# Diversity as a resource in mathematics teaching

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This presentation is about diversity in mathematics classrooms, something all teachers need to relate to. A common way to meet diversity is Differentiated Instruction (DI). However, DI is questioned and might not be enough, and hence, ideas from DI and previous research about inclusion in mathematics and planning have been used to develop a framework. The framework, Diversity Valued Instruction (DVI), emphasizes diversity as a resource in mathematics teaching. Results from a pilot study in which a group of teachers was presented with the framework show that the deficit perspective dominates the discussion and that adjustments are mainly about compensating for deficits. However, there is a glimpse of DVI, and teachers express care for students. The results contribute with important insights in the design of an upcoming study.

A well-known fact in Swedish schools is that diversity among students is increasing, for example, by increased migration, socio-economic gaps, and recognition of neurodiversity. In mathematics classrooms, teachers must face this diversity and find ways to include and enable all students to learn mathematics. However, studies about inclusion and planning indicate challenges in succeeding with the assignment (Grundén, 2020; Roos, 2019). In Swedish mathematics classrooms, teachers often plan with “students in the middle” or “normal” students in mind (Grundén, 2020), unintentionally marginalizing those who deviate from this norm. This practice can hinder students’ inclusion (Roos, 2019) and create negative learning experiences. Hence, finding ways to create classrooms where diversity is celebrated, valued, and seen as a resource for learning is essential. A common way to meet diversity among students is Differentiated Instruction (DI). Although the meaning of DI seems to differ (Grunden & Roos, 2023) there are common features: Teachers need to be responsive to a range of differences among students and adjust what the teaching is about (content), how teaching is organized (process), and how students show what they have learned (product). However, there are indications that DI often falls short because it is seen as a set of activities without a deeper understanding of underlying principles. Instead, in an upcoming study, we want to advocate for Diversity Valued Instruction (DVI) (Grunden & Roos, 2023) and foreground students’ differences, celebrating and valuing them as natural resources for learning. By shifting our focus from differentiated to diversity-valued instruction, we hope to create more inclusive and equitable learning environments in mathematics.

As a first step, a pilot study with a group of five mathematics teachers in school years 1 to 6 was given a matrix where content, process, and product are headlines on columns and language, culture, cognition, and social are headlines on the rows, and instructions to discuss how to plan for teaching in each of the cells. For example, in the cell where content and cultural meet they should think about how to choose mathematical content to value cultural diversity. Preliminary results show that the teachers mostly talk about the diversity among students from a deficit perspective. For example, the teachers talk about students having ADHD not being able to concentrate, or students with bad short-term memory not being able to learn the multiplication table, and how they need to adjust their teaching based on these students’ deficits. It seems that adjustments are mainly about compensating for deficits, either by offering aids, such as preprinted multiplication tables or by removing problematic situations, for example, not giving homework. We interpret the dominance of the deficit perspective in the discussion as there are strong norms about what and how one should know mathematics. However, in the discussion, there is one glimpse of DVI reflection – the teachers talk about how students’ sharing of their different ways of understanding concepts can contribute to deeper understanding for all. On a couple of occasions in the conversation, the teachers begin to problematize how, through their teaching, they meet the diversity among the students. One example is when one teacher says: “Silent thinkers are expected to discuss”. However, the teachers do not grasp the opportunity to think about how to value the silent thinkers and what they bring to mathematics education.

The preliminary results from the pilot study leads us to two reflections. Firstly, thinking about students’ diversities as resources in teaching seems complicated and unusual. In the group of teachers, there seems to be a familiar and accepted way of talking about students’ differences based on a deficit perspective where the ways in which the student differs from the norm must be compensated for. Secondly, the teachers seem to care about the well-being of their students, and with this care for the students as a basis, we believe that they could have been thinking about diversities as resources if they had been challenged in the discussion. These reflections lead us to rethinking the design. Obviously, the matrix did not support the teachers well enough; hence, we ask ourselves – and you – how to design a study illuminating diversity as a resource.

### References

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