

RESULTS OF THE ROUND TABLE WITH EXPERTS

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Place: Córdoba (Spain)

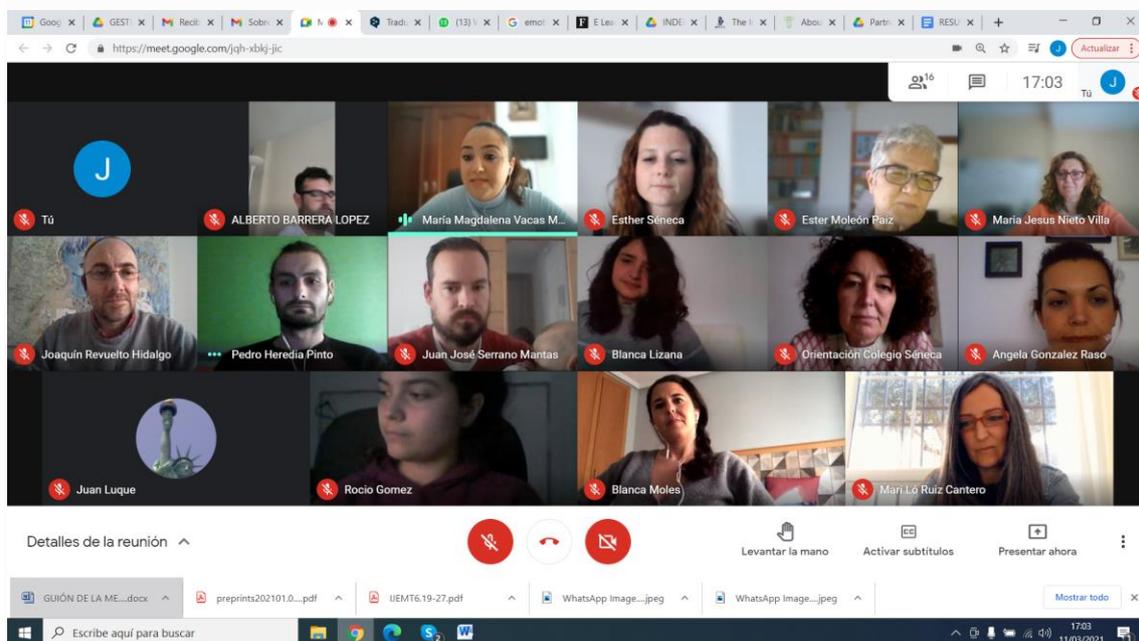
Project Partner: Colegio Séneca

Total number of participants: 16

- **Basic information about the participants.**

Due to health restrictions due to the Coronavirus, the round table was held online, with the participation of five mathematics teachers from different stages supported by the teaching and guidance staff of the Seneca School. The teachers belonged to different schools in the province of Cordoba, all belonging to ACES (Association of Teaching Centres for the Social Economy), and in addition to being specialists in mathematics they also had training in hearing and language, inclusive education and as members of the integration classroom of their different schools.

The participants in the round table were selected for their proximity to the topic, their in-depth knowledge of the subject and their experience in dealing directly with students with specific learning difficulties in mathematics.



- **Questions for discussion.**
- *How do you understand the concept of "mathematical dyscalculia" and "mathematical anxiety" and how does it differ from other types of learning difficulties (or laziness)?*

The participants indicated that dyscalculia falls under the umbrella of learning disabilities and is based on three main criteria:

- **Specificity.** It focuses only on one area, unlike other learning difficulties that do have an impact on other areas.
- **Discrepancy.** It affects students who suffer from it sufficiently to generate a lower performance than the group.
- **Exclusion. It is not included as a disability, but as a specific learning difficulty.** This has an important impact on families with children affected by dyscalculia, especially those with fewer resources, because it is exempt from receiving grants or other aid in comparison with other similar conditions.

Dyscalculia can develop from the earliest ages, offering problems in incorporating basic logical-mathematical concepts, problem solving, psychomotor aspects such as laterality or orientation, inversion of mathematical signs...

For its part, mathematical anxiety is not a learning disorder, but a lack of ability in learning mathematics generated by emotional aspects that leads to confusion and problems in the execution of tasks and operations. It causes frustration, mental blocking, demotivation and fear of failure, and tends to occur at later stages.

The group agreed that while dyscalculia is more identifiable as a learning disorder, anxiety is somewhat more difficult to detect, although at one time or another most students have shown symptoms of blocking, frustration or lack of motivation, although it does not affect everyone in the same way.

- *Briefly define the difference between 'mathematical dyscalculia' and 'mathematical anxiety'.*

The members of the round table pointed out that **dyscalculia** is included in the tests for learning difficulties as a "mathematical calculation disorder" and can be determined in a psycho-pedagogical report. One of the drawbacks in its detection is that as it does not affect only a specific area and can be revealed in the infant stage with problems of laterality, spatial domain... It also affects procedures (application in operations...), reasoning (failure in the results...) and mechanical memory.

It is a disorder that can be observed from the earliest stages, and for which the affected pupil can be provided with tools or external help to improve his or her performance by minimising the effects of the difficulty.

For its part, **anxiety** is an emotional effect that causes mental blocking, mistrust, discomfort with the subject, fear, annulment or overwhelm that leads students to make mistakes and have problems with mathematics even if they do not show any learning difficulties and are even brilliant students... It can appear at any stage and can increase, although it can also be tackled in many areas to reduce or even eliminate it.

In this sense, the participants pointed out that one of the keys may lie in the fact that the very nature of mathematics offers distinctive elements compared to other subjects:

- On the one hand, in mathematics there is only one correct answer, and it is unknown. This generates an initial bewilderment which, if you don't get the right answer, can provoke anxiety.
- It is such an exact science that when an error is made, blockages arise and this leads to nervousness.
- The very essence of mathematics is different from that of other subjects that can be learnt by studying, memorising, making diagrams... It is easier to know whether a student has assimilated the concepts or not. In mathematics there is little memory, few formulas, and what is fundamental in mathematics is understanding and practising. The paradox is that in class most students understand the concept and think they know it. Now the second part is missing, which is practice.
- In mathematics you are never certain that you know something. You have the technique, but not the answer to the problems.
- There is a mythology of mathematics, a legend that it is very difficult. On many occasions, it generates a very negative pre-approach, as if I am defeated beforehand, that it is impossible, that it is very difficult and that it is even better not to try because I am going to fail.

- *How is it found that a pupil / student has mathematical dyscalculia/ anxiety? By whom it is determined? How is it done? Is this done at all?*

The signs of dyscalculia appear in the body schema, in the first writings (mirror writing, rotations...), in writing from back to front... Also in Physical Education, when pupils show difficulties at a motor or perceptive level of orientation in space, in ball games...

In this sense, pupils are becoming more and more comfortable and work less and less on psychomotor skills, with less autonomy in their daily lives. In many cases it is non-existent, because they play less and less, they live less and less in the street... We have to replace everything that used to be worked on outdoors in a very fluid way by doing it at home or in the classroom. This means that even the pupils arrive at secondary school with the same tracks that could be followed in the previous stages, and that is what we could detect.

If difficulties persist, a psycho-pedagogical assessment is carried out, with tests such as the TEDI-MATH (up to the age of eight) and the TEMA 3 (from 8 to 11). In secondary education, there are no specific tests to detect dyscalculia.

The process for determining whether a pupil has dyscalculia is as follows:

1. The first screening is carried out by the **tutor or the mathematics teacher** who is more accustomed to working with students in this area.
2. The ordinary measures of individualised attention and monitoring are prior to communication with **the Guidance Department**.
3. The Guidance Department carries out **a psycho-pedagogical assessment to determine whether the pupil has dyscalculia**. This has an impact on the monitoring of the instructions on the protocol for identifying pupils with special educational needs.
4. Following this protocol, the steps to detect and identify this difficulty are followed, and subsequently a **meeting is held with the teaching team and the families** to check whether they have also observed this difficulty.
5. Finally, a meeting is held with the **paediatrician** to rule out any other type of disorder that may affect learning.

With regard to anxiety, one of the participants emphasised the human touch, personal contact and communication as the key "when I see a student who is working, but who is overwhelmed, blocked... Then I stop and stop and have conversations outside the classroom, those five minutes in the corridor to see what is happening, how he studies, why he doesn't pass, what he doesn't understand...".

- *Do you think teachers are sufficiently prepared to work with students with dyscalculia/anxiety?*

The participants agreed on the feeling that "teachers should have a much more specific training in attention to diversity", pointing out the shortcomings of university training and the almost total absence of specific preparation in these learning difficulties beyond some notions in autism or Down's. This causes a lack of strategies

and resources to work with students suffering from "not only dyscalculia, but other learning disorders". This leads to a lack of strategies and resources to work with students suffering from "not only dyscalculia, but other learning disorders".

There was a general regret among the participants, because "we still have a long way to go for teachers to have more training in attention to diversity, something that should be basic". Because without this prior training "the only thing left is the good will of the professional, who wants to train individually, to ask the Guidance Department or to rely on their own years of experience". "We are not trained, but we are willing", said one of the participants, "because although we don't have that specific training and we are not taught, we do put all the means to help the students".

- *What methodological support is available to them now? Do they have any additional resources/ support?*

In terms of didactic and methodological resources, the participants pointed out:

- Development of a bank of resources generated by the teachers of the centres themselves to provide recurrent materials as they detect difficulties in the students.
- At an evaluative level, splitting exams into parts and adapting the time taken to complete activities.
- Manipulative material. And more specifically, working with fingers as ordinary tools.
- Project work.
- Collaborative learning, which makes pupils feel more motivated and involved than listening to a standard theoretical class.
- Educational reinforcement for students with difficulties.
- Teacher support for more individualised treatment.

In reference to collaborative work among the pupils themselves, the participants pointed out that in the last year, due to health restrictions due to Covid 19 and the safety distance, they have been very limited in this respect. In this method of working, students work together, collaborate, help each other, explain to each other, and this was a fundamental resource that is now being sorely missed, especially in the subject of mathematics. "It's funny, because you can explain it three times in three different ways and they don't understand it, but a colleague explains it to them and they get it the first time, because they get where we don't", said one of the members of the round table.

In reference to professional support, whether inside or outside the school, the participants pointed out:

- The assignment of PT (Therapeutic Pedagogy Teacher) in case of curricular disadvantage or Significant Curricular Adaptation.
 - Cognitive stimulation programmes: Speech therapy...
 - PRANA (Unacquired Learning Recovery Plan) and PMAR (Learning and Performance Improvement Programme).
- *How do you think what help should be given to a child with mathematical dyscalculia/anxiety? Who should provide it?*

Support should be adapted to the needs of the learner and the possibilities of the school. The way of presenting the contents or explaining the concepts must be adapted so that they receive the information in the correct way so that they are motivated. We have physical and technological resources that we can use to find the best way for them to assimilate the information.

Contact with the family is also key to find out what the pupil likes and what motivates him/her, so that we can adapt the resources to each specific case. The help of the teacher or tutor in communicating with the family is essential, because often the difficulty is detected in this close environment. The family detects that "something is wrong" and from there they seek external support.

In terms of anxiety, the need for:

- Emotional support.
- Promotion of self-esteem.
- Importance of listening to the students.
- Proximity in tutorial follow-up work.
- Support for and with families
- To influence the pupil's sense of belonging to the group, so that they feel that they participate and belong to the group so that they do not fall behind and make progress in their learning.
- Look for success stories in other classmates to model their strategies.

Once again, one of the participants pointed out that "maths is not difficult, but it has a stigma" which means that from the earliest stages a drama is generated if a pupil fails, and immediately leads to anxiety about seeking support, private classes... **"Maths needs to be demystified, because a negative message is created that permeates pupils from an early age, as something dangerous and that they have to be careful with it", added our teacher, "which causes a bad relationship with the subject right from the start".**

- *What help would teachers need to work with students with dyscalculia / anxiety? Who should provide it?*

Focusing on university education, the "great deficit" was indicated beyond "some basic and general notions". From there, everything depends on the particular interest of each teacher, "to look for ways out and strategies based on our experience, inventing resources to remedy difficulties that we see and to which we are not able to give a name and surname".

In this sense, there was a common complaint about training "lacking in resources to help students with learning difficulties and disorders that occur throughout society". The lack of training plans from local, regional and national public and educational authorities, as well as the lack of adjustment of curricula to the reality of these difficulties means that everything remains "in the teachers' will to learn, as we lack the training and tools to detect them". **At this point, the opportunity provided by our project was emphasised, as "it is an option for exchanging information with other countries, seeing how they do it and analysing the tools for combating difficulties"**.

- *What support would parents need? Who should provide it?*

In response to this question, and prior to the round table, one of the participants contacted various associations of parents of pupils with difficulties, especially with dyscalculia, and these were some of the demands of the families:

- As a starting point, teachers should be trained to know what parents need, to give them the right information, to provide them with the tools they need, to give them the right information, to provide them with the right tools, to give them the right information, to give them the right tools.
- Give more importance to the procedure than to the result.
- There should be coordination between the mathematics specialists at the school and external offices.
- Emphasise that dyscalculia is not classified as a disability, but as a learning difficulty, and therefore there are few resources for low-income families who cannot afford to pay for external professional help for their children.
- Development of a parents' school to share and provide information
- On a more concrete level, let your children have a calculator in class. It is like not giving glasses to a pupil with myopia.

Analysing these demands, the participants assumed that "if we, who are teaching professionals, notice that we lack tools, imagine what it means for parents, who are faced with these difficulties without any training in this area". "A teacher has 25 pupils in his or her class, but a family has one or two children and this makes them worry

more, increasing anxiety and ultimately affecting everyone: families, pupils and teachers".

In this sense, one participant asked "to let us work calmly and to help their children to trust and listen to the teachers". In this way, there was talk of **healthy coordination**, because "we are not the bad guys in the film, but the ones in charge of communicating that your child has a difficulty. We are in the same boat, to help your child".

3. Conclusions of the round table

1. Dyscalculia can develop from the earliest ages, offering problems when incorporating basic logical-mathematical concepts, problem solving, psychomotor aspects such as laterality or orientation, inversion of mathematical signs...

It is based on three main criteria:

- Specificity.
- Discrepancy.
- Exclusion.

2. Mathematical anxiety is not a learning disorder, but a lack of ability in learning mathematics generated by emotional aspects that leads to confusion and problems in the execution of tasks and operations. It causes frustration, mental blocking, demotivation and fear of failure, and usually occurs in more advanced stages.

3. As a main difference, **dyscalculia** is listed in learning difficulties tests as a "mathematical calculation disorder" and can be determined in a psycho-pedagogical report. **Anxiety**, on the other hand, is an emotional effect that causes mental blocking, mistrust, discomfort with the subject, fear, annulment or overwhelm that leads students to make mistakes and have problems with mathematics even if they do not show any learning difficulties and are even a brilliant student.

4. Mathematics, by its very nature, has distinctive aspects over other subjects or areas:

- There is only one right answer and it is exact.
- That answer is unknown and cannot be learned in advance.
- You can never be sure that you know something, because you have to add practice to technique.

5. There is a mythology of mathematics, a legend that it is very difficult. On many occasions, it generates a very negative approach that **permeates students from an early age, as something dangerous and that they have to be careful with it, leading to a bad relationship with the subject from the very beginning.**

6. The signs of dyscalculia appear in the body schema, in the first writings (mirror writing, rotations...), in writing backwards and forwards... Also in Physical Education, when pupils show difficulties at a motor or perceptual level of orientation in space.
7. The process to determine whether a pupil has dyscalculia begins with observation by the teacher or tutor; it goes through the Guidance Department and a psychopedagogical assessment to determine whether there are special educational needs. From there, communication between the teaching team and the families, including the paediatrician or external support professionals, takes place.
8. The participants agreed on the feeling that "teachers should have much more specific training in attention to diversity", pointing out the shortcomings of university training and the almost total absence of specific preparation in these learning difficulties.
9. In relation to the previous point, most of the resources, strategies or tools are designed by the teaching staff themselves on the basis of their own experience or their individual desire to investigate learning difficulties.
10. In order to combat mathematics anxiety, students require
 - Emotional support.
 - Self-esteem building
 - Feeling listened to
 - To influence their sense of belonging to the group.