RESULTS OF THE ROUND TABLE DISCUSSION WITH EXPERTS

Date: February 26, 2021
Place: Jelgava, Latvia: ZOOM https://ej.uz/Math-DaMA
Meeting ID: 969 6079 3974
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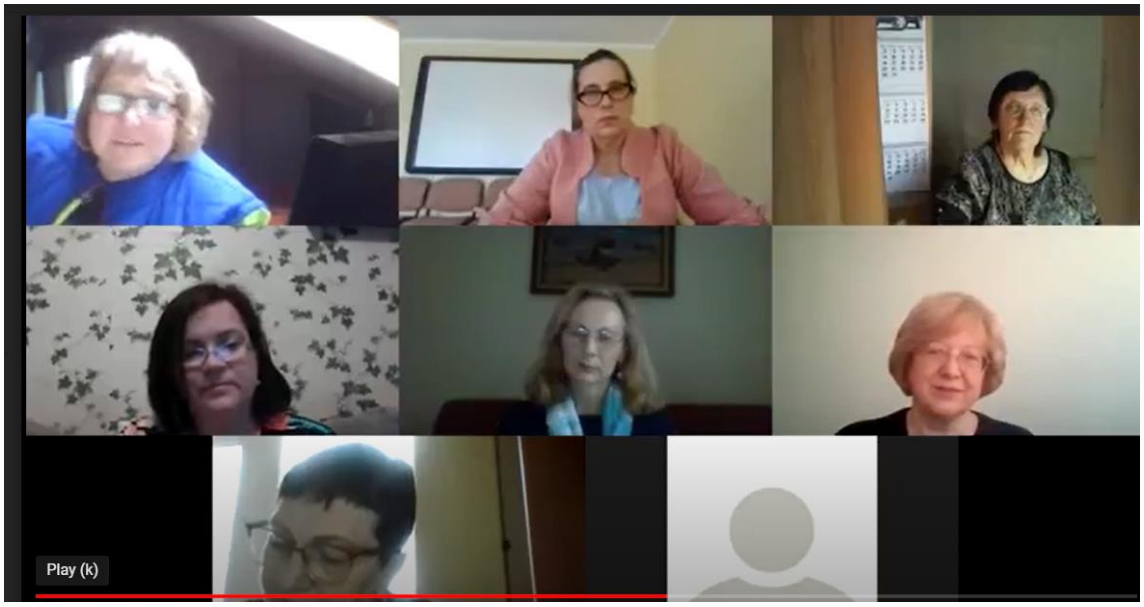
Project Partner: SIA Izglītības atbalsta birojs
Total number of participants: 8

- **Basic information about the participants.**

Due to the limitations of Covid-19, the roundtable discussion took place online with eight participants:

- **Elita Rītere**, Director of Riga Primary School named after Valdis Zālītis; Math Teacher; Vice President of the Latvian Mathematics Teachers Association;
- **Margita Jirgensone**, math teacher at Jelgava Spidola Gymnasium, head of the math methodological field at Jelgava city;
- **Diāna Zurģe**, Tukums Rainis Gymnasium, math teacher, head of Tukums, Engure and Jaunpils math methodical association, coordinator of math methodological field;
- **Anda Zeidmane**, Professor of the Department of Mathematics, Latvia University of Life Sciences and Technologies, an expert in math didactics;
- **Evija Kopeika**, math private tutor;
- Ilze Balode, Ventspils University College, associate professor, teaches mathematics at the university;
- **Sarmite Cernajeva**, RTU Engineering Secondary School math teacher, SIA Izglītības atbalsta birojs tutor;
- **Anna Vintere**, SIA Education Support Office Chairman of the Board, Education Researcher.

The participants of the round table discussion were selected on the basis of the topic, in-depth knowledge of the subject and experience of teaching math, as well as understanding of learning difficulties in mathematics and solutions resulting from selected participants' publications and reports in math teacher conferences / workshops.



<u>Questions for discussion</u>.

- ***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)?***

Mathematics learning difficulties are determined by a number of **cognitive and emotional factors**.

If a student has calculation difficulties, impaired understanding of numerical concepts and mathematical activities, difficulties in understanding and working with numerical information without words, visually and spatially, often makes calculation errors and has difficulty performing mathematical activities, then this may be a mathematics learning difficulty such as **dyscalculia**.

Dyscalculia is **not a disease**, but a **feature of the pupil's brain that determines the perception and processing of information**. However, several studies show that the mathematical performance of a student with dyscalculia is much lower than expected for age, intelligence and education.

The term "mathematical anxiety" was described as fear of math or as a **negative emotional reaction to mathematics**.

Mathematical anxiety can be caused by a number of factors: lack of appropriate mathematical knowledge, learning strategies, application of mathematics in real life, limited exam time, lack of specific materials as well as personality type, lack of confidence, and also stereotypes related to teacher and parent approaches to mathematics.

Anxiety is caused by insecurity or ignorance. If I don't give up, then I'm worried.

Anxiety is not only when solving tasks, but also before tests. An alarm is caused by a time constraint or a large number of tasks to be solved. They mix numbers when writing. Can't see the numbers written. In recent years, children cannot remember formulas. This is a psychological feature.

Pupils with mathematical anxiety are introverted. If the teacher works with them individually, then they understand, but at school they do not understand anything or cannot answer the questions.

Students are unable to comprehend the text: ability to read, take breaks, recount. This, of course, causes anxiety and affects math learning.

Students do not learn systematically, which causes problems that grow over time into anxiety.

Math anxiety is a national problem because there are large classes. If a child fails, the teacher does not notice or pay attention. This problem accumulates and affects math learning in the years to come.

Anxiety is caused by stereotypes in society. Even ministers are proud if they do not know mathematics. This attitude is passed from parents to children.

Large classes should be divided into groups. Such practice is already practiced by Jelgava Spidola Gymnasium. In smaller groups, students have the courage and opportunity to ask.

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

Dyscalculia is a **cognitive disorder**. In turn, mathematical anxiety is one of the **emotional factors** that causes learning difficulties in mathematics.

Math **anxiety can be controlled**, but **dyscalculia lasts a lifetime**. Of course, performance can improve if intensive developmental action is taken.

- ***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?***

In case of severe general learning disabilities, the Pedagogical Medical Commission decides on the degree of learning disabilities and the acquisition of a special education program.

In a regular classroom, teachers cannot do anything on their own. The teacher can only observe and advise parents to turn to this Commission and perform testing. Parents need

to understand what this would do for the child, such as longer time for tests, slower pace of learning, individualized approach, additional counseling, etc.

Parental consent is also required for a student to visit a specialist, such as a psychologist, etc. However, parents often hide that the child has learning difficulties, do not acknowledge them and do not even engage in dialogue with the teacher.

Parents are afraid to turn to the Pedagogical Medical Commission, because then the relevant index appears in the educational documents, which may affect the child's further educational opportunities.

How to determine? Dyscalculia can be considered if the following features are observed for a long time or repeatedly: use fingers to count, problems with recalling mathematical facts, difficulty linking numbers and symbols to sums or directions, understanding money, cannot determine the time after the analog clock, difficulty arranging, for example, from right to left, problems with model recognition and number sequence…

Give assignments about sweets (younger children) or money, set the time after the analog clock and if they "do not go", then the student has dyscalculia. Although, some experts argue about the importance of money or the clock in teaching math, noting that we underestimate the culture of modern life in which modern children live. Nowadays, especially the youngest children do not use money or analog clock, the object-oriented or kinetic activity (sticks, pencils, chestnuts, cats, etc.) is more desirable.

In addition, large classes (especially in large cities) and it is hard for the teacher to notice anything.

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

Knowledge is too weak for recognition, work and methodology of working. Most teachers have no understanding of dyscalculia or have not even heard of it.

Teachers are afraid of what is not an instrument of their work. They also do not have time to think about special materials or methods.

A diagnosis should be made to help. If this is done, then an appropriate method can be found and can help. Either the student is lazy and performs certain activities, becomes successful in the future, or can be tormented all the time with classic methods that do not give results.

The amount of content provided in the curriculum is large. At the moment, almost each lesson has a new theme. Therefore, the teacher focuses mainly on the transfer of content or information, and there is no time to consolidate the content, let alone the development of skills or competences. In essence, the teacher pays more attention to

the choice of methods that correspond to the content. The large number of students in the classroom - limits the possibility to individualize the approach according to the type of learning difficulties.

An extended day group is offered as a solution, where it would be possible to receive consultations or play various so-called brain games. However, in practice this is not possible because there are a large number of children (~ 40) and an individualized approach is not possible.

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

Some schools have projects, such as a teacher's assistant, which helps to understand or explain what the child has not understood. In Riga Primary School named after Valdis Zālītis teacher assistants are provided within the framework of the EU project, in Svetas basic school – financed by municipality. Small schools also have extracurricular math classes.

Various support specialists, such as a social pedagogue, psychologist or career counselor, are available in only a few schools, but in the countryside - one specialist for all schools throughout the municipality. In addition, as already mentioned, the child can receive consultations from these specialists only with parental permission.

Teaching mathematics must be seen in the context of real life. In addition, the faster students learn, the faster they forget. Currently, technology is introduced in education, but there is no calligraphy. Children do not train their memory - they do not have to learn by heart.

- ***How do you think what help should be given to a child with mathematical dyscalculia/ anxiety? Who should provide it?***

It is clear that students with dyscalculia need help to organize and process information, and in everything related to numbers and mathematical concepts or activities. Appropriate teaching methods, appropriate visual and teaching materials, practical and active participation, ICT, etc. can make it much easier for these children to learn math.

Different advices for students alreday noticed: students need more time to understand math; divide large classes into groups by levels, use an object-oriented or the object-oriented or kinetic activities, etc.

It is very important that the teacher understands the teenager. It is very important for children (especially in the younger grades) whether they like the teacher. Practice shows that 50% of success is the attitude of the teacher. The teacher's attitude also determines

the methods and materials used. There is an example of a very advanced student who copes quickly with a task and has nothing to do, but the teacher says that she will not make an effort to prepare additional tasks for her.

As the possibility is offered that the student who calculates the task faster helps others who cannot yet comprehend the idea. This means that the work must be organized in groups or teams.

Pupils have no motivation to study because there are very low requirements for completing secondary school in the final centralized exam (5%). As the example of Estonia and also Lithuania shows, the requirements need to be increased.

Additional lessons for children with dyscalculia - here both parents and the municipality need to be involved. Taking into account the results of the PISA tests and evaluating the results of the annual centralized examinations, municipalities need to take more responsibility for supporting mathematics education -

a) Consider providing, for example, teaching assistants, assistants to help students who require more time to study the subject;
b) Opportunity for counseling / extra-curricular activities outside school.

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

There is a need **to educate teachers** (and also parents) on the identification of dyscalculia. Professional development of teachers both on **teaching methods** and how to work with them.

Methodological materials are required - the repository is available to all math teachers. They should be developed and tested by a team of pedagogical professionals and practitioners. It is not possible for each teacher to develop this methodological base individually, as teachers are already overwhelmed.

At present, teachers are overburdened and their resources are limited. Additional courses or training are provided at the expense of their family or their own leisure time. therefore, teachers' work schedules should also include time for education and training.

It is noted that the education of mathematics teachers in Latvia was in a crisis situation as such, and the interest in this position is very low. In addition, the prestige of the teacher and the public attitude towards the teacher do not contribute to the motivation of teachers to seek and innovate, desire to provide an individualized approach, etc.

Learning strategies / methods / tools (including ICT) are needed that:

a) activates, motivates, inspires and excites students,
b) helps to overcome math learning difficulties,

c) and / or develop the skills needed to learn mathematics.

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

Parent education and motivation, timely recognition of learning difficulties, if they are. Various **educational seminars** for parents are needed.

Parents' organizations and **self-organized action** would also play an important role. They can help motivate parents to accept the problem, educate parents and also share their experiences, thus encouraging others. Experience stories of why it is important to notice it in time, why it is necessary, etc. Good example – parents' association "Plecs".

Currently, private teachers work mainly on the content of school curricula. However, it is desirable to work on the **development of cognitive skills in general**. The problem is that parents only pay for a "tangible" result, and they sometimes do not understand the importance of the child's overall development. although, now the situation is starting to change.

Additional Math Learning Support Units - after classes extracurricular activities (tutorials) available to the public, where the child could receive advice or help with learning, or develop creativity or the skills needed to learn math. In order to provide additional classes for children with dyscalculia, the **involvement of both parents and the municipality is required**.

Conclusions of the round table

- **Dyscalculia** is a specific ability to learn mathematics (not an inability), a feature of the pupil's brain that determines the perception and processing of information. **Mathematical anxiety** - negative emotional reaction to mathematics determed by different factors.
- Dyscalculia is a **cognitive** disorder, math anxiety – **emotional**. Math anxiety can be controlled, but dyscalculia lasts a lifetime.
- The **Pedagogical Medical Commission** decides on the degree of learning disabilities and the acquisition of a special education program in the case of **severe general** learning disabilities. In a regular classroom, the teacher can only observe and advise parents to apply to this Commission and perform testing.
- The vast majority of teachers have **no understanding** of dyscalculia or **have not even heard** of it. Knowledge is too weak for recognition, work methodology or work with such students.

- Some schools have a **teacher's assistant**, which helps to understand or explain what the child has not understood. Small schools also have **extracurricular math classes**.
- **Appropriate teaching methods, appropriate visual and teaching materials, practical and active participation, ICT**, etc. can make it much easier for these children to learn math. Students need **more time** to understand math; divide large classes into groups by levels, use an **object-oriented or the object-oriented or kinetic activities**, etc. Opportunity for **counseling / extra-curricular activities** outside school. To enable the child to develop cognitive skills in general.
- **Professional development of teachers** on the identification of dyscalculia, on teaching methods and how to work with them. Time for professional grows. *Learning strategies / methods / tools* (including ICT) are needed that:
  a) activates, motivates, inspires and excites students,
  b) helps to overcome math learning difficulties,
  c) and / or develop the skills needed to learn mathematics.
- Various **educational seminars** for parents are needed**. Additional Math Learning Support Units** - after classes extracurricular activities (tutorials) available to the public. **Parents' organizations** and **self-organized** actions to motivate parents to accept the problem, educate parents and also share their experiences, thus encouraging others.