

Gender differences in the reading literacy of Estonian basic school students

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Summary

Literacy is traditionally understood as the ability to read and write (Gee, 2012; Harris & Hodges, 1995), and it is an essential key competence (European Commission, 2019). The PISA (Program for International Student Assessment) 2018 definition of reading literacy is as follows: “reading literacy is understanding, using, evaluating, reflecting on and engaging with texts in order to achieve one’s goals, to develop one’s knowledge and potential and to participate in society” (OECD, 2019a). The PISA reading literacy assessment is built on three criteria: 1) situation – the range of broad contexts or purposes for which reading takes; 2) text – the range of material that is read; 3) processes – the cognitive approach that determines how readers engage with a text (OECD, 2019c). There are four situations in the PISA study: personal, public, educational and occupational. The situations may overlap, e.g. if the text is intended to entertain and educate the reader, it falls within the personal and educational situation. The text situation also determines the text selection. The PISA reading tasks are based on the number of texts (single or multiple) and the type of text (description, narrative, argumentative, exposition, instruction, transactional, interaction and multiple) (OECD, 2019a). Reading different text types requires various types of background knowledge and skills (Gee, 2012), so it is essential to know how students read specific text types. In constructing read meaning, the successful reader uses various processes to find, understand, and memorise information (Kärbla, 2020; Oakhill, Cain, & Bryant, 2003) and to assess the information’s relevance and validity (Richter & Rapp, 2014). The number of texts in the PISA reading tasks determines which process the student is expected to use. In the single text items, the students use scanning and locating, literal comprehension, assessing quality and credibility, and reflecting on content and form. In the multiple text items, searching and selecting the relevant text, inference comprehension, corroborating, and handling conflict

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are used (OECD, 2019b). The difficulty of tasks depends on the text format variables, the number of texts, and the cognitive processes used in the tasks (Kirsch, 2001).

The results of many reading studies show a gap between boys' and girls' performances (e.g. National Assessment of Educational Progress [NAEP], 2019; OECD, 2019c). Differences have emerged when comparing general reading performance (OECD, 2019c), reading various text formats, using specific cognitive aspects (Puksand, 2019), and different types of tasks (Schwabe, McElvany, & Trendtel, 2015). Therefore, it is crucial to know the boys' weaknesses in order to give them better support and improve their reading skills.

The study aimed to describe boys' and girls' performance based on the text situation, type of texts, and the cognitive process expected in solving the task. To meet this goal, we establish three research questions.

- 1) What are the gender differences in solving tasks based on different text situations?
- 2) What are the differences between boys and girls in solving tasks based on different types of text?
- 3) What gender differences appear in solving tasks that require different cognitive processes?

Method

The PISA 2018 data were used in this article to analyse the reading skills of Estonian students. The survey involved 5,316 Estonian and Russian speaking students, of whom 49.9% (2,651) were girls and 50.1% (2,665) boys. 75% of students took the test in Estonian and 25% in Russian. To find the gender differences in reading tasks' performance, we compiled a new data file based on the PISA study data table and noted the average percentages of all tasks solved by Estonian boys and girls. Because each PISA reading task was based on the particular text types, expressed a specific situation, and required students to apply different cognitive processes, three characteristics were added to each task: situation ($n = 5$), text type ($n = 8$), and cognitive process ($n = 7$). Then, based on the average percentages, the total scores for the situation types, text types, and cognitive processes for boys and girls were calculated separately. SPSS Statistics version 26.0 of the statistical package was used to analyse the frequency of tasks and find the differences between boys and girls.

Results and discussion

The results of the PISA 2018 reading tasks were analysed based on three criteria to identify the differences between boys and girls. Girls performed better than boys in all three criteria: based on different situations, text types, and cognitive processes used to solve the task. The minor differences were in performance compared to the use of cognitive processes. The most significant gap was between the various text types. These results show that boys need more guidance than girls.

The results indicated that the most familiar situations for boys and girls were personal life and education. In these situations, personal e-mails, fiction and textbooks are used as reading texts (OECD, 2019a). Students are most exposed to these texts in their daily lives (Puksand, 2014b). Texts with a public life and work situation were more difficult for students because they read such texts less. However, the most difficult tasks for the students were those where several texts were used, and thus they had to focus on various situations. The students had to orientate in different situations and read several texts in such tasks. Dealing with such tasks increased the volume of information processing: in addition to searching for information, students had to understand how the information was interconnected. Using multiple texts also required the cooperation of several memory systems (short-term, long-term and working memory) (Banas & Sanchez, 2012).

The analysis of the tasks with different text types showed that both boys and girls read well transaction and interaction texts. These items include the texts of the personal life situation that students use most often in their daily lives: e-mails and other (web) communication (OECD, 2019a). Girls tend to write more e-mails and use computers to communicate more than boys (Puksand, 2011). Therefore, girls performed better in tasks with these text types. The most difficult tasks were again based on several texts, which used the diverse text type. As different text types reading requires different skills (Gee, 2012), tasks with several text types were more complicated.

Boys' results were worse than the girls in tasks requiring cognitively simpler processes, but the gender difference was minimal in more complicated tasks. The most straightforward tasks for students were to represent the literal meaning of the information. Finding literal information is the lowest level of comprehension of a text, in which the students find clearly presented information in the text and draw conclusions from it (Kibui, 2012). Thus, it is not surprising that these tasks are the easiest for students. The tasks of finding information, which required reviewing the text and searching for and selecting the information or a relevant part of the text, were not difficult for the

students either. However, the tasks required to assess the information's quality and credibility and detect and handle conflict proved complicated and equally difficult for boys and girls. Both processes use text evaluation, which is the most complex cognitive level (Basabara et al., 2013; Kärbla et al., 2018). At the evaluation level, the student must read between the lines, compare new information with the previous one, and understand the author's intentions (Basabara et al., 2013; Kibui, 2012). Besides, the PISA tasks require conflict detection and handling the use of multiple texts (OECD, 2019a).

The results of this study showed that both boys and girls had problems with multiple-text tasks. Their performance was worse in the tasks with diverse situations, text types, and items that required detecting and handling conflict. This research provides practical recommendations for using reading assignments in the classroom.

- 1) When designing reading tasks, it should be borne in mind that texts relating to public life and the work situation should be used more in the third stage of basic school. Although these situations are less familiar to students, they ensure that young people cope better in society.
- 2) To develop boys' and girls' reading skills, teachers should use more reading tasks based on several texts in teaching. Such tasks are usually more difficult for students, as taking into account different situations and text types requires more effort from students but allows for more significant development.
- 3) When designing reading tasks, it should be considered what cognitive processes are required in the tasks. Tasks that require assessing the quality and reliability of information and detecting and dealing with conflict should be used more.

Keywords: literacy, reading literacy, PISA, comprehension tasks, gender gap