

# Reading and math skills of students with special educational needs in regular and special classes

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## Summary

### Introduction

Since 2010, the Estonian education system has been guided by the Basic Schools and Upper

Secondary Schools Act, which stipulates that students with special educational needs (SEN) are given the opportunity to study in the regular classes of the school based on their place of residence (Põhikooli- ja gümnaasiumiseadus, 2010). A three-tiered system of support (general, intensified and special support) has been established in Estonia to support students with different abilities, including with SEN. The need for receiving additional support is decided by the school or involves an out-of-school counselling team. In Estonian mainstream schools, around half of students with SEN are in regular classes and half in special classes (EASIE, 2020). For the purposes of this study, students with SEN are considered to be those who have been assigned either intensified or special support. So far, research in the Estonian context has investigated the evaluations and attitudes of different parties (child, family, teacher, teachers and professionals who train or advise teachers, school leaders, institution, state) about the effectiveness of inclusion (Häidkind & Oras, 2016; Kivirand et al., 2020; Nelis & Pedaste, 2020; Pedaste et al., 2021; Räis et al., 2016), or what the differences in beliefs are in Estonian and Russian language schools (Loogma et al. 2009; Ugaste et al., 2014). But so far there has been only one study about the cognitive factors associated with class placement of students with mild intellectual disability (Kivirähk & Kiive, 2022). The aim of this research is to describe the relationship between the reading and math skills of students with special education needs learning in a regular or special class. Associated with this aim, we also investigate what percentage of SEN are included to regular classes of mainstream schools in Estonian- and Russian-language schools and compare the math and reading skills of third and sixth grade students with and without SEN. The results of the study will provide insights into the academic skills and

placement of students with SEN and whether there are differences between the skills of students with SEN in regular and special classes in mainstream schools. The research questions are the following:

1. How do the reading skills of students with SEN in regular and special classes differ in Grades 3 and 6?
2. How do the math skills of students with SEN in regular and special classes differ in Grades 3 and 6?

Earlier studies have shown slightly different results between class placement and academic skills of students with SEN (Dalgaard et al., 2022; Hienonen et al., 2021, Kivirähk & Kiive, 2022; Krämer et al., 2021; Ruijs & Peetsma, 2009). The reasons for this can be many, such as how the learning process is organized and SEN definition, which can vary from country to country.

## Methodology

### *Participants and procedure*

The data was collected in autumn 2019 in the framework of the project „Implementation of Assessment Tools for Basic Competences for Basic Levels I and II in Basic Schools: Pilot Project for Mathematical and Functional Literacy Assessment”, conducted at Tallinn University, which aimed to develop electronic assessment tools for math and reading competences for third and sixth grades (see Toomela et al., 2020). The sample consisted of 3,369 third grade children from Estonian- and Russian-language schools (mean age = 9.85 years, SD = 0.35; 50% were boys; from 209 classes; from 135 schools) and 3,340 sixth grade children (mean age = 12.85 years, SD = 0.36; 51% boys; from 200 classes; from 134 schools). Students in language immersion classes were not included in the sample.

### *Assessment tools*

All the assessment instruments used in the study are electronic and standardised (see Toomela et al., 2020). *Reading fluency* was assessed as the accuracy and speed with which students could read words. *The reading comprehension* task assessed how accurately students could answer questions about the text they had read. *Calculation skills* were assessed with 10 calculations including addition, subtraction, multiplication, and division with natural numbers. *Word-problem solving* was assessed with tasks including word-problems with multiple calculation steps and knowing units of length, mass, and time.

## Results and discussion

Similar to previous studies (Lenkeit et al., 2022; Mattison et al., 2022), the results of the present study showed, first, that the reading and math skills of students without SEN were better than those of students with SEN in both third and sixth grades in Estonian- and Russian-language schools, except in third grade of Russian-language schools for word-problem solving. Second, there were no differences in the reading and math skills of students with SEN in regular and special classes in Estonian-language schools. Similarly, it has been previously found that there may be no differences in academic skills between students with SEN in regular and special classes (Dalgaard et al., 2022; Hienonen et al., 2021; Ruijs & Peetsma, 2009). These results suggest that in cross-sectional studies in Estonian-language schools, an inclusive or segregated classroom environment is not associated with student academic success. At the same time, in the sixth grades in Russian-language schools, students with SEN in regular classes performed better than students with SEN in special classes in solving word problems. Although this is not longitudinal study which would provide a more precise overview of the effects of inclusion, these results suggest that inclusion can be successful in Russian-language schools. At the same time, one reason why students with SEN in regular classes in Russian-language schools achieved better results in word problems may be due to selection bias – the few students with SEN who are integrated into regular classes may simply possess better academic skills. In the sixth grades, the proportion of students with SEN in Russian-language schools (20%) was much lower than in Estonian-language schools (50%). In the third grade, the proportion of students in regular classes in Russian-language schools was so low that it was not practical to compare the results of special and regular classes at this grade level. Based on the present study, it is not possible to say why so few children with SEN in Russian-language schools are included in regular classes, but there may be several reasons. Inclusion of students with SEN in regular classes requires additional resources – teachers need additional training on how to support students with SEN and how to ensure that other students do not suffer a drop in academic success; competent support staff are needed to support students with SEN in regular classes; teachers and support staff need additional supporting materials and training on inclusion, often in their mother tongue; rooms need to be designed for students with SEN and extra time taken to enable different parties to work better together (Farrell, 2000; Kivirand et al., 2020; Räsä et al., 2016). Thus, in Russian-language schools only students with SEN who can manage inclusion without additional resources can be included in regular classes. Attitudes have also been identified as one of the barriers to inclusive education. School leaders may have

a mostly positive attitude towards the vision of inclusive education but if the necessary resources are scarce, the practical implementation of inclusion can be difficult (Pedaste et al., 2021). There is also still a debate on whether to include all students or some students (Leijen et al., 2021) and how different parties could work together to achieve better results (Nelis & Pedaste 2020). Estonian schools are divided into three from the point of view on inclusion – inclusive schools, schools in transition and traditional schools. (Räis et al., 2016). The low level of inclusion of students with SEN in Russian-language schools may also be related to the preference for traditional rather than constructivist learning methods (Loogma et al., 2009; Ugaste et al., 2014), which may become an obstacle to the inclusion of students with SEN in regular classes.

In summary, as expected, the reading and math skills of students without SEN were better than those of students with SEN (except in grade 3 Russian-language schools, where the difference was not statistically significant). At the same time, there were no differences in academic performance between students with SEN in regular classes and students with SEN in special classes in Estonian-language schools. However, in the sixth grade, students with SEN in regular classes in Russian-language schools performed better in word problems than students with SEN in special classes. It was also found that more students with SEN were included in regular classrooms in Estonian-speaking schools compared to Russian-speaking schools. The study provides a first overview of inclusive education in third and sixth grades in Estonian- and Russian-language schools and SEN students' language and math skills when they are included in regular classes or when they learn in special classes in mainstream schools.

*Keywords:* reading skills, math skills, students with special needs, inclusive education