

Levebee 

# Math Without Barriers

## 2024–2025 Report



# Executive Summary

The Math Without Barriers Project provided digital early math diagnostic assessment to over **1,100 schools** with **25,000 first grade students** across the Czech Republic and Slovakia. **97%** of participating teachers recommend Levebee to other teachers.

Addressing hidden gaps in math skills at the beginning of first grade ensures that students can effectively grasp new concepts and enjoy math from the start of their schooling. The project helped prevent early failure experiences for students, supported a more positive learning environment, and helped teachers and policymakers improve the education system.

The data collected will help national educational institutions, such as the Ministry of Education (MŠMT) and the National Pedagogical Institute (NPI), to understand children's abilities at the beginning of their formal education. This initiative has also contributed relevant data to the discussion on a smoother transition from preschool to primary education.

#### PROJECT DURATION

**September-October  
2024-2025**

#### MAIN ORGANIZER

**Levebee**

Levebee 

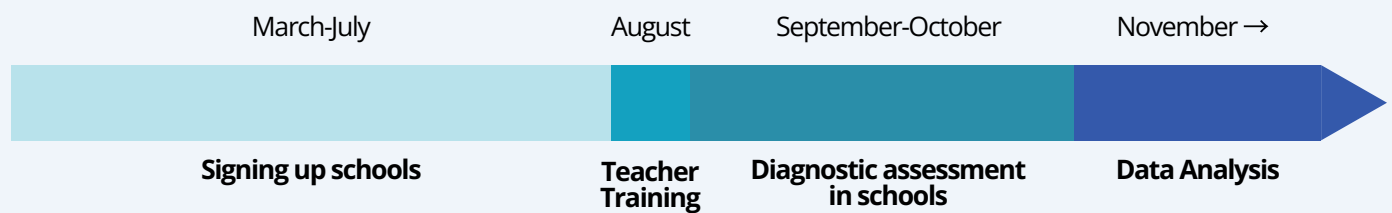


Ministerstvo  
školství, mládeže  
a tělovýchovy

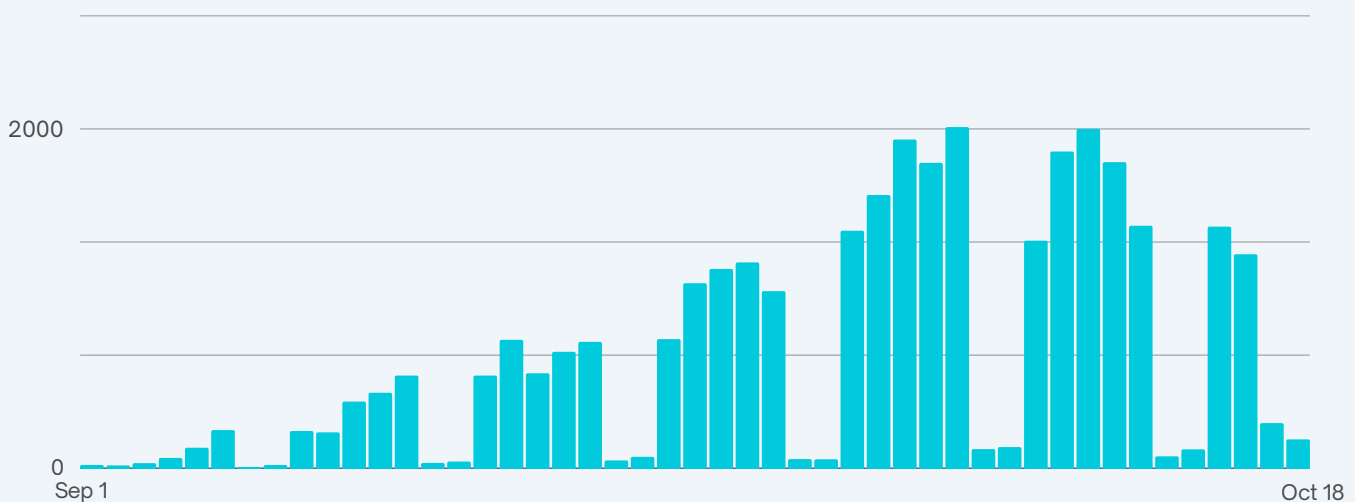
**npi**



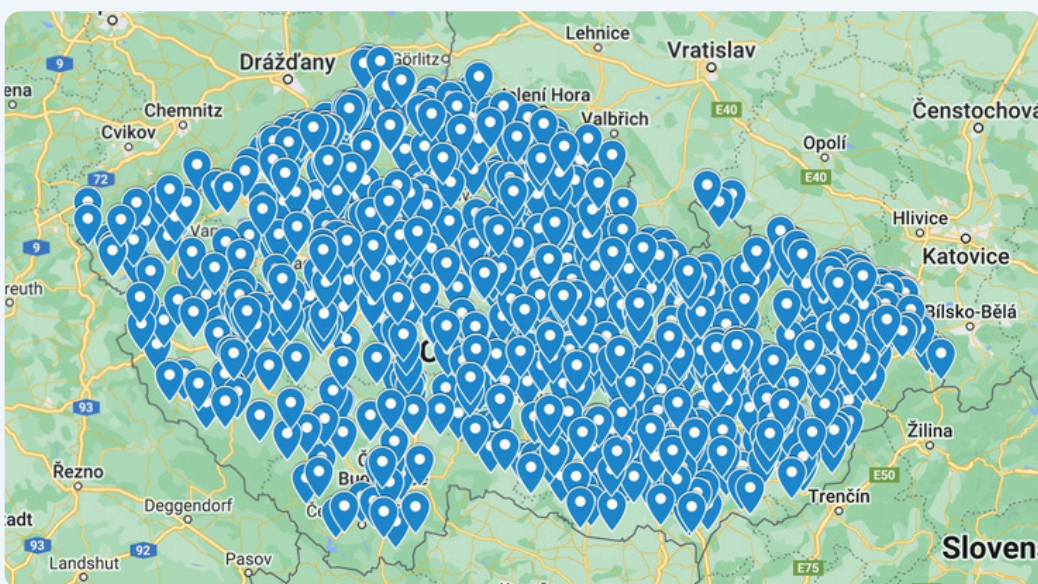
The data collection was conducted within a few weeks at the start of the school year, minimizing the difference in instructional time between schools.



Completed diagnostic assessments by day of the project

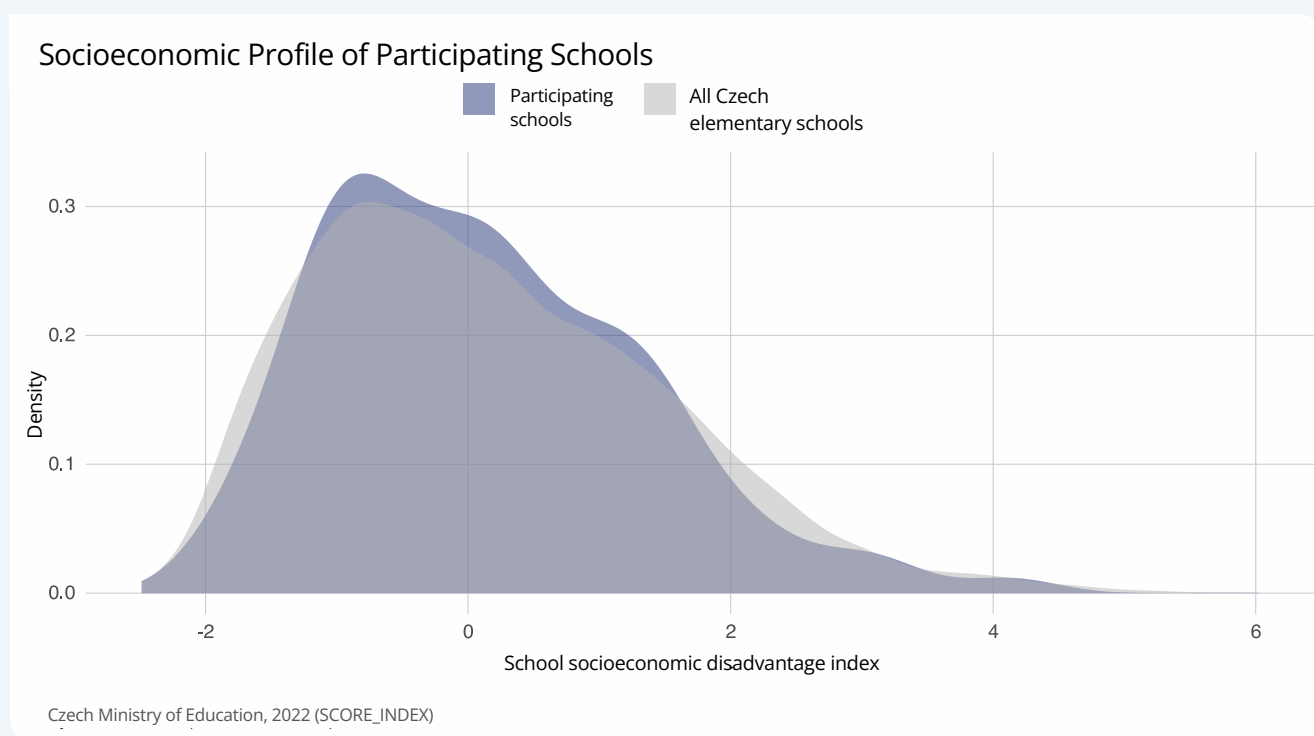


Schools participating in the project were equally distributed across the Czech Republic:



# Representativeness of Participating Schools

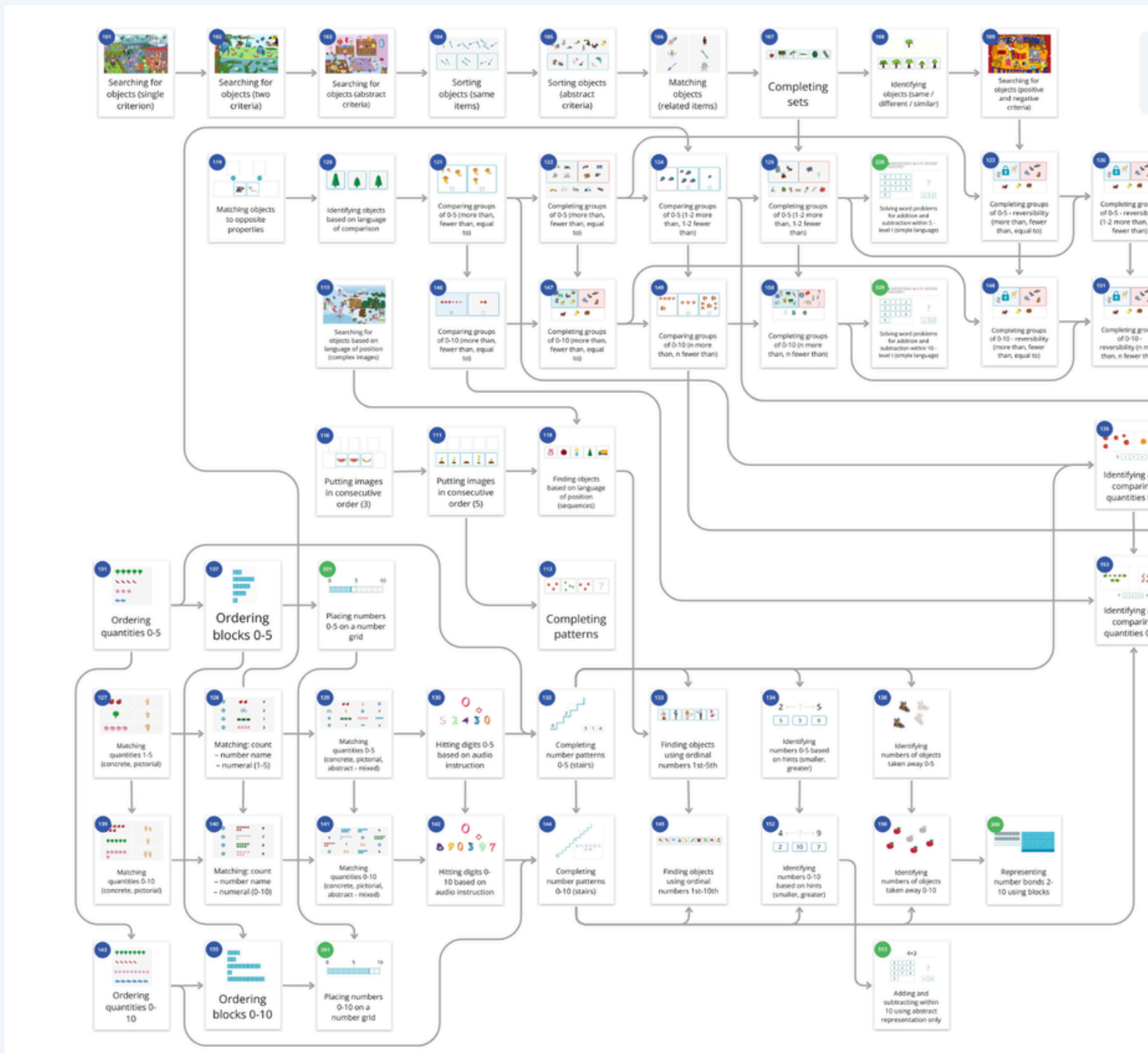
In addition to broad geographic coverage, participating schools closely reflected the socioeconomic profile of Czech elementary schools. This strengthens the value of the project as a national snapshot of early math readiness.



The socioeconomic profile of participating schools was close to the national distribution, suggesting that the project did not only reach a narrow group of schools.

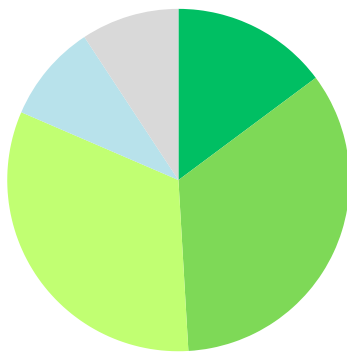
# Pedagogy

Levebee diagnostic assessment is based on our research into **early math skills dependencies**. This allows us to make the assessment **adaptive** and therefore fast, identify **root causes** and make predictions about **future struggles**.



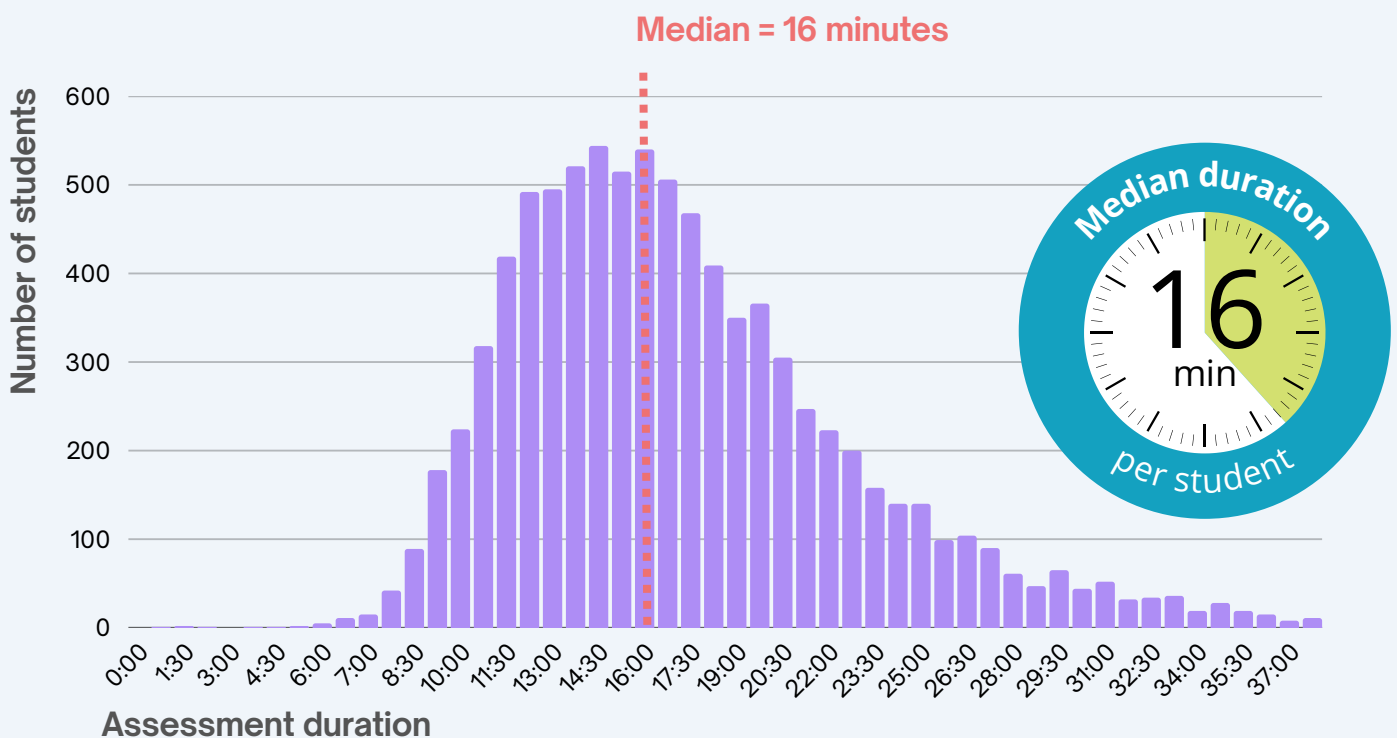
# Logistics

Levebee is designed to be accessible even for kids with special needs with minimal assistance. The median of the assessment duration is only **16 minutes**. This allows teachers to take the diagnostic assessment with the **whole class at once** on existing school devices.



**Did students complete the assessment without assistance from a teacher?**

- Yes, completely (16 %)
- Yes, almost completely (37 %)
- Exceptionally needed help (35 %)
- Needed help frequently (9 %)
- Other (3 %)



# Outputs for Teachers

Each teacher received a **detailed report** for each student as well as a **summary for the entire class**. The report is written in a simple language understandable even to teachers **without math pedagogy background**.

## Excerpts from the Class Summary

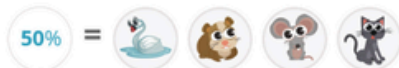
### ESSENTIAL: What to prioritize

▶ Although the student demonstrated a partial **understanding of numbers and the number range 1-5**, they were unable to **compare the number of objects** using the concepts of **n more than / n fewer than** in 1-5 range. This will limit them in learning numerical operations and solving word problems. [More ↓](#)



### DESIRABLE: What to consider teaching

⚠ The student is partially ready to understand numbers and numerical operations, but needs to become more **fluent in counting the number of missing objects up to 5**. This will help them in the future when learning addition and subtraction. [More ↓](#)



### MASTERED: What students can already do

✓ The student is ready to understand **numerical operations** in 1-5 range. [More ↓](#)



# Excerpts from an Individual Student Report

## Skill overview

Grouping

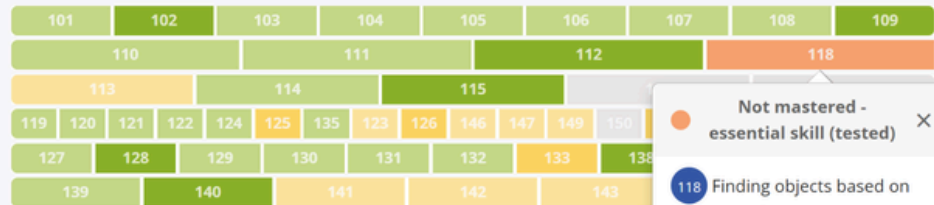
Arrangement

Spatial awareness

Comparison 0-5

Numbers 0-5

Numbers 0-10



- Not tested.
- Mastered (tested)
- Probably mastered (not tested)

- Not mastered - essential skill (tested)
- Not mastered - desirable skill (tested)
- May not have mastered (not tested)

**Not mastered - essential skill (tested)** ✕

118 Finding objects based on language of position (sequences)

[More information about exercise](#)

## 2 How to help the student

### 118 Finding objects based on language of position (sequences)



★☆☆ 54 %

STUDENT'S OPINION:  
Too hard

🕒 0 s

The student has not completed this exercise to the required level.

What may be the cause?

- ▲ The student's **understanding of terms related to relationships within sequences**, such as 'after', 'right after', 'before', 'right before', 'between', and others, appears to be **limited**. This suggests that they may also struggle to comprehend concepts such as 'far', 'close', 'by', 'above', 'below', and so forth.
- ▲ The student is **not prepared to grasp the connections between numbers**.  
For instance, to identify the number right after 2, all numbers after 2, or all numbers between 1 and 5.

What may help this student?

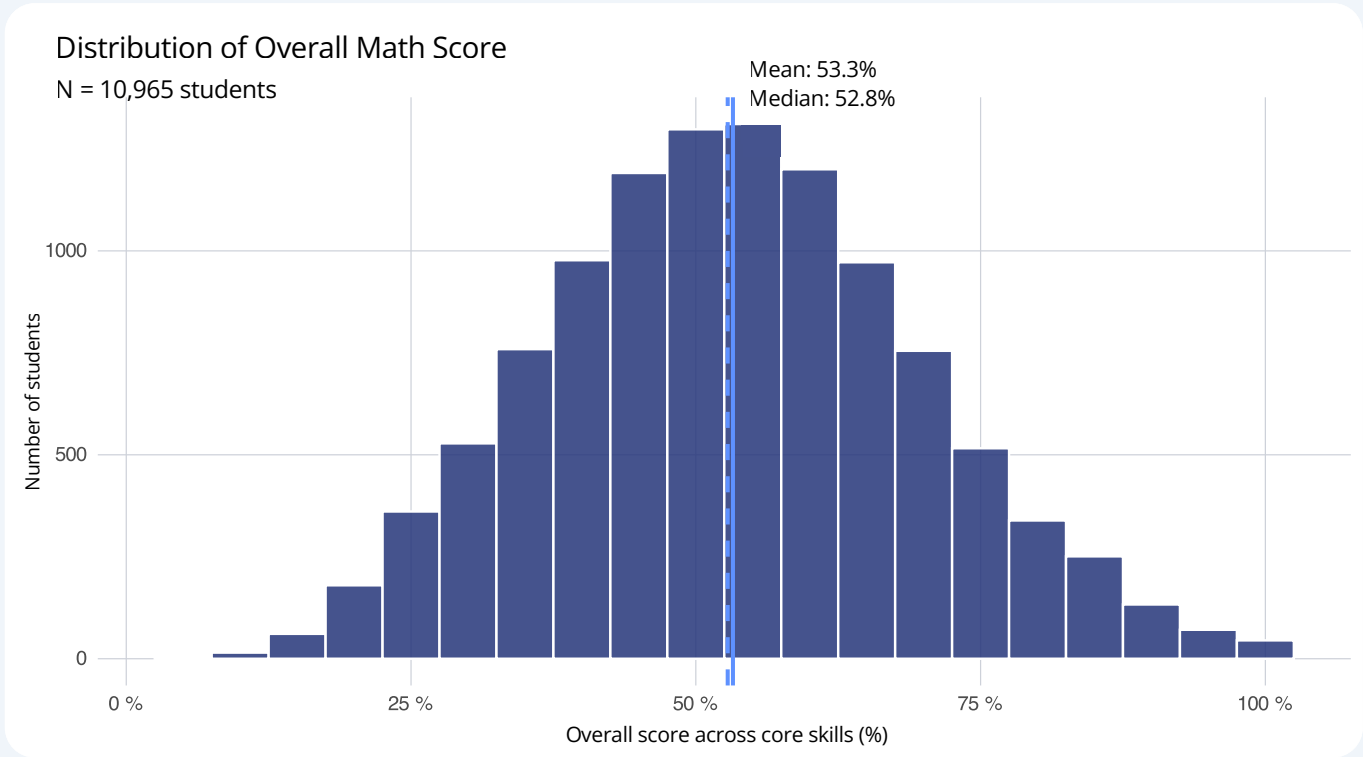
- 🔑 **Explain the spatial arrangement of objects.** Use terms such as 'near', 'distant', 'behind', 'inside', 'by', 'next to', 'between', 'in the middle', and so on. For example, say, "What object am I thinking about? My object is located in this room between ... and hanging above ..."
- 🔑 **Verify that the student can successfully navigate in a sequence of objects without relying on numbers.** For example, make sure that the student can identify what comes after, right after, what is in between, next to, etc.

# What the Data Revealed

Teachers reported that Levebee helped them notice gaps they would not have seen otherwise. The following charts show how these hidden gaps appeared in the 2025 data.

## Early Math Readiness Varies Widely

Students entered first grade with very different levels of early math readiness. The distribution shows that an average score alone does not tell the full story: teachers need to know which students already have solid foundations and which students need targeted support from the very beginning of the school year.

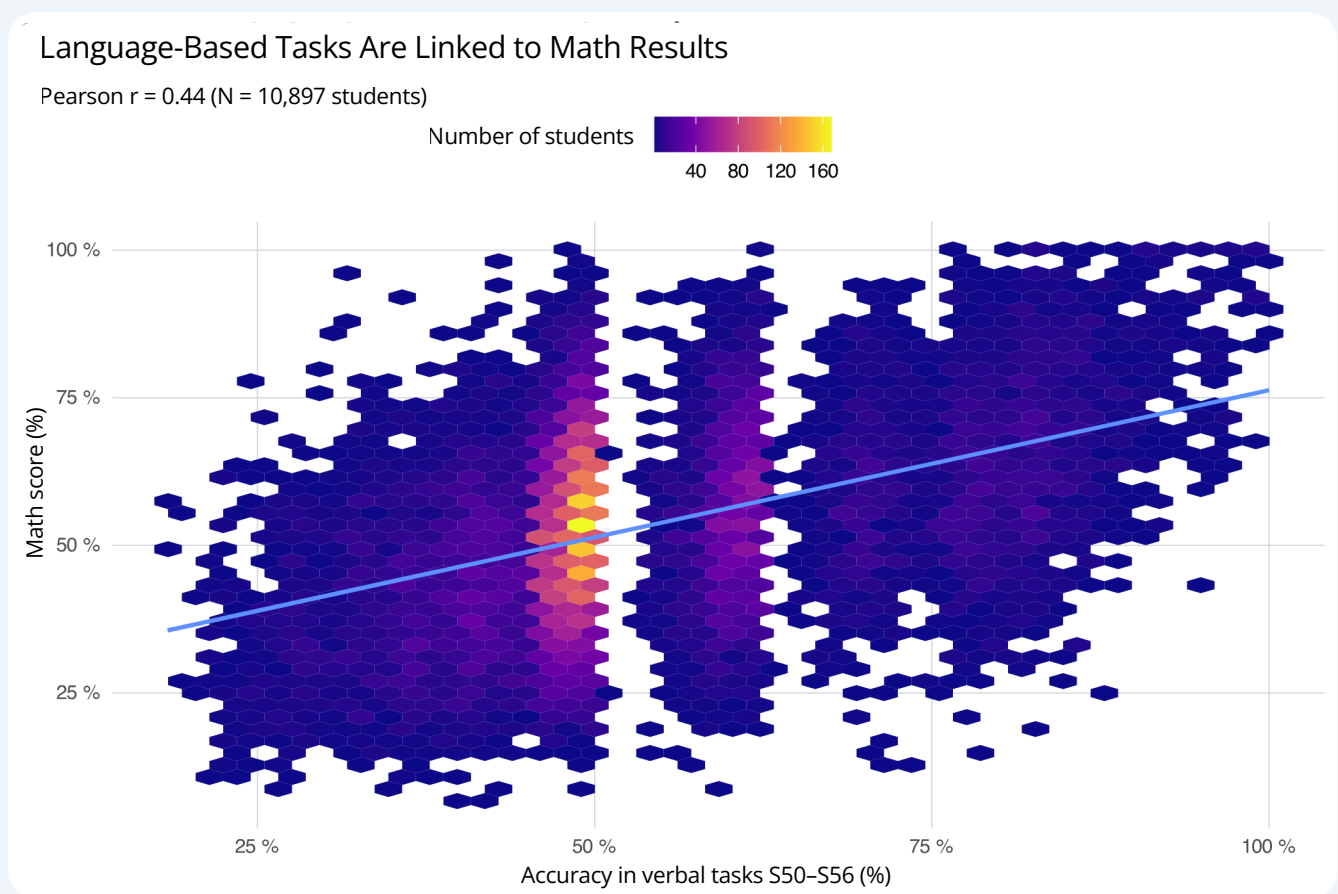


The results are widely distributed around the middle of the scale, which means the assessment can meaningfully distinguish different levels of readiness among incoming first graders.



## Connection Between Vocabulary and Early Numeracy Skills

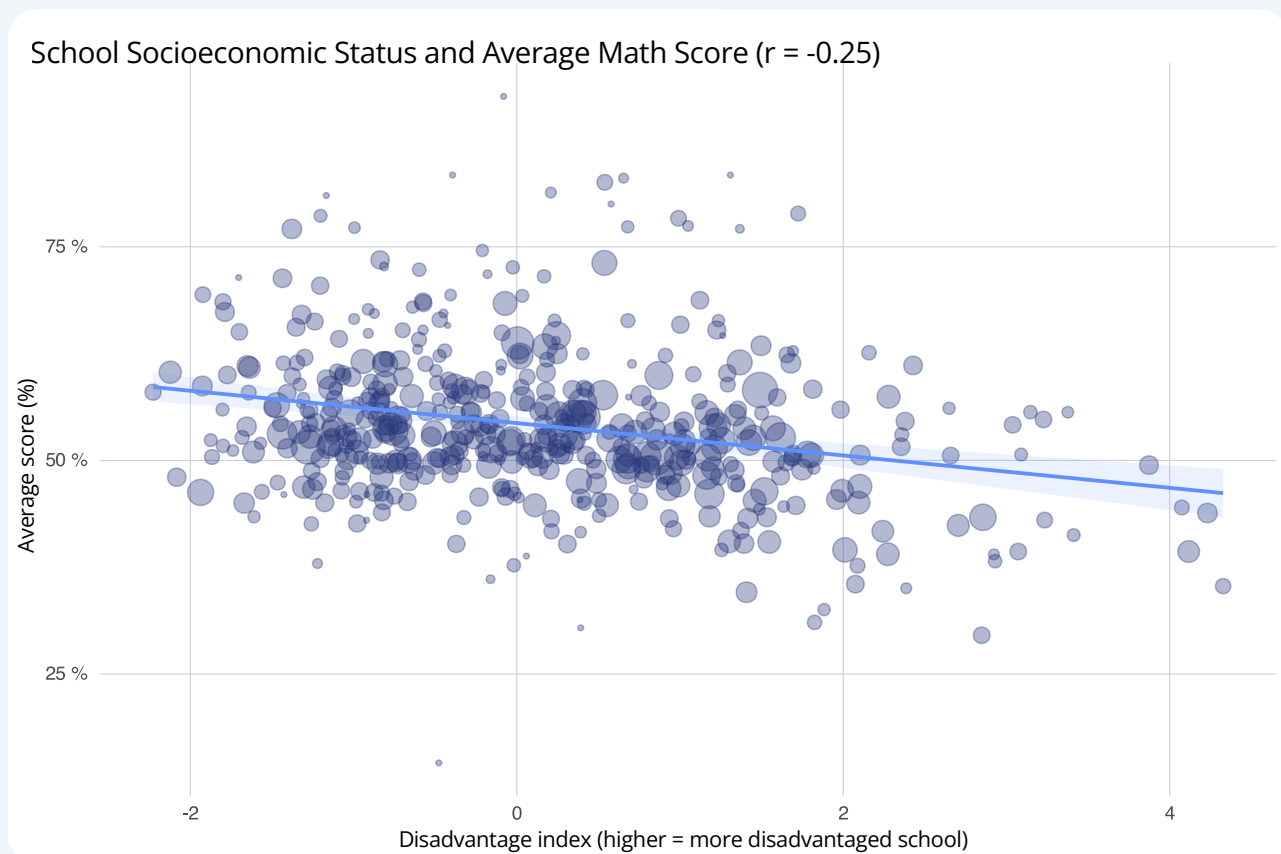
Many early math tasks require more than counting. Children need to understand instructions, comparison language, spatial relationships, and ordering words such as before, after, between, more, and less. The data show that success in verbal tasks is closely connected to overall math performance.



Students who performed better on verbal tasks also tended to achieve higher math scores. This suggests that some early math difficulties are not purely numerical; they are also connected to children's understanding of mathematical language.

## Socioeconomic Status Correlates with Math Score

The data also show a relationship between school socioeconomic status (SES) and average math scores. Schools serving more disadvantaged communities tended to have lower average early math readiness, highlighting the need for early, targeted support.



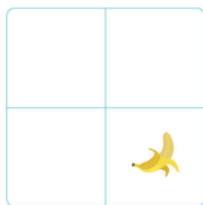
The negative correlation suggests that students in more disadvantaged schools tended to have lower average math readiness at school entry. The relationship is meaningful, but not deterministic: schools with similar levels of disadvantage still vary in their results.

## What Children Mostly Know and What Still Needs Support

At school entry, most children already understand basic spatial concepts on a grid, such as top left and bottom right. By contrast, concepts related to order in a sequence, such as before, after, between, first, and last, often still need reinforcement. These concepts are important building blocks for later understanding of number range.

### Spatial Orientation on a 2x2 or 3x3 Grid With Visual Support

Put the picture in the bottom-right box.



✓ Check

**66,93%**

of students mastered this skill  
(conservative estimate)

**70,80%**

generalizability coefficient ( $\varphi$ )

### Understanding Order in a Sequence

Select the last picture



↶

✓ Check

**39,14%**

of students mastered this skill  
(conservative estimate)

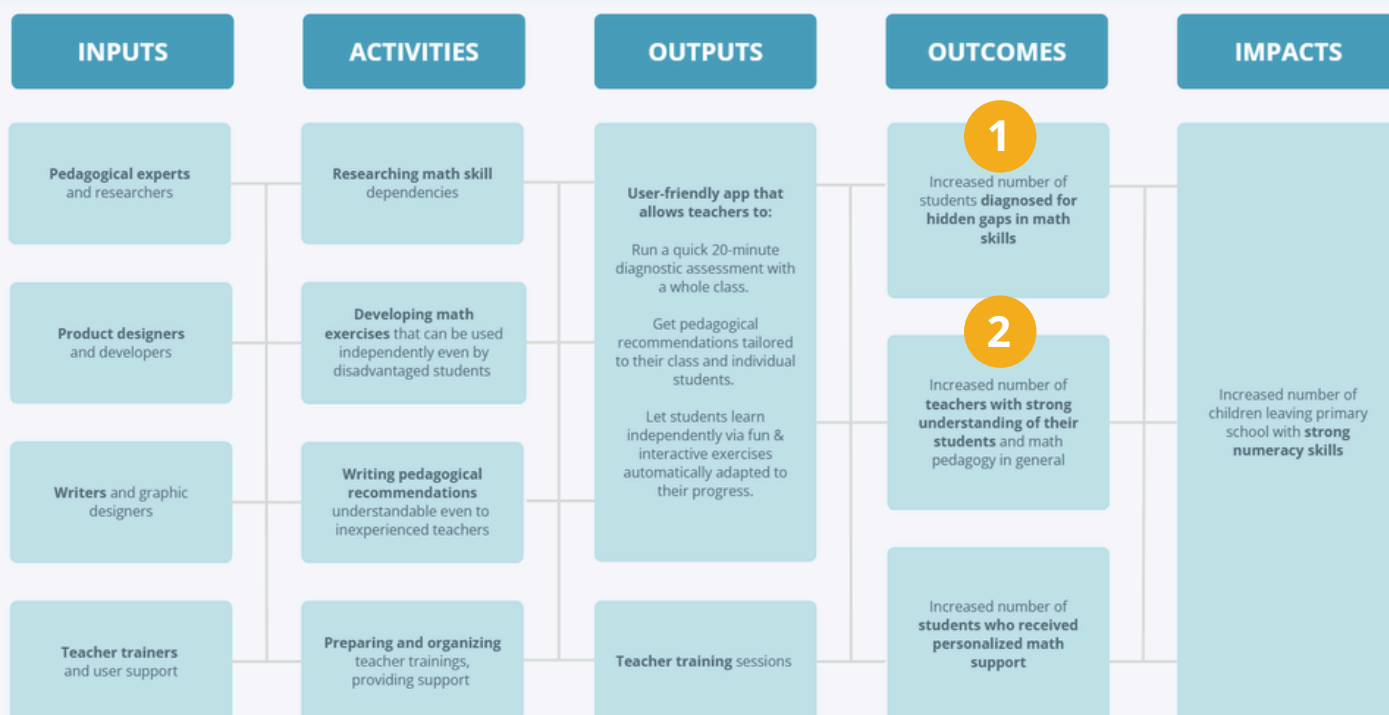
**62,56%**

generalizability coefficient ( $\varphi$ )

Most children can follow basic spatial instructions on a grid, but many still need support with concepts related to order in a sequence. These concepts are important for later understanding of number order and the number line.

# Achieved Outcomes

First two outcomes defined in the Logic Model of Levebee have been achieved.



**1** The **number of students diagnosed for hidden gaps** in math skills **increased** from hundreds to tens of thousands.

This was measured by the number of students who completed a diagnostic assessment using Levebee. In previous years, it is estimated that early math diagnostic assessments were administered to at most a few hundred students in the Czech Republic due to the time commitment of the non-digital process.



## 2

## Teachers' understanding of their students and math pedagogy has improved.

This was measured by surveying **1000+ teachers** who completed the diagnostic assessment with their class. They were asked to describe what they had learned thanks to Levebee.

All the kids enjoyed the diagnostics. They **had no feeling of failure** even in tasks that were difficult for them. Most of them had no problems with numbers and with matching the number of elements. The **concepts of before, after, between left-right, left-centre, etc. were problematic**. This needs to be addressed. I will be working with the grid, working with number line, etc.

**Dagmar, 1st grade teacher**

The students were very motivated. They enjoyed working in the Levebee. A **surprisingly large percentage of pupils had difficulty** with the principle of ordering objects, forming groups of objects and comparing them, and handling the combination of negative and positive conditions. On the other hand, all pupils were able to understand the concepts 1-5 and most children mastered the orientation in a 3x3 grid. The summary of the diagnostic results is a **great tool and inspiration for further work with children**. I want to include similar exercises as warm-ups, activity learning.

**Libuse, 1st grade teacher**

A great tool for **accurately mapping levels** in particular areas and catching weaker children. I **would never have gotten such an overview without this tool**. I would really appreciate something similar for reading.

**Jana, 1st grade teacher**

I **did not expect that a large percentage of students do not have anchored pre-math skills**. They could recognise the numbers 1-10 but were not very good at determining the order, and how much more/less was one of the hardest tasks ever. Thanks to the diagnostics, I **know we will have to spend more time on these skills than I anticipated**. I'm going to spend a lot more time on pre-math skills and link math to other subjects so we can catch up.

**Jana, 1st grade teacher**

I **was surprised by the result of the diagnostic for a very clever pupil** in terms of logical thinking and numerical calculation. His results were very poor. I **had no idea that he had not yet consolidated his knowledge regarding right-to-left orientation and navigation in a series** with which he struggled a lot in first grade. I am considering purchasing headphones for more frequent and easier use of the app in the classroom.

**Jitka, 1st grade teacher**

The children enjoyed the tasks very much, some of them started with home practice. I **know which areas to focus on** more, lots of pupils had problems with the concepts of more about/less about, comparing the number of objects, mental representation of number series in the range 1-10 without visual support. I **like the whole class summary**.

**Mirka, special ed teacher**

Most of all, I appreciate that the diagnostics **actually detect hidden gaps**. The great thing for me as an educator is that I can see the ongoing results of the students. I can look at each student individually + your app itself will recommend exercises to remediate that area. Last but not least, I have to mention that the students were very enthusiastic about the assessment, they enjoyed learning on the iPads. I **immediately incorporated** activities into the lessons where the **students were having the most difficulty**.

**Tereza, 1st grade teacher**

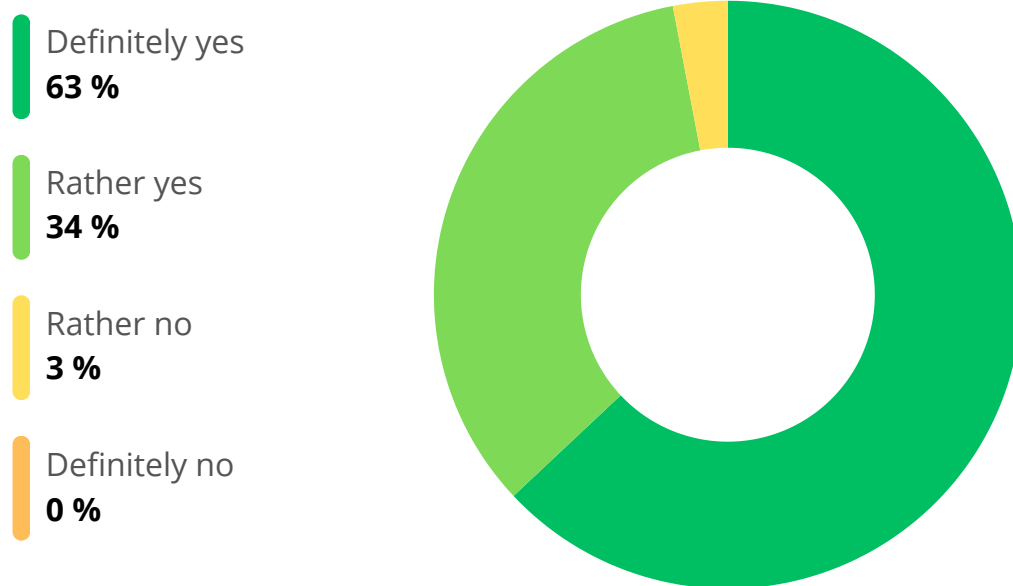
The children were excited about the tasks. They enjoyed the interaction, liked the voice output - **praise for completing the task correctly and encouragement** in case of a mistake. **The most difficult tasks were those** where the children manipulated the pictures according to the instructions, e.g. "There will be two more in the red box than in the grey box"... Next - cards with different numbers - logical series. Then also where they labelled the pictures in a row - according to instructions - e.g. "Which pictures are between the two given pictures?"... "Which pictures are between the 7th and 10th picture?" **They were mostly very good at linking numbers and counting**, and were also good at placing the picture in the box as instructed - top x bottom x middle, RxL. **We will practice the tasks regularly in school**.

**Oldriska, 1st grade teacher**

# Satisfaction Rates

**97% of teachers** who have tried Levebee **recommend** it to others. This creates an opportunity to repeat the project next year and **start a time series** for a long-term research.

Would you recommend your colleagues to carry out a math diagnostic assessment via Levebee with first-graders next year?



*Survey conducted in October 2024 among **1198 teachers** who have completed early math diagnostic assessment via Levebee with their class.*



# Further Research

The data collected during the project allows **researchers** to answer a variety of questions about **school readiness, math education, inequality**, and more.

The Math Without Barriers dataset is available for academic research and has already been used in analyses by **PAQ Research** and researchers from the **Massachusetts Institute of Technology**.



## Research Data Available for Academics



**18,000+  
Students**



**16 Math Skills  
& Vocabulary**



**AI Interaction  
Logs**



**Single CSV  
File (R-Ready)**

If interested, write to [support@levebee.com](mailto:support@levebee.com)



# About Levebee

Levebee is **one of the most disruptive EdTech startups** and SMEs as selected by the IMPACT EdTech programme co-funded by the European Commission to boost innovation in education throughout Europe.

Since its inception in 2014, Levebee as an SME has been at the forefront of developing innovative tools for early education. The platform has gained widespread trust and recognition, currently being utilized by over **1000 schools** and engaging more than **500,000 students** in diverse learning experiences.

A key strength of Levebee is its **commitment to inclusivity and accessibility**. The app is designed to cater to students from various backgrounds and with different needs, including those with autism, ADHD, aphasia, and dual-language learners.

In classroom settings, Levebee serves a dual purpose: it is both a tool for **personalised maths instruction** and a **formative assessment** instrument. Beyond its immediate impact on teaching methodologies, Levebee collects datasets that are invaluable to the research community.

Levebee has received **recognition** over the years for its contributions to education technology. In 2014, it was a finalist at the TechCrunch Startup Battlefield in London. The Vodafone Foundation in the Czech Republic supported Levebee in 2015 for its social impact. It was among the top 8 finalists in the 2021-2022 IMPACT EdTech Accelerator's 3rd Open Call. More recently, in 2023, Levebee was a finalist in the MIT SOLVE LEAP Challenge in the USA, reflecting its continued growth and relevance in the global education landscape.




# Thank you!



Thank you for taking the time to read this report. If you have any questions or would like to organise similar project in your country or district, please don't hesitate to reach out to us.

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