

CONCLUSIONS OF ROUNDTABLE

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1. PARTICIPANTS

The roundtable was organized in March 2021, online, moderated by two representants of C.J.R.A.E. Vrancea (school counsellors), with 12 participants: 2 teachers for primary education, 2 math teachers from lower secondary education, 2 math teachers from upper secondary education, 3 school counsellors (one with specific attributions in identifying children with dyscalculia), 2 teacher trainers and one representative of school inspectorate.

Direct and relevant expertise in working with children with dyscalculia was not a criterion for selecting the participants, as we were interested in getting relevant insights from all categories of respondents and to better understand the educational perception of dyscalculia.

2. UNDERSTANDING OF DYSCALCULIA AND MATHEMATICAL ANXIETY

We should mention from the beginning that some of the participants admitted their lack of understanding of the concept “dyscalculia”, while others admitted they are somehow familiar with the word, but could not precisely mention its signification. During the further discussions, we concluded that each of them had many examples of dyscalculic children in their professional experience, but they just did not know the word. The participants concluded that dyscalculia is:

- a learning disability, it is not a matter of will or motivation, it's a matter of limited possibilities in understanding and / or learning math;
- a condition that only affects math learning, while understanding and learning other subjects is completely functional, and children can even excel in other school subjects;

- a condition that has different levels of intensity, starting from difficulties in understanding numbers or math signs and going to difficulties in understanding and solving more complex problems; still, in most of the cases, dyscalculia makes learning math more difficult, but not impossible;
- a condition that usually manifests from early childhood, that is present from kindergarten and can be observed in children's behaviour and learning.

Regarding the mathematical anxiety, the participants also admitted not to be very familiar with this expression, but, nevertheless, they could define it based on the two specific terms, considering that:

- on the one hand, mathematical anxiety can refer to the frustration and almost fear that some children feel when they face mathematical tasks, not only in school, but also in real life (counting money, time etc.)
- on the other hand, mathematical anxiety can refer to fear of assessment and evaluation in math lessons, kind of usual in schools (at lower levels of intensity, the non-pathological anxiety). Children are probably more afraid of evaluation in math lessons compared with other subjects (*our note: probably due to the fact that assessment in math and Romanian language have the biggest impact on educational path in Romanian schools, those two being evaluated at the end of lower secondary education to pass to upper secondary, and, for most pupils, to graduate upper secondary education and continue to university studies*).

The participants also mentioned that the mathematical anxiety is somehow "normal" for the dyscalculic children, as their difficulties in normal life and / or lower scores in assessments can be an important factor for shame and fear; nevertheless, the mathematical anxiety is not necessarily a sign that indicates dyscalculia, as it can be present and even intense for children without dyscalculia.

3. DYSCALCULIA VS. MATHEMATICAL ANXIETY: SPECIFIC DIFFERENCES

Dyscalculia and mathematical anxiety can be present in the same time for the same child, but not necessarily, there are dyscalculic children without anxiety and also children with mathematical anxiety without dyscalculia. Therefore, the main differences are:

- dyscalculia is a cognitive deficit while mathematical anxiety is an affective state;
- dyscalculia affects the learning potential, while mathematical anxiety more often affects the results, the assessment, not the learning itself; (our note: this statement is not completely true, as a very intense mathematical anxiety will clearly have a negative impact on learning itself);
- dyscalculia is harder to overcome (if possible), it affects the children throughout its whole educational path and probably in its adult existence, while mathematical anxiety can be minimized if correct evaluation and therapy is done, with psychological assistance if needed;
- more children have mathematical anxiety compared with dyscalculia;
- mathematical anxiety is easier observable, while dyscalculia can stay hidden longer (adults can blame lack of attention or even an attention deficit, lack of motivation etc. to explain lower skills in mathematics for some children that will eventually prove as being dyscalculic).

4. DYSCALCULIA AND MATHEMATICAL ANXIETY: IDENTIFICATION AND DIAGNOSIS

According to the vast majority of our respondents, the identification of a child with dyscalculia and / or mathematical anxiety can be done by the teachers (teacher for primary education or math teacher), through systematic observation and analysis of behaviour during tasks and results, that aspect being only partially true. Of course, any teacher could observe children's behaviour during math tasks and somehow evaluate its skills in learning math, and further use that evaluation to differentiate his teaching style, tasks, explanation etc. in case of children with math learning difficulties, but no teacher could identify a child as dyscalculic.

The vast majority of participants were not aware of the existence of any procedure of identification of dyscalculic children and specific intervention, and still this procedure exists, and one school counsellor specifically involved in applying this procedure provided the details.

The official identification of dyscalculia can only be made, in Romania, by the specialists (psychologists, school counsellors, speech therapists) from Service for School and Professional Evaluation and Guidance, present in each county in Romania.

This service can identify and assess all specific learning disabilities (such as dyscalculia, dyslexia etc.), but the official evaluation can only be done at parents' requests (teachers can only recommend this evaluation to parents, but they cannot ask for the evaluation themselves). If the child is diagnosed with dyscalculia, school needs to elaborate a personal learning plan for that child and update it each year taking into consideration the achievements and the results of the re-evaluation done each year.

In terms of mathematical anxiety, things are similar: most of participants considered that any teacher could see the signs of mathematical anxiety, but no teacher could actually assess it; the big difference is that mainstream education in Romania has no specialists (psychologists) that could assess anxiety, therefore this assessment can only be done in hospitals or private practitioners, making this process more difficult.

5. DYSCALCULIA AND MATHEMATICAL ANXIETY: TEACHERS TRAINING

Analysing the teachers' abilities in working with dyscalculic children was very hard, as our participants could not get on a common answer:

- on the one hand, most of the participants mentioned and argued for the total lack of specific training for teachers to work with dyscalculic children; of course, they mentioned that there are generic courses that train the teachers in working with children with special educational needs, there are some online resources, but that does not make teachers more prepared, as a specific training would;
- on the other hand, some participants insisted on the role of practical experience and didactic expertise that could make teachers ready to work with dyscalculic children, even without some specific training.

6. DYSCALCULIA AND MATH ANXIETY: METHODOLOGICAL SUPPORT FOR TEACHERS

There was a consensus in this matter, namely that there is a general access to information about dyscalculia and teaching dyscalculic children, but there are almost no specific courses available for interested teachers and methodological guidelines and / or good practice examples are extremely limited.

Also, the participants involved in teachers' training mentioned the limited number of specialists capable to organize and deliver such trainings or to redact a methodological guide. There are some initiatives of various NGOs, but limited to some specific schools, and also some private initiatives that most teachers cannot afford to pay, as schools cannot financially support them to attend such "mentoring" activities.

Therefore, teachers' professional development in this area of their work is based most on personal reading, on internet resources and actually working with dyscalculic children and gaining personal experience. But, still, if there is no external validation of their expertise (*our note: In Romania, teachers seldom get feed-back on their didactic activities*), teachers could not know if, maybe, other methods could improve their results even more and consider any small progress as a prove of their effectiveness, unaware of the potential bigger progress that might be accessible with other methods.

7. DYSCALCULIA AND MATHEMATICAL ANXIETY: ASSISTANCE FOR CHILDREN

Our experts agreed that the educational assistance for dyscalculic children should involve teachers, parents and other specialists as school counsellors and, if necessary, psychologists from outside the educational system.

The assistance is based on the personal learning plan that is developed by the school and clearly mentions all educational intervention strategies: adapted curricula, adapted tasks, adapted evaluation tools and standards if necessary, counselling services etc.

There is a specific legislation that clearly specifies the assistance that children with specific learning disabilities can get, and even a newer legislation regarding the assurance of equal chances for children with disabilities in national exams.

Also, even if not included in any legislation, the parental role is very important, as parents should firstly fully understand themselves what dyscalculia is (very important that teachers could and should explain that to them) and then support their children in their effort to learn as much math as they can and to overcome their mathematical anxiety.

Most of the participants mentioned that dyscalculia cannot be corrected, the learning potential of a dyscalculic child will be limited during its entire educational path and

probably its adult life, but there is a potential change in results in learning math, if the teaching procedure are adequate, if parental support is present, if counselling is effective and, if needed, psychological assistance is provided (for instance to decrease the mathematical anxiety if very intense). With adequate support, a dyscalculic child will still be dyscalculic, but its results in learning math will get better and better.

8. DYSCALCULIA AND MATHEMATICAL ANXIETY: ASSISTANCE FOR PARENTS

One very important aspect is that parents should continue at home the intervention started in school, using the same methods and techniques, therefore continuing the educational effort and enhancing the impact of teachers' strategy. For this purpose, teachers should find the necessary time to discuss with parents and provide them all necessary information, resources, worksheets, learning materials etc. so that parents could continue to work with the child at home. Also, teachers should motivate parents to get involved in this intervention and encourage them to continue through positive feed-back.

Also, the school counsellor should be actively involved in supporting the parents, perhaps more at affective level than at operational level: methods of interventions are provided by teachers, school counsellors should focus more on creating a positive attitude, on supporting the parents when lack of results is frustrating and motivation is getting lower, on giving parents the tools to better relate to their children, to enhance communication etc.

There is no specific training / courses for those parents, there are almost no resources for them, therefore the individual support from school (teachers and school counsellors) is essential.

One very interesting idea is to create support groups for parents of dyscalculic children, but this does not refer to a specific existent situation known by our participants, but just an idea that emerged from the discussion, idea that might generate a positive impact.

Our note: this kind of support groups might also work for teachers, especially for the less experienced ones that are interested in learning and developing their teaching skills.

9. CONCLUSIONS

The concept of “dyscalculia” and “mathematical anxiety” are not familiar for all teachers and educational experts, but the difficulties in learning math and assessment evaluation are well-known in the educational system.

In general, teachers and other educational experts correctly identify dyscalculia as a learning deficit that only affects math, with different levels of intensity and present from early childhood. Mathematical anxiety is perceived either as fear of mathematical operation in everyday life (e.g. counting money) or fear of assessment in math lessons.

The vast majority of participants were not aware of the existence of any procedure of identification of dyscalculic children and specific intervention, and still this procedure exists. The official identification of dyscalculia can only be made by the specialists from Service for School and Professional Evaluation and Guidance, so within the educational system, but only at parents’ requests (teachers can only recommend this evaluation to parents, but they cannot ask for the evaluation themselves). The mathematical anxiety can only be diagnosed outside the educational system, as there are no psychologists in mainstream education in Romania.

Teachers initial training does not include specific training for tackling dyscalculia, and didactic expertise does not make a teacher more prepared unless some external validation of its practice, that being absent in Romania; therefore, we tend to consider that most teachers in Romania are unprepared for teaching a dyscalculic child and, unfortunately, the only way to update their didactic skills is through individual learning.

There is a specific legislation that clearly specifies the assistance that children with specific learning disabilities can get, and even a newer legislation regarding the assurance of equal chances for children with disabilities in national exams. The assistance for dyscalculic children is based on the personal learning plan that is developed by the school, that clearly mentions all educational intervention strategies: adapted curricula, adapted tasks, adapted evaluation tools and standards if necessary, counselling services etc.

One very important aspect is that parents should continue at home the intervention started in school, using the same methods and techniques, therefore continuing the educational effort and enhancing the impact of teachers’ strategy.