

The impact of different bilingual education models on learning outcomes in Estonian as a second language

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Summary

The transition of Russian-language schools to Estonian-language education and the increasing number of non-native Estonian-speaking students in Estonian-language schools have made Estonian-language acquisition a pressing topic. However, little research exists on how non-native-speaking children acquire Estonian. While some studies have examined vocabulary, grammatical development, and early language acquisition in primary school contexts (see Argus & Rütmaa, 2024; Baird & Argus, 2022; Baird et al., 2022), the differences in language acquisition across various school models remain unexplored.

Internationally, limited research compares second-language acquisition in different school types. Studies suggest mainstream schools may be less effective for second-language acquisition than immersion or transitional programmes (see Thomas & Collier, 2002). However, these findings are not fully applicable to Estonia's unique post-Soviet demographic and linguistic context. Estonia's education system includes Estonian and Russian medium schools, but immersion schools also exist. However, these models lack detailed analysis.

This article addresses the research gap by describing various models used in Estonia and examining how different bilingual education models relate to non-native-speaking students' Estonian proficiency, using data from a national project supporting the integration of such students into Estonian-language education.

Globally, many students entering school systems lack proficiency in the societal language, necessitating different approaches to second-language education. Countries employ various models, tailored to their societal and linguistic contexts. These models mainly differ in their goals (e.g., promoting bilingualism versus societal language acquisition) and the balance between the first language (L1) and the target language (L2) in instruction.

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Prominent models include transitional bilingual education, where L1 is used temporarily in subject instruction while teaching L2 separately, and two-way immersion programmes, which blend instruction in L2 and another selected language (Freeman, 2007). Usually, an attempt is made to have an equal number of students from both languages in the class. Two-way immersion programmes can vary in their language distribution, such as 50:50 or 90:10 models, with adjustments over time (Tedick, 2015). Additionally, English as a Second Language (ESL) programmes are standard, with approaches like pull-out, push-in, and sheltered instruction (Freeman, 2007). Submersion models, where all education occurs in L2 regardless of students' home language, are also used (Kekejian et al., 2024).

Research highlights bilingual programmes' effectiveness compared to monolingual models, showing better L2 proficiency and academic outcomes (Rolstad et al., 2005). For instance, two-way immersion often fosters faster L2 acquisition and improved academic success. However, outcomes vary depending on implementation, teacher quality, and the programme's ability to support L1 development alongside L2 learning (Thomas & Collier, 2002; Valentino & Reardon, 2014). Studies also suggest that language skills develop at different paces in bilingual settings, with long-term advantages often emerging later.

In Estonia, research on bilingual education models and outcomes is scarce. Existing studies mainly focus on parent and teacher attitudes or general instructional methodologies (Klaas-Lang et al., 2023; Metslang et al., 2014; Rütmaa et al., 2023). Comparative data from other countries, like the United States, suggest that societal and educational support structures significantly impact language learning outcomes. Thus, while global findings can guide policy, their applicability to Estonia's unique context requires caution.

The following research questions were addressed:

1. What types of language learning models can be identified in the participating schools?
2. How and to what extent do the Estonian language skills of students differ based on the educational model used in their school?
3. Are the results of different teachers' classes within the same educational model similar or different, i.e., can different implementations of the same model lead to varying outcomes in students' language proficiency?
4. What connections exist between the school's educational model and the different subsections of the language proficiency test?

The study involved 511 students aged 7–9 (at the start of the project) from 18 schools across Estonia. Schools developed tailored language learning models

using project-specific guidelines and iteratively refined them throughout the project. A test was conducted in spring 2024 to assess students' language proficiency. It focused on the use of grammatical categories and phrase types. The test included verb forms (11), noun forms (11), and phrase types (5 categories), and results were analysed using Kruskal-Wallis tests to determine significant differences between schools with different language models.

The study analysed the outcomes of Estonian language learning in schools with different language instruction models. The schools were categorised into five models based on the proportion of Estonian-medium lessons and students' first languages (L1):

1. **Estonian-medium schools with few non-native speakers:** Instruction is in Estonian, and additional support is provided for non-native speakers (e.g., pull-out classes). L1 development is not supported.
2. **Estonian-medium schools with many non-native speakers:** Instruction resembles submersion models, with minor support for students' L1.
3. **Russian-medium schools with all lessons in Estonian:** Full immersion with mandatory L1 lessons.
4. **Russian-medium schools with some lessons in Estonian:** Transitional bilingual education with an increasing share of Estonian-medium instruction.
5. **Russian-medium schools with bilingual lessons:** Classes gradually transition to Estonian-medium instruction, fostering bilingualism.

Tests measuring grammatical categories and phrase types revealed that students performed best in verb forms (mean 7.12 out of 11), followed by noun forms (mean 5.9 out of 11), and struggled most with phrase types (mean 2.72 out of 5). It was also evident that Estonian-medium schools consistently outperformed Russian-medium schools. The mean scores for verb and noun categories and the phrase type category were notably higher in Estonian-medium schools. Statistical analysis confirmed significant differences between Estonian- and Russian-medium schools ($p < 0.001$ for all categories). However, no significant differences emerged within Russian-medium schools except for nouns between Models 3 and 5. Despite overall trends, individual variation was substantial, with some Russian-medium school students achieving high scores.

The findings highlight the disparities between language learning outcomes in different instructional models. Estonian-medium school students outperformed those in Russian-medium schools, despite the latter employing various bilingual education models. This outcome must be placed into Estonia's unique sociolinguistic context, where Russian speakers can manage without speaking

Estonian. The study emphasises the crucial role of language input, both within and outside the classroom, highlighting the limited language exposure of students in Russian-medium schools. Furthermore, the study underscores the significant impact of individual teachers on student outcomes, even within the same school and using the same bilingual education model.

The study examined whether the school's language learning model impacts different parts of a language proficiency test. It was hypothesised that in schools providing more natural Estonian input (e.g., Estonian-medium schools) students would better acquire longer language units, such as phrases. However, no apparent differences were found between Estonian- and Russian-medium schools. Interestingly, significant variation appeared between teachers within the same school, suggesting that teaching practices might play a key role. Due to a lack of systematic data on teaching methods and input quality, the reasons for these differences remain unclear.

Keywords: Estonian as a second language, grammar acquisition, second language acquisition