish name "mención" or mention) that includes 24 ECTS of theoretical classes and 30 ECTS of practical internships in a school. There is a wide variety of subjects, such as music education, physical education, special education, etc. In the case of our sample, the 23 undergraduate students have taken the mention in Therapeutic Pedagogy. However, it is interesting to point out that these mentions do not exist in ECE programs.

TRAINING

A significant proportion of in-service teachers (71.4%) have indicated to have some training regarding social and emotional development of children with ASD, 42.9% have shown some training concerning behavioral therapy, and 39.3% have stated to have notions on diagnosing ASD (it should be noted that in Spain formal diagnosis is in charge of specialized professionals such as psychologists not teachers). Teachers have received training concerning ASD mainly during in-service training (42.9%), a proportion of 32.1% have had it both in-service and pre-service and 7.1% just during pre-service training. Although these data indicate the willingness of teachers to receive ongoing training in this field, it is significant to highlight that 17.9% of teachers have not received any specific training related to ASD (Figure 2).

Figure 2. Training related to ASD (in-service teachers)



In the case of the pre-service teachers, 36% have had the opportunity to gain knowledge and experience in working with children with ASD during their studies-both theoretical and practical-, 12% just theoretical, and 28% just practical. A proportion of 24% has not received any specific training in working with children with ASD. Only the two Master's students have received more than 100 hours of training in this regard. In the case of the undergraduate students, the training hours are distributed as follows: Less than 10 hours (36%), 10 to 50 hours (32%), 50 to 100 hours (24%). Therefore, a third has received very little training in this area. The following table shows a distribution of where they have acquired training related to various aspects of ASD:

Table 1. Training in aspects of ASD (pre-service teachers)

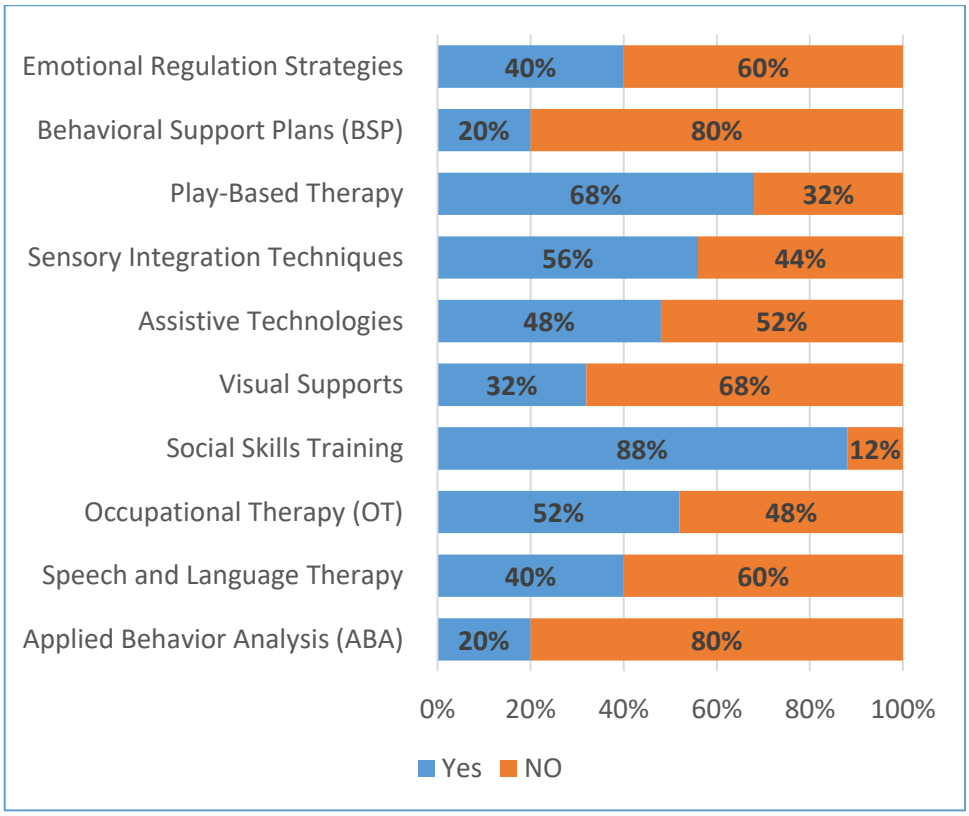
	As a part of the university studies	University studies and courses	Additional courses	No training
Participation in courses on working with children with ASD	44%	20%	4%	32%
Attendance at courses on social and emotional	32%	20%	0%	48%

development of children with ASD				
Attendance at courses on diagnosing ASD	36%	8%	0%	56%

Most of the training received has been at university, however, it is striking that there is still a significant percentage of students who have not received any type of training (neither university nor courses). Therefore, data indicates a lack of training of our students in these aspects.

Figure 3 shows the proportion of students who have learned early intervention strategies in practice or theory

Figure 3. Learning early intervention strategies in practice or theory (pre-service teachers)



The low proportions of knowledge in strategies such as Behavioral Support Plans (BSP) (20%), Applied Behavior Analysis (ABA) (20%) or Visual Supports (32%) stand out. On

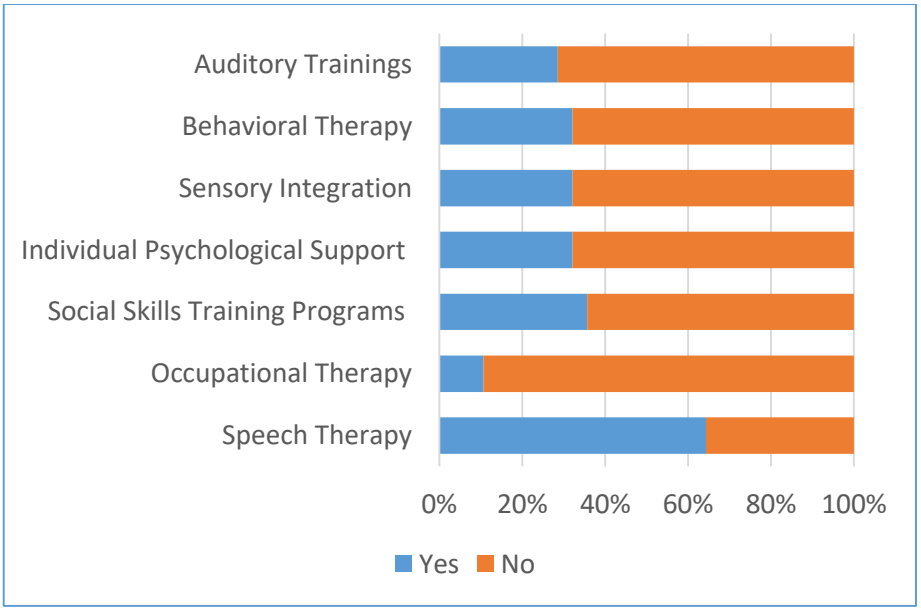
the positive side, Play-Based Therapy (68.0%) or Social Skills Training (88.0%) stand out. However, only 8% of the students state having had the opportunity to learn about strategies for developing the social and emotional skills of children with ASD, which indicates, perhaps, a certain weakness in the more practical training of future teachers.

WORKING WITH ASD / PRACTICE

The strategies used by a higher proportion of practicing in-service teachers when addressing the needs of children with ASD were, in percentage of use: Visual Supports (100.0%), Sensory Integration Techniques (92.9%), Behavioral Support Plans (BSP) (85.7%), Social Skills Training (75.0%) and Play-Based Therapy (71.4%). Speech and Language Therapy was used by 50.0%, and the following by less than half: Occupational Therapy (OT) (25.0%), Assistive Technologies (17.9%), Applied Behavior Analysis (ABA) (14.3%) and Emotional Regulation Strategies (14.3%). Other strategies, approaches and resources that they freely point out were: anticipatory strategies, visual strategies, structured teaching, pictograms, social stories, theory of mind (ToM), psychomotor therapy.

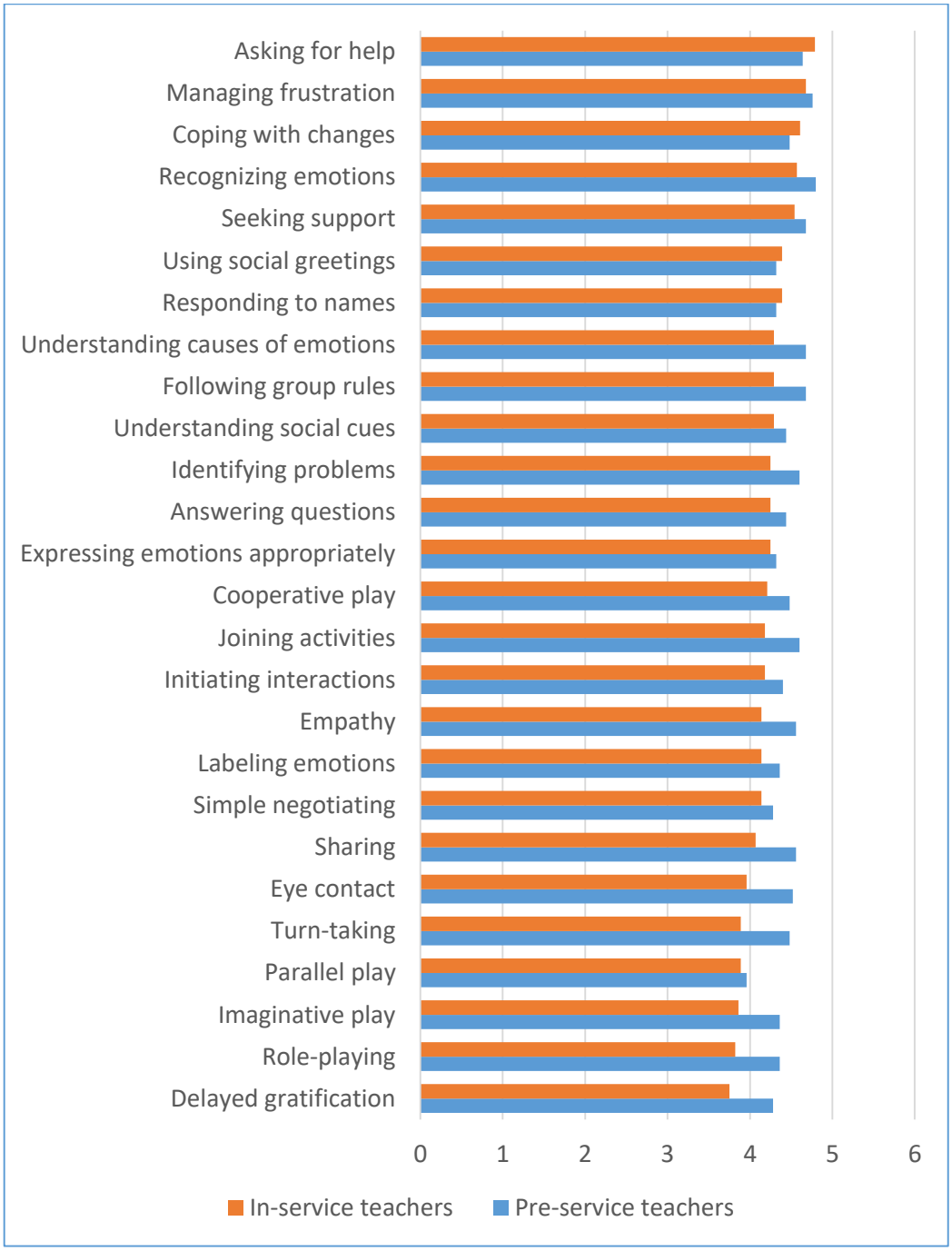
Figure 4 shows the support provided by the institution to develop their work.

Figure 4. Institutional support (in-service teachers)



Except in the case of Speech Therapy, generally provided by specialists, it is striking how little institutional support teachers find in working with children with ASD. In addition to the options offered, the following are freely emphasized: specialised professionals (educational therapy, counseling, etc.), counseling departments and ASD classrooms, all these meaning external support more than a direct help to their work.

Figure 5. Importance of certain skills in ASD therapy (in-service and pre-service teachers)*



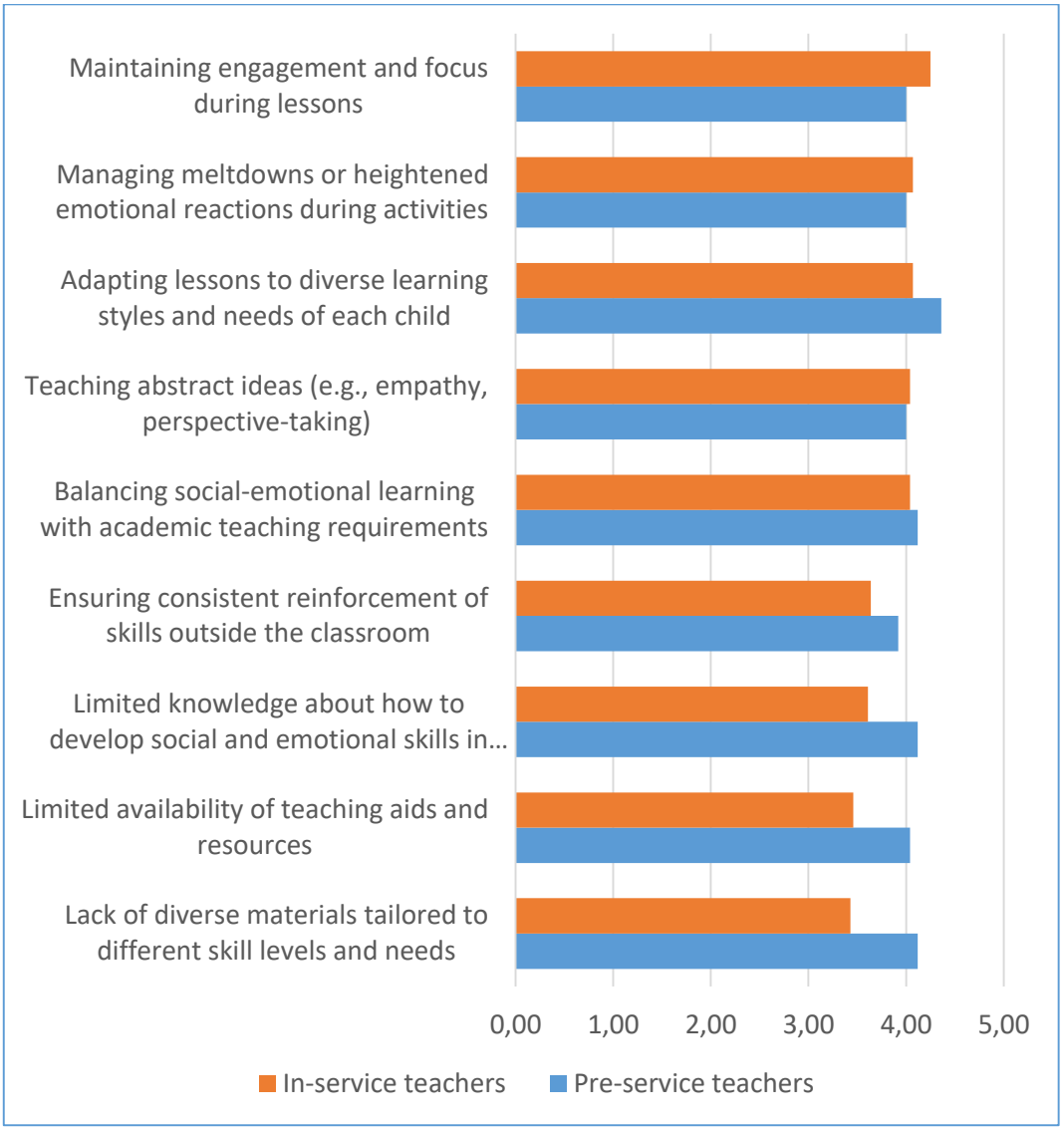
* Assessed on a 5-point Likert scale, ranging from 1 (Not important) to 5 (Extremely important).

As shown in Figure 5, in-service teachers give similar importance to the different options suggested for the skills needed to work in ASD, with ratings ranging between 3.75 and 4.79 points, on a scale of 1 to 5. The fact that "asking for help" received the highest value may imply, perhaps, a certain reactive attitude, more than a proactive one. Based on their

experience, they freely pointed out some other social and emotional skills that should have the highest priority: Emotional Regulation and Awareness, Empathy, Listening, Using Greetings, and Initiating Communication, help seeking and expressing problems, cooperative work and social integration, acceptance of changes, conflict resolution through dialogue, social codes, active participation in tasks. In the case of pre-service teachers, the scores were generally higher, ranging from 3.96 to 4.80 points. The two most valued skills are managing frustration (4.76) and recognizing emotions (4.80).

In their professional work or during their internship work, in-service and pre-service teachers found many challenges in developing social-emotional skills in children with ASD. In the former group, all the options offered move in a relatively high frequency range between 3.43 and 4.25 points (1 to 5 scale). In pre-service teachers, the range is a bit smaller, between 3.92 and 4.36 points. In this group, the most frequent challenge is adapting lessons to diverse learning styles and needs of each child (Figure 6)

Figure 6. Challenges in developing social-emotional skills in children with ASD (in-service and pre-service teachers)*



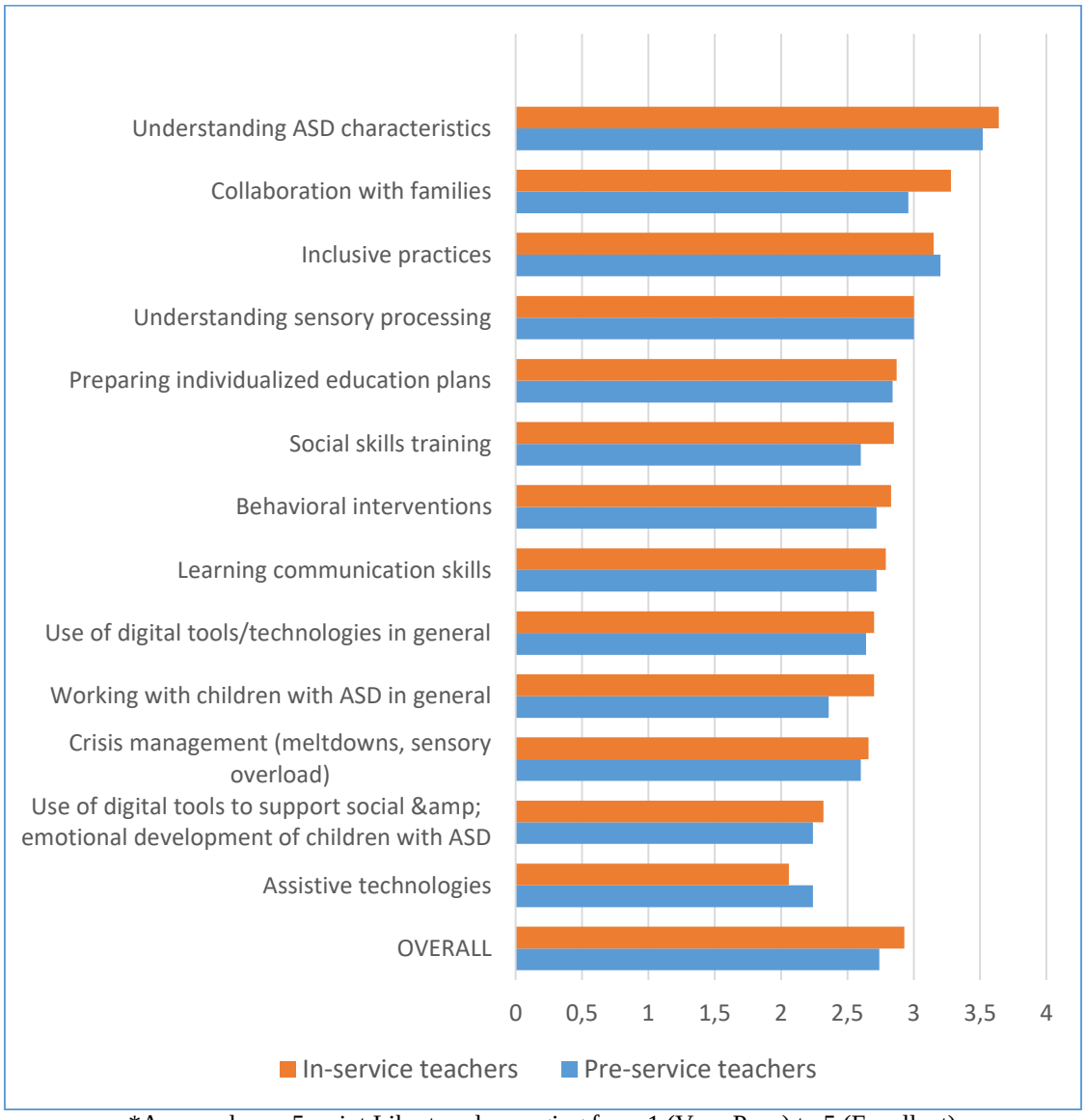
*Assessed on a 5-point Likert scale, ranging from 1 (Never) to 5 (Very often)

PARTICIPANTS PREPAREDNESS

Both in-service and pre-service teachers consider that their knowledge to work with children with ASD is rather deficient, with overall scores of 2.93 and 2.74 points (1-5 scale), respectively . In both cases, the aspect in which they consider their training to be better is the theoretical understanding of ASD characteristics, with scores of 3.64 and 3.52. For in-service teachers, the most emerging training aspect had to do with assistive technologies (2.06 points), similarly, for pre-service teachers this was the most lacking training area (2.24 points). Also, they indicate as particularly deficient the use of digital

tools to support the social and emotional development of children with ASD (2.24 points). In general, pre-service teachers see themselves as poorly prepared to work with children with ASD (2.36 points). This could make sense, given that they have not started working autonomously in the field of special education and have accumulated fewer years of experience (Figure 7).

Figure 7. Preparation to work with children with ASD (in-service and pre-service teachers)*

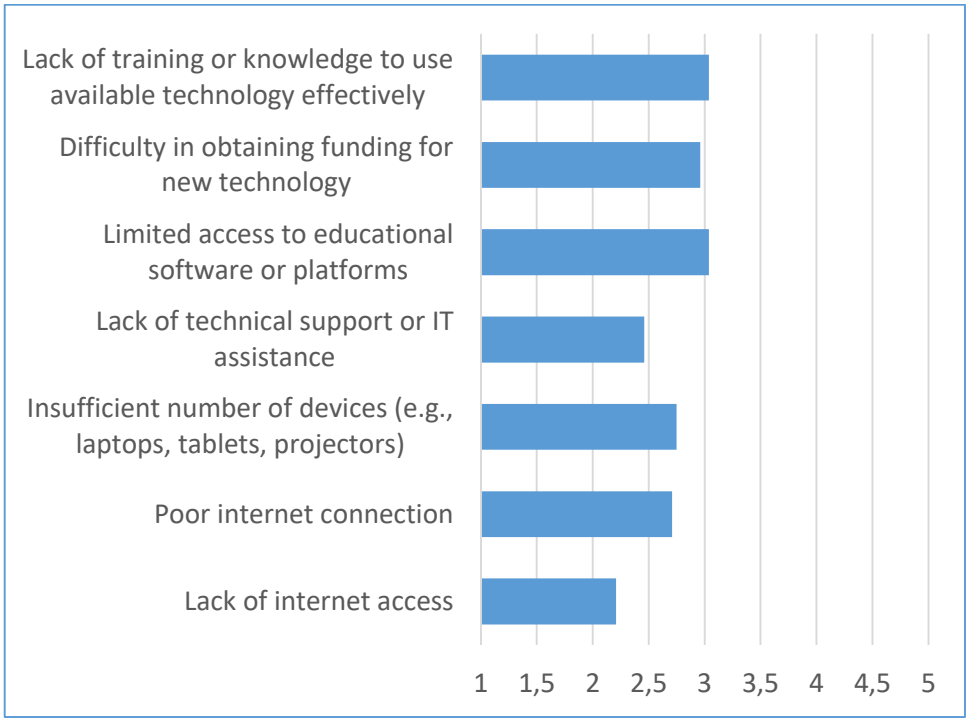


*Assessed on a 5-point Likert scale, ranging from 1 (Very Poor) to 5 (Excellent)

ASSISTIVE TECHNOLOGIES - EXPERIENCE, PRACTICE AND TRAINING

Although in-service teachers perceive themselves as more competent, it is noteworthy that 60.7% of them have not used assistive technologies assiduously in ECE with ASD. The frequency of use varies between never (57.1%), rarely (3.6%), sometimes (21.4%), often (10.7%) and always (7.1%). The assistive technologies used include digital whiteboard, iPad, tablet, digital screen, autismind app, high tech communicator, picto-translator, communicator for language stimulation, YouTube clips. No teacher feels "very uncomfortable" when implementing digital technologies and solutions in his/her work, but 10.7% "feel uncomfortable", 42.9% "neutral", 39.3% "comfortable" and 7.1% "very comfortable".

Figure 8. Challenges regarding access to technology in the workplace (in-service teachers)*



*Assessed on a 5-point Likert scale, ranging from 1 (Never) to 5 (Very often).

According to Figure 8, the most frequent challenges regarding access to technology of in-service teachers were: (1) limited access to educational software or platforms and (2) lack

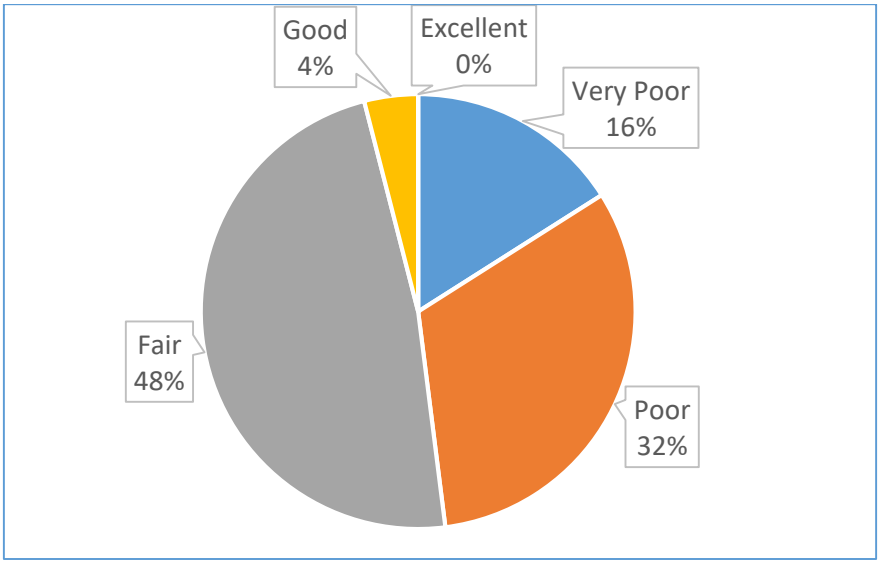
of training or knowledge to use available technology effectively, both with a score of 3.04 points. With the aim of to deepen their difficulties, this section included an open question where teachers again insisted on the lack of: training and knowledge, time to organize the session and prepare the devices and finally, they mentioned how children's screen exposure hindered in-depth work on skills and behaviors, and challenges with providing individualized attention.

On the other hand, as far as pre-service teachers are concerned, only 36% have gained knowledge about assistive technologies used in working with children with ASD. The assistive technologies they are aware of include: AACs through ICTs, alternative communicators, communicator (e.g., a tablet with a communicator), tablets, communication facilitators (augmentative systems), visual support technologies (pictograms, regulatory elements). Also, 76% have never attended courses or workshops on the use of such technologies and children with ASD, only 8% have received this training as a part of their university studies, 4% in additional courses, and 12% in both systems, studies and courses. They rated their knowledge of assistive technologies for children with ASD as moderate (40.0%), poor (40.0%) or nonexistent (20%). None of the participating students considers their knowledge in this regard to be "good" or "very good". A proportion of 60% has not had the opportunity to observe how assistive technologies are used in practice when working with children with ASD, while 40% of them have had this opportunity. Sixty-four percent do not know what technology can be used in these circumstances, although 36% do have this knowledge. Therefore, a training need is identified in this regard.

Concerning the use of it in practice, a percentage of 76.0% of pre-service teachers have never used assistive technologies when working with children with ASD, compared to 24% who have done so. For 12% of those who have used them, their use was "easy", for 16% "difficult" and for 72% neither "easy nor difficult", which reveals a possible training gap. They value rather negatively the availability of assistive technologies for children with ASD in the institutions where they have completed internships or worked. This could

be due to the existence of pressure to use technologies without adequate training to use them (Figure 9).

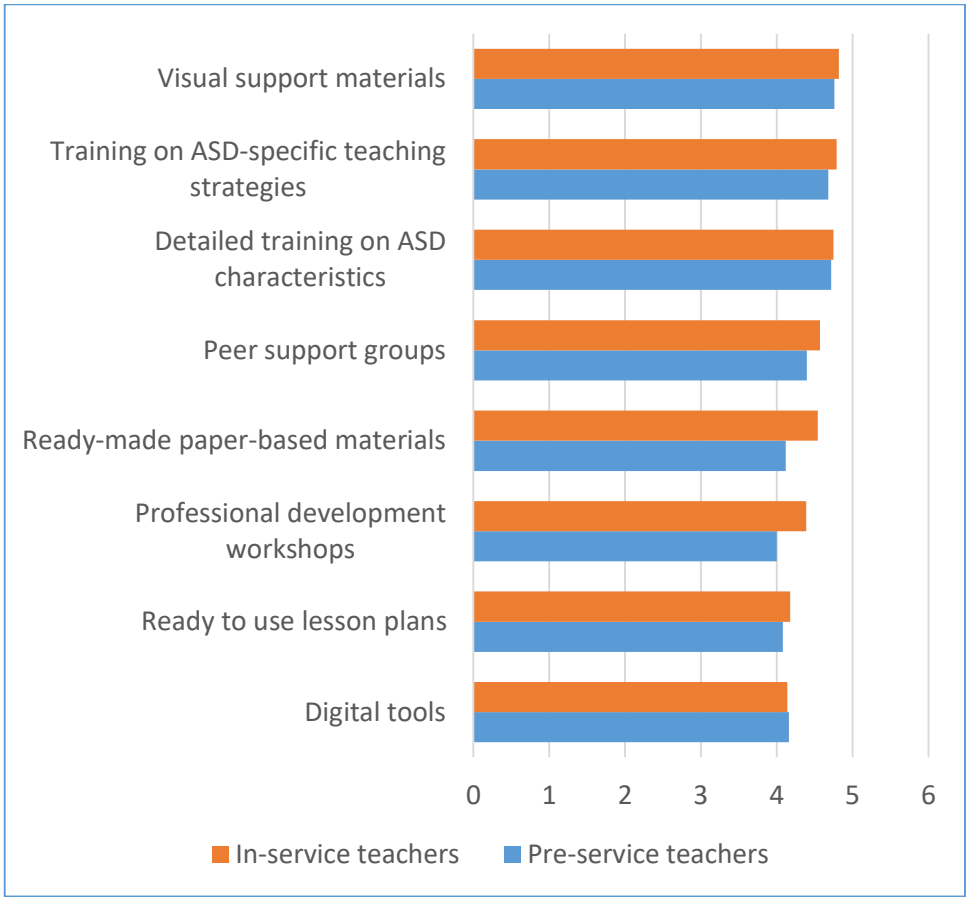
Figure 9. Availability of assistive technologies for children with ASD in the institutions (pre-servise teachers)



NEEDS

Both in-service and pre-service teachers attached great importance to the possibility of having access to a series of proposed resources or support for working with children with ASD. In both cases, the first place is occupied by the availability of visual support materials. Comparatively, access to digital tools, ready-to-use lesson plans, professional development workshops and ready-made paper-based materials is less important for both groups. These last resources are less important for pre-service than for in-service teachers, except in the case of digital tools, where the value is slightly higher for pre-service teachers (Figure 10).

Figure 10. Access to resources or supports (in-service and pre-service teachers)*.



*Assessed on a 5-point Likert scale, ranging from 1 (Not important) to 5 (Extremely important).

For both, in-service teachers and pre-service teachers, the most useful assistive technology training options to help them working with children with ASD are those that are more practical in nature: hands-on workshops, resource-based learning (guides, manuals) and on-the-job training. They are more skeptical about Higher Education courses, as well as online options: live online training and online self-paced courses. Interestingly, the ratings of these last options are lower in the younger group of pre-service teachers (Figure 11).

Figure 11. Usefulness of assisted technology ways training (in-service and pre-service teachers)*

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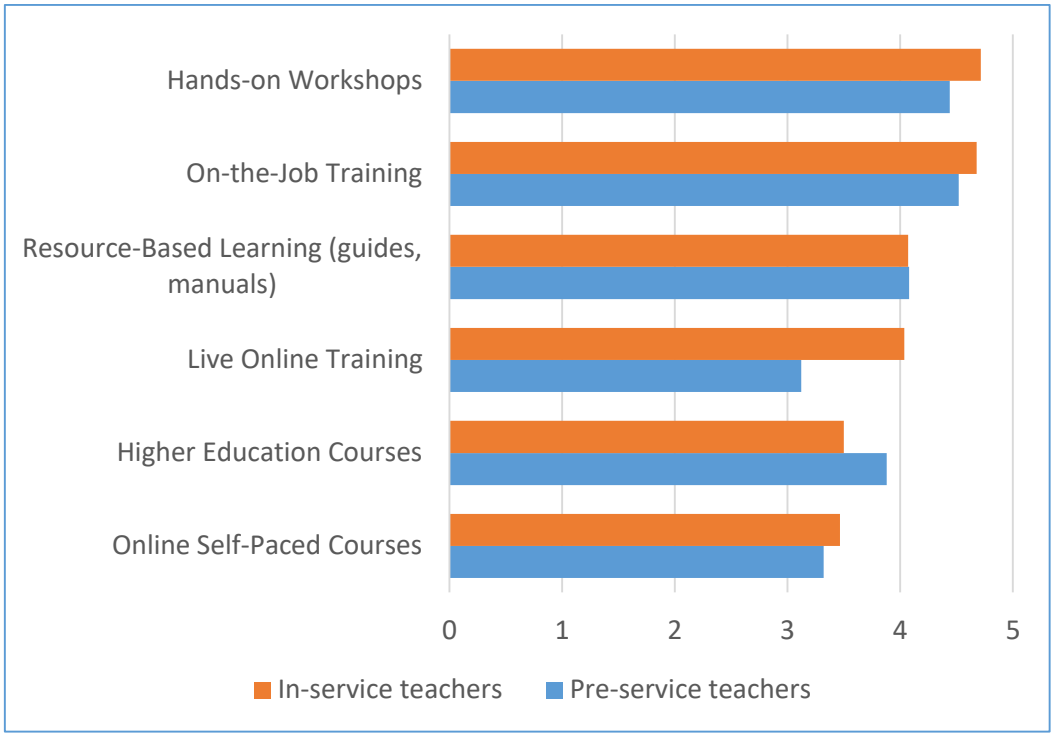


**Assessed* on a 5-point Likert scale, ranging from 1 (Not useful at all) to 5 (Extremely useful).

Some of them point out the following complementary training alternatives that could be very useful in their daily work with children with ASD .

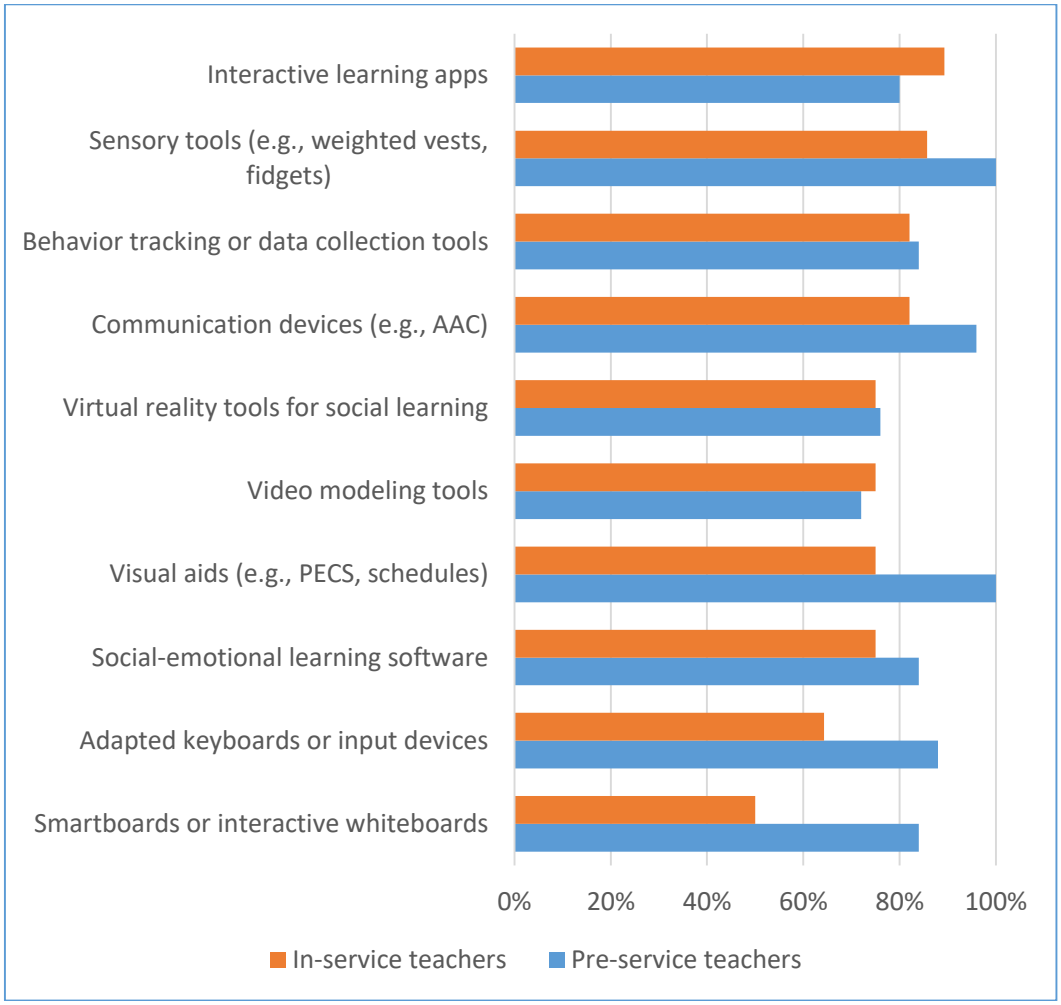
Table 2. Other training or strategies needed (in-service and pre-service teachers)

In-service teachers	Pre-service teachers
● Strategies to cope with tantrums and disruptive behaviors in the large group ● Behavioral techniques to implement in the classroom ● Crisis and emotional management ● Emotional management, executive functions and theory of mind ● Methodology and strategies ● Solve behavior problems	● Training in augmentative communication systems and bimodal language; strategies to reduce communication demands using visual supports ● Crisis and emotional management training; training on managing anger and disruptive behavior using executive functions and theory of mind ● Strategies to cope with tantrums and disruptive behaviors in large groups;

• Practical training • Applied workshops • Specific training in diagnosis and intervention • Family engagement training • Dealing with families • Parent workshops and resources • Inclusive classroom strategies • Inclusive education training • Augmentative communication systems • Classroom organization and design of robust communication boards in high technology • Training in social skills	behavioral techniques for managing violent outbursts • Practical workshops with children with ASD; applied workshops, case studies, and training on diagnosis and intervention • Designing robust communication boards and lesson plans • Family engagement training including courses and meetings; accompaniment and support for families • Inclusive classroom strategies and training on inclusive education • Specialized training on ASD characteristics and diagnosis; training in diagnosis and intervention with families • Training on integrating technology in classroom organization • Training in social skills development and direct communication • Training for independent living and transition to adult life

In-service teachers also point out some strategies to improve training for teachers during their course of study. Again, the most practical alternatives stand out: sensitization courses, courses with professional counseling, practical internships, specific ASD training courses, real practice, courses providing practical tools, specific training in AAC, training on sensory integration, support staff guiding in the classroom.

Figure 12. Assisted technologies needed (in-service and pre-service teachers)



As can be seen in Figure 12, in-service and pre-service teachers recognized the need for using a number of assisted technologies. With the exception of interactive learning apps and video modeling tools, which are more marked by pre-service than in-service teachers, in all other cases the relationship is the inverse. In the group of in-service teachers, the most indicated option is interactive learning apps, which is marked by 89.3% of the participants. One hundred percent of the pre-service teachers indicate the need for visual aids (e.g., PECS, schedules) and sensory tools (e.g., weighted vests, fidgets).

CONCLUSION

Spain strongly advocates for inclusive education, considering it one of the cornerstones of its educational system. The importance given to inclusive education contrasts with the

poor training provided to teachers to carry out this type of education. The training of primary school teachers (children aged 6-12) offers a small amount of specialization in therapeutic pedagogy or language, with very few credits. In the case of ECE teachers (children aged 3-6), there is not even that. In general, the data collected show that a significant proportion of pre-service teachers have not received specific training to work with children with ASD, even among those enrolled in therapeutic pedagogy programs. Only Master's students reported receiving more substantial preparation. This training gap is also echoed by in-service teachers, who consistently express the need for more practical, hands-on training aligned with classroom realities. A proportion of 24% of the students participating in the study have not received any specific training in working with children with ASD, despite being enrolled in therapeutic pedagogy courses, and only two Master's students have received more than 100 hours of training in this regard. The education administration is currently reviewing undergraduate curricula in collaboration with the universities.

In their comments, the in-service teachers highlight this gap, especially with regard to practical training. One of them points out: “I still need a lot of training to work with students with ASD.” Another adds: “It is taken for granted that an early childhood education teacher has to be a specialist in all areas, and sometimes we feel helpless because we do not have the technical knowledge to put it into practice”. Teachers try to fill this gap with courses during in-service training.

They also complain a lot about the conditions in which they have to work. One of them comments:

> It is very difficult to work in a classroom of 20 children where the teacher is alone with them most of the time and also has a child with ASD. Personally, I lack the tools and often feel that I cannot reach everyone, as each class has different characteristics, such as lack of attention, behavioural problems, some developmental delays, and so on. There is also a lack of support from families, who find it very difficult to accept their children's difficulties in the early years, which delays diagnosis and the support they can receive. It is very frustrating to know that you are not always able to reach these children... not knowing if what you are doing is right and if it is really helping them... The training of teachers is essential and

> they must be provided with the necessary resources, as this is becoming an increasingly common reality in schools...

Teachers emphasize their lack of tools to address the diversity of needs in their classrooms, particularly highlighting their limited training in the use of assistive technologies. In their professional work or during their internships, pre-service and in-service teachers find many challenges in developing the social-emotional skills of children with ASD. They recognise the help that digital tools and assistive technologies, such as visual support materials, can provide in this regard, but almost a third say they do not use them, recognising this as one of the key gaps in their training. They feel there is a strong need for training in screen use and working with families.

We would like conclude with the testimony of a teacher who is very eloquent in this regard:

> In general, there is a lack of material resources in schools, combined with a lack of specialised staff (therapeutic pedagogy and language). This often prevents the use of very interesting technologies and resources in the classroom. In many cases, there is a lack of teacher training and coordination between specialists, resulting in little standardisation of learning and sharing of resources. In addition, the situation in which many of these students spend their afternoons in front of screens sometimes makes it difficult to use them in schools, as there are cases in which it is totally counterproductive and generates behaviour that is contrary to what we want to achieve.

In summary, the results of this study highlight the urgent need to revise and improve both initial and ongoing teacher training regarding ASD. There is a clear need for specific training, strategies for family engagement, visual materials, and tools that enable inclusive, personalized, and effective intervention. Training should be practical, accessible, and focused on the pedagogical use of assistive technologies. Only in this way will it be possible to provide an educational response that is fair, adapted, and of high quality for the growing diversity present in today's classrooms.