MAILE KÄSPER

Supporting primary school students' text comprehension and reading interest through teaching strategies

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Supporting primary school students' text comprehension and reading interest through teaching strategies

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LIST OF ORIGINAL PUBLICATIONS

The doctoral thesis is based on four original publications, which are referenced in the text by their corresponding Roman numerals:

I   Uibu, K., & **Timm, M**. (2014). Sõnasemantika ja teksti mõistmine põhikooli esimeses ja teises kooliastmes. *Eesti Rakenduslingvistika Ühingu aastaraamat*, *10*, 319–334. https://doi.org/10.5128/ERYa10.20

II   **Käsper, M**., Uibu, K., & Mikk, J. (2020). Primary school teachers' teaching strategies for the development of students' text comprehension. *Education 3–13*, *48*(5), 512–526. https://doi.org/10.1080/03004279.2019.1623282

III **Käsper, M**., Uibu, K., & Mikk, J. (2018). Language teaching strategies' impact on third-grade students' reading outcomes and reading interest. *International Electronic Journal of Elementary Education*, *10*(5), 601–610. https://doi.org/10.26822/iejee.2018541309

IV **Käsper, M**., Uibu, K., & Mikk, J. (2020). The effects of teaching strategies on primary school students' reading outcomes and interest in reading. *L1 – Educational Studies in Language & Literature, 20*, 1–24. https://doi.org/10.17239/L1ESLL-2020.20.01.12

The author contributed to these publications as follows:

For Article I: researching theoretical bases, assisting in data coding and analyses, and writing the article in cooperation with a supervisor.

For Article II: constructing the theoretical framework, assisting in the development of the methodology, collecting and entering data, collaboratively analysing and reporting the data and interpreting the results, and writing the article as the first author.

For Article III: establishing a theoretical framework, formulating research questions, contributing to the design of the study, collecting and analysing data, reporting and interpreting results, and writing the article as the first author.

For Article IV: designing the study, developing the methodology, formulating the hypothesis, collecting the data and conducting analyses, interpreting the results, and writing the article as the main author in cooperation with supervisors.

1. INTRODUCTION

1.1. Overview of the research context

The ability to read is considered a basic life skill that will provide a cornerstone for students' success in all school subjects and in life overall (Oakhill et al., 2019; OECD, 2019; Viljaranta et al., 2017). To read but not comprehend the meaning does not serve this purpose, which is to acquire new knowledge, to expand vocabulary, and to enjoy the experience. Comprehending the text is a complex activity whereby students need to decode words and analyse the information (Butcher & Kintsch, 2013; Cain & Oakhill, 2011). Text comprehension is affected by several factors, such as students' home environment, parents' educational level, text-related factors, and student- and teacher-related factors (OECD, 2019; PIRLS, 2016). Student-related factors (such as vocabulary development, reading interest, age, and gender differences), text-related factors (such as readability and text difficulty), and teacher-related factors (including teaching strategies) are considered to affect the development of text comprehension in native language lessons (Alvermann & Eakle, 2003; Cain & Oakhill, 2011). Here, the term 'native language' represents Estonian as a first language throughout the thesis.

Among student-related factors that affect text comprehension, vocabulary plays an important role. It is possible for students to read all the words in a text but to understand very little of the meaning; therefore, good text comprehension depends on knowledge of the words contained within the text (Lervåg & Aukrust, 2010; Oakhill et al., 2019; Wigfield et al., 2016). When students start primary school, they will differ substantially in how quickly they acquire the ability to decode words in text (Oakhill et al., 2019). It has been established that students will not be able to understand a text if they cannot decode a reasonable number of words in it (Schmitt et al., 2011). According to Nagy & Scott (2000), approximately 90% of the words of a text need to be known for primary school students to have a good chance of understanding the content. Moreover, the relationship between text comprehension and vocabulary is reciprocal (Gentilini & Greer, 2020). A limited vocabulary results in reduced text comprehension, which in turn constrains students' appetite for further reading (Torppa et al., 2020).

Interested students who are willing to read in their leisure time can enhance the necessary prerequisites of reading comprehension such as vocabulary (Torppa et al., 2020). Students' emotional engagement is a key component of their interest in reading; therefore, students should enjoy reading, feel competent in the reading process, and recognise the progress they are making (Becker et al., 2010; Dong et al., 2019). In time, interested readers will read more and increase their text comprehension skills and are more likely to be interested in further reading with more difficult texts, thus driving their reading progress further (Guthrie et al., 1999; Torppa et al., 2020).

Differences in students' age and gender are also considered in the context of text comprehension. At the beginning of primary grades, text comprehension is

associated with students' phonological skills; however, in the later primary grades, comprehension is related more with specific knowledge of how to receive, summarise, and analyse new information from the text (Nouwens et al., 2018; Walpole et al., 2017). In primary school, reading texts should be age-appropriate to enable students to gain new information from them. When students begin primary school, they will inevitably vary in their levels of exposure and familiarity with academic skills, including vocabulary and reading (OECD, 2019). Studies carried out across a range of countries and educational contexts demonstrate that students who enter school with weak pre-reading skills (such as decoding) run a high risk of being among the poorest readers at the end of the first year of school (Torppa et al., 2017; Walgermo et al., 2018). In addition, text comprehension and reading skills can vary by gender (Klecker, 2006; Lynn & Mikk, 2009; Mullis et al., 2003; Mullis et al., 2007). There are significant differences in how boys and girls learn to read (Prado & Plourde, 2011). This could be due to girls' higher reading interest (Jacobs et al., 2002; Lerkkanen et al., 2012b) or girls having more advanced mental development than boys during primary grades (Logan & Johnston, 2010; Prado & Plourde, 2011). Although differences in reading interest between boys and girls are present, the differences should not be of major concern to teachers when planning instruction (Lerkkanen, 2018).

Text comprehension can also be affected by teaching strategies (Alvermann & Eakle, 2003; Cain & Oakhill, 2011). Teaching strategies are derived from various instructional approaches and theoretical concepts (Halliday, 1993). The development of text comprehension ability requires prudent, age-appropriate instruction using diverse teaching strategies (Calero & Escardíbul, 2019; Foorman et al., 2006; Kikas et al., 2016), and instruction tailored according to students' levels of performance is the most efficient way of supporting the development of their reading skills (Connor et al., 2013; Nurmi et al., 2012). At the beginning of primary grades, learning is more integrated and less subject-based; therefore, general teaching strategies are used to teach basic skills such as vocabulary and reading (Olson & Gee, 1991). As students become older, learning will become more specific, and more subject-based teaching strategies are considered suitable (Dickinson et al., 2019; Snyder & Golightly, 2017). Well-chosen strategies can improve students' academic and reading skills and also further their interest in reading (Wigfield et al., 2016).

Studies have shown that primary grade students' comprehension skills have been declining (Duke & Block, 2012; Spencer & Wagner, 2018). In a large-scale study conducted in the United States, it was established that more than half of fourth-grade students were failing to demonstrate mastery of fundamental reading skills (The Condition of Education, 2020). One possible reason for the decline in students' comprehension, might be teachers' teaching strategies (Ruotsalainen et al., 2020). Comparative studies of students' knowledge and skills have confirmed that Estonian teachers have been using advanced teaching strategies (Soodla et al., 2019; Uibu et al., 2010). According to recent research, almost all Estonian students were able to decode words upon entering school, while in first-grade classrooms teachers strongly emphasised students' text comprehension (Ruotsalainen

et al., 2020). Despite this, in a longitudinal study, it was found that Estonian students' comprehension proficiency diminishes over time (Soodla et al., 2019). Researchers have concluded that too much time spent on text comprehension activities was too demanding for some students and hindered their further development (Ruotsalainen et al., 2020; Torppa et al., 2019). Thus, more information is required on the effects of teachers' teaching strategies on students' text comprehension results so that a suitable strategy that meets students' changing needs in terms of text comprehension can be chosen.

Because reading skills are a prerequisite for a wide range of academic skills (Cunningham & Stanovich, 1997), it is critical to determine which factors are associated with reading development. It has been suggested that reading development includes both 'skill and will' where reading skills and motivational factors such as reading interest have an equally important role (Cambria & Guthrie, 2010; Gambrell, 2015; Watkins & Coffey, 2004). This means that supporting students' text comprehension and interest in reading should be practiced comprehensively. Studies have been conducted to determine the effects of teaching strategies on reading interest (Davis, 2010; Edmunds & Bauserman, 2006) and their influence on text comprehension (Guthrie et al., 2004; Klinger et al., 2010; Tang et al., 2017). The results suggest ways in which teachers can organise their teaching to develop competence and engagement in text comprehension among primary school students. However, there is still a lack of information on the extent to which teaching strategies affect primary school students' text comprehension and reading interest.

The substantial discussion to date has concerned the kind of knowledge and skills students should be taught in primary school native language lessons (Oakhill et al., 2019; OECD, 2019; Viljaranta et al., 2017). Less is known about the effects of teachers' teaching strategies on students' reading. To support students' text comprehension development and interest in reading, it is essential to understand how these skills relate to teachers' strategies. Accordingly, this doctoral thesis focuses on primary school teachers' teaching strategies in their Estonian native language lessons and how these strategies affect students' text comprehension, vocabulary, and reading interest.

1.2. Aim of the study and research questions

Text comprehension is fundamental for students to be academically successful, but students' comprehension skills could be better; therefore, these skills should be developed particularly thoroughly (Soodla et al., 2019). Text comprehension is bound up with interest in reading, and so supporting students' text comprehension and interest in reading through teaching strategies should be practiced comprehensively. The focus of this doctoral thesis is on students' age, gender, vocabulary, and reading interest, and on teachers' teaching strategies that affect primary school students' text comprehension. The aim of the doctoral thesis is to determine age and gender differences in text comprehension and the effects of

teaching strategies on primary school students' text comprehension, vocabulary, and reading interest.

To realise the aim of the study, the following four research questions were addressed:

RQ1: What are the differences in vocabulary and text comprehension in primary grades according to students' age and gender?

RQ2: Which general teaching strategies do teachers employ in their native language lessons?

RQ3: How do language teaching strategies directly impact students' text comprehension, vocabulary, and reading interest?

RQ4: What are the effects of language teaching strategies on students' vocabulary, text comprehension, and reading interest throughout primary school?

These research questions were addressed in four original publications.

Study I contributes to answering RQ1, studying the associations between primary school students' age, gender, vocabulary, and text comprehension (Article I).

Study II explored RQ2, investigating general teaching strategies that teachers use in their native language lessons. This study also investigated teachers with different profiles of teaching strategies (Article II).

Study III addresses RQ3 by examining the language teaching strategies that teachers use, as well as the impact of these strategies on their students' text comprehension, vocabulary, and reading interest in the 3rd grade (Article III).

Study IV addresses RQ4, by exploring the effects of teachers' language teaching strategies on their students' vocabulary, text comprehension, and reading interest throughout primary school (Article IV).

2. THEORETICAL FRAMEWORK

2.1. Text comprehension

Text comprehension is a complicated process that has been discussed in the following key ways. First, it is suggested that efficient decoding skills and vocabulary are part of text comprehension (Cain & Oakhill, 2011; Torppa et al., 2016); second, it is proposed that the exact relationship between vocabulary and text comprehension is not well understood (Pearson et al., 2007); third, it is claimed that the association of vocabulary to text comprehension is reciprocal, with vocabulary and text comprehension impacting each other (Nagy, 2005); and fourth, the most important outcome of reading is established to be gaining new knowledge through understanding the meaning of the text (Butcher & Kintsch, 2013; Oakhill et al., 2019). This chapter provides an examination of the research on text comprehension. In the first section, the concept of text comprehension is discussed. Further in this chapter, the focus will be on student-derived factors that affect text comprehension. The second section focuses on the role of vocabulary in text comprehension, while the third discusses students' age and gender differences in text comprehension.

2.1.1. The concept of text comprehension

Text comprehension is an activity that relies upon being able to access the meanings of words in context, understand grammar constructions, and draw inferences, analyse, and summarise content (Butcher & Kintsch, 2013; Cain & Oakhill, 2011; Oakhill et al., 2019). Without text comprehension, students will not understand how sentences are connected (Mason & Hagaman, 2012; Snow, 2002). In this thesis, text comprehension is defined as extracting the meaning of the text.

At the beginning of primary grades, decoding speed and accuracy together with the sense of the words are central. As students become older, they learn how to fill the gaps in their understanding using implicit information from within the text. Reading to understand cannot take place unless the words in the text are accurately and efficiently decoded (Cain & Oakhill, 2011). Although vocabulary is necessary for comprehension, students require more knowledge to understand the text. In addition to decoding words, text comprehension requires background knowledge to construct an approximate understanding of the written message. Word identification is a process that results in an exact match – to illustrate, a student either can or cannot read the word 'butterfly'. Understanding the whole text is often problematic for students because this process demands that they identify the main idea, which may be too abstract (Steiner & Magee, 2019). In complex reading tasks, the main idea often needs to be inferred and is not explicitly stated (Cain et al., 2001). Therefore, text with appropriate readability determines how easily students are able to comprehend it.

Text readability is defined as how easily the text can be read. This is dependent on word type, number, and length, and the difficulty level of each sentence. Moreover, the length of the sentences in the text and the level of sentence abstraction are also important. Readability plays a substantial role in different types of texts (Eason et al., 2012). Students may have different reading preferences regarding text type, and readability can vary based on reading purpose. For example, reading to learn something new or reading for fun serve very different purposes; thus, the corresponding texts may have slightly different levels of readability. In Estonian primary grade native language lessons, mainly fiction or informational texts are used. Fiction texts are easy to understand as they help students to learn about textual coherence, logic, analysis, parsing, and finding the main idea (Block & Pressley, 2002). Informational texts are more challenging for students because there are several nonfiction types (such as history texts, autobiographies, or instructional manuals) aimed at supporting students to find key information and understand the main topic.

2.1.2. The role of vocabulary in text comprehension

Vocabulary is generally defined as the knowledge of word meanings, and is a core component of language proficiency (Ehri, 1991). Vocabulary has two dimensions: breadth and depth. The breadth of vocabulary indicates the number of words students know, whereas the depth refers to the richness of vocabulary, or how well students know these words (that is, their meaning in different contexts). While both dimensions contribute to text comprehension, it was found that breadth had a stronger effect on text comprehension than the depth of vocabulary (Li & Kirby, 2015). On average, primary school students learn more than 3000–4000 words per year for languages with a deep (opaque) orthography such as English, while the number can be higher for a shallow orthography such as Estonian. Students may experience differing degrees of growth each year; for example, in one year they learn 3000 words, but then may learn 4000 words in the next year because they start reading more (Stahl & Nagy, 2006).

Word decoding refers to the process of translating print text into speech by matching a combination of letters (graphemes) to their sounds (phonemes) and recognising the patterns that make syllables and words (Beck & Juel, 1995). If a word is accurately decoded several times, it is likely to become recognised without conscious deliberation, and is then acquired into the learner's vocabulary. Without decoding skills, vocabulary will be limited, and reading might lack fluency. In addition to decoding skills, vocabulary is affected by its exposure frequency – that is, how often certain words are shown in a text (Kim, 2017). It is suggested that for optimal effectiveness, target words should be repeated eight times in a text, while others have suggested that six encounters are an adequate number (Rott, 1999; Waring & Takaki, 2003).

Vocabulary acquisition also varies by the type of word. Nouns with specific meanings (for example, *ball* or *umbrella*) are easily acquired because they can be

referred to directly. It is more difficult and time-consuming with nouns that have abstract meaning (such as *happiness* or *grief*) that relate to things that cannot be seen or touched directly (Hirsh-Pasek & Golinkoff, 2006). It is even more difficult to acquire verbs and other abstract words because students need to give meaning to a word by combining and expanding different contexts (Cruse, 2004). In addition, some words have several meanings (homonyms), which makes the process of understanding them even more complex. In such cases, the exact meaning only emerges from the context – to illustrate: The hiker had a *light* backpack with him, and the overhead *light* was left in the car. While assigning meanings to new words, students should understand how to use them in different contexts (Cervetti et al., 2012). Therefore, it is advisable that students should have multiple experiences with a new unknown word before it is embedded into their knowledge (Saxton, 2010). With regard to text comprehension, it is suggested by Nagy and Scott (2000) that approximately 90%–95% of the words in a text need to be understood in order to comprehend its meaning.

2.1.3. Age and gender differences in text comprehension

To understand words, sentences, and passages, students require different knowledge and cognitive processes according to their stage of development (Oakhill et al., 2015). At the beginning of primary grades, text comprehension is strongly related to phonological skills and word meaning. In the upper grades of primary school, text comprehension depends more on specific knowledge on how to obtain important information, and the ability to monitor comprehension and high quality orthographic, phonological, and lexical-semantic representations (Nouwens et al., 2018; Walpole et al., 2017). Older students rely on metalinguistic abilities (awareness that language has the potential to go beyond the literal meaning) to learn new words, being aware of syntax and morphology. They use more context and familiar word analysis to find meaning (Oakhill et al., 2015), and the development of text comprehension is supported by improved knowledge of how the sentences are formed (Walpole et al., 2017).

Age differences in text comprehension influence student inference-making (Freed & Cain, 2017), metacognitive skills (Mirandola et al., 2018), and comprehension monitoring. These refer to the ability to perceive the text as a whole, find contradictory information, and capture the meaning of the text (Oakhill et al., 2015). Younger students rely on specific questions to draw text-based conclusions and use less background knowledge (Eason et al., 2012). Text-based inferences improve as students get older (Oakhill et al., 2015). For example, older students have greater depth of vocabulary and are able to make connections between concepts in the text, which allows them to infer what is not explicitly stated (Cain & Oakhill, 2014). In addition, older students apply background knowledge more widely, and make text-based generalisations (Kibui, 2012). Clear structure within the text (such as the title and subheadings) supports their understanding of the text enabling them to draw conclusions (Oakhill et al.,

2015). Research has demonstrated that younger students lack accurate comprehension monitoring skills; therefore, they pay more attention to the specific activities described in the text rather than to the motives for the activities. Younger students link information within rather than between events and tend to overestimate their performance in reading (Schneider & Löffler, 2016). Students in different age groups have different levels of self-awareness, which can result in them overestimating their reading skills. This could have a negative effect on their reading results (Mirandola et al., 2018; Schneider & Löffler, 2016).

Research has confirmed that text comprehension and reading skills differ by gender (Klecker, 2006; Lynn & Mikk, 2009). Cognitive development typically occurs more rapidly for girls than for boys in the primary grades, which in turn influences rates of comprehension according to gender (Logan & Johnston, 2010; Prado & Plourde, 2011). According to Kaushanskaya et al. (2013), gender differences in word learning demonstrated that girls outperformed boys when learning phonologically-familiar novel words in association with familiar referents. These findings suggest that girls are more likely than boys to recruit native language phonological and semantic knowledge during novel word learning. Accordingly, girls typically outperform boys in most reading and literacy tasks at school (Logan & Johnson, 2010). Moreover, girls may be more likely to read for leisure and have a higher level of reading interest, consequently broadening their opportunity to develop general reading and comprehension skills (Lerkkanen et al., 2012b). Better results for girls might be due to their increased reading interest compared with boys (Fredricks & Eccles, 2002; Torppa et al., 2018). In a recent longitudinal study conducted among 5816 Norwegian primary school students, it was discovered that gender differences in reading and literacy at school entry does not directly lead to boys' long-term underachievement (McTigue et al., 2020). Thus, encouraging boys to engage in similar behaviours with consistent instruction will likely promote the cultivation of their thinking and analytical skills (Krathwohl, 2002).

2.2. Reading interest

Interest in reading is part of the concept of motivation. In general, two different kinds of motivation have been established: extrinsic and intrinsic motivation (Deci & Ryan, 1985). Extrinsic motivation is derived from external sources, such as wanting to achieve an 'A' in an exam or trying to make a teacher or parent feel proud (Becker et al., 2010). Intrinsic motivation is an innate desire to overcome certain challenges, such as reading an arduous text with no tangible motivation other than a desire to read (Deci & Ryan, 1985). Of the two kinds of motivation, intrinsic motivation is closely related to text comprehension (Becker et al., 2010), and consists of several subdivisions, such as interest, involvement, and preference (Taboada et al., 2009). In the context of learning, interest is one of the reasons why and how students perform tasks and exhibit a particular learning behaviour (Hidi & Renninger, 2006).

Interested students spend considerable time and effort reading, and this will in turn expand their vocabulary and promote text comprehension (Tang et al., 2017). Therefore, one possible explanation for the relationship between reading interest and text comprehension relates to the amount of text consumed. A recent study of primary school students showed that to succeed in text comprehension, learning the mechanical reading skills is not enough; students should also learn how to *love reading.* In other words, they should be interested in reading (Gentilini & Greer, 2020). A further study, among second- and third-grade students discovered that intrinsic reading motivation (including reading interest) contributes to students' development of reading competence. Intrinsically-motivated students read out of interest and enjoyment and because they find the process of reading rewarding in itself (Schiefele, Stutz, & Schaffner, 2016). Nevertheless, research has shown controversial results between students' interests and reading skills. For instance, Kikas and colleagues (2015) found that among Estonian primary school students, reading interest did not predict their reading results in the long term. Moreover, in another large-scale study of 1171 Norwegian primary school students, no direct link was found between students' reading interest and their reading skills (Walgermo et al., 2018).

A study by Lerkkanen et al. (2012b) of primary school students with lower reading skills showed a lack of interest in reading. Further, it was found that primary school students' reading interest decreased when students received insufficient individual attention from the teacher (Fredricks & Eccles, 2002). Reading interest arises through interaction in the classroom with age-appropriate texts and supportive reading instruction (Francois, 2016). Interest in reading has been reported to contribute to the amount of reading among fourth, fifth, and sixth graders (Baker & Wigfield, 1999), which in turn promotes students' reading performance (Cipielewski & Stanovich, 1992). Students with better text comprehension skills may select more difficult texts, which accelerates their reading progress (Guthrie et al., 1999). Thus, when students are interested in reading, they are more willing to exert effort on comprehension tasks in the face of more challenging material (Hidi, 2001).

2.3. Teaching strategies

The term teaching strategy encapsulates a pluralism of definitions and concepts. According to some authors, teaching strategies are defined as separate concrete teaching activities, such as discussions or brainstorming (Wehrli & Nyquist, 2003). Other researchers have found that strategies are considered approaches with specific actions or techniques (Cohen, 1996). In this thesis, the term teaching strategy is defined as a set of specific teaching activities that teachers use in classrooms to achieve their defined goals (Adom et al., 2016).

The first section of this chapter focuses on the general teaching strategies more often used in the Estonian first stage of primary school (from first to third grade: ages 7 to 10 years), where learning is more integrated and less subject-based. As

the students become older, there is a need for more specific teaching strategies (such as language teaching strategies in native-language lessons), because teaching becomes more subject oriented. Therefore, in the second section, subject-based teaching strategies are introduced, which are more prevalent in the second stage of primary school (from fourth to sixth grade: ages 11 to 13 years). In the third section of the chapter, the strategies for supporting students reading interest are discussed, because students' reading interest is closely related to text comprehension and academic achievement.

2.3.1. General teaching strategies

Teachers employ teaching strategies to achieve specific goals in the classroom (Vhurumuku & Chikochi, 2017). Teaching strategies – a specific approach to teaching – comprise a generalised plan that the teacher implements to ensure that the teaching activities or methods employed in the classroom are effective (Adom et al., 2016). General teaching strategies are related to theoretical concepts (Halliday, 1993) and different instructional approaches: traditional and constructivist (Brophy, 1999). The traditional approach is also defined as teacher-focused or content-centred, while the constructivist approach is known as learning-centred teaching (Kember & Kwan, 2000; Trigwell et al., 1994).

Content-centred teaching refers to the centrality of the teachers' direction using specific teaching materials (Kember & Kwan, 2000; Postareff & Lindblom-Ylänne, 2008). With this approach, teachers maintain control over both the classroom and instructional activities (Freiberg, 1999). Strategies supporting this approach are beneficial for every lesson; therefore, they are also beneficial for language learning, specifically because they facilitate the processes of expanding vocabulary and acquiring grammar rules (Trigwell et al., 1994). Content-centred teaching comprises activities such as lecturing, direct instruction, demonstration, and practice together with the provision of constant feedback on the students' results (Perry et al., 2007; Serin, 2018). Teachers who prefer content-centred teaching often use textbooks to guide instruction throughout the curriculum (Chen & Yu, 2019; Freiberg, 1999). In content-centred teaching, it is assumed that students can learn without taking an active role in the instructional process (Trigwell et al., 1994). Within a content-centred teaching context, students tend to spend more time listening, remembering, and following the teachers' instructions.

By contrast, learning-centred teaching focuses on students' active involvement in the classroom (Kember & Kwan, 2000). In this case, the teacher's role changes from that of content expert to facilitator of learning. For example, teachers employing this approach encourage students to initiate a discussion about certain topics or assist students on how to evaluate the meaning of the text by making judgments based on certain criteria (Harmin & Toth, 2006; Mostrom & Blumberg, 2012). With a learning-centred approach, teachers apply general teaching strategies that provoke students' active participation in knowledge-building, leading them to cultivate their thinking skills through intrinsic motivation (Weimer, 2012).

Students are engaged in the instructional process by participating in teaching activities, such as discussion, problem-solving, role-playing, games, and questioning (Brophy, 2006; Felder & Brent, 2009; Grunert, 1997; Konopka et al., 2015). When applying these activities in the classroom, it is necessary for students to receive feedback from teachers during teaching sessions so that they can improve their learning skills and achieve the goals of the specific lesson (Mostrom & Blumberg, 2012).

Instructional goals are focused on the development of students' analytical and problem-solving skills; however, it is difficult to realise these goals through content-oriented teaching (Darling-Hammond et al., 2020). Given that there is no teaching approach, strategy, or activity that covers all the necessary aspects of students' academic achievement (Cantor et al., 2018), teachers usually apply strategies from both content- and learning-centred approaches. Teachers should choose to teach in whichever way is appropriate for the aim of the lesson, taking into consideration their students' age, individual needs, and abilities (Perry et al., 2007; Rasku-Puttonen et al., 2011; Serin, 2018; The Estonian Lifelong Learning Strategy, 2020, 2014).

2.3.2. Language-teaching strategies

Formal language teaching focuses on teaching through grammatical units and lexical items (Richards & Rodgers, 2014). In this approach, teachers value the acquisition of vocabulary and grammar rules (Kim, 2008). Contrary to formal language teaching, the communicative teaching approach stresses that language itself cannot solely be explained in terms of grammar and syntax; instead, the day-to-day use of language is principal (Halliday, 1975; Richards & Rodgers, 2014). Based on both formal language and communicative teaching, an effective combination was formed as balanced reading instruction (Pressley, 1998; Snyder & Golightly, 2017). This approach supports the acquisition of vocabulary and grammatical constructions as well as text comprehension (Snyder & Golightly, 2017). The third approach is generally considered the most effective. In this thesis, the language teaching strategies derived from balanced reading instruction are of central focus.

Developing vocabulary effectively in primary grades is achieved through a step-by-step process that begins by teaching students to decode and recognise new words using visual materials, then moving on to the parsing step with additional information provided through short stories. Finally, the practicing step is introduced, at which point students are taught to use their newly acquired words in different contexts (Cruse, 2004). There are several predominant activities used to teach vocabulary, including the explanation of words with synonyms (Marzano, 2004), puzzles, and word games (Foorman et al., 2006), and having students use the dictionary to find unknown words. It has been shown that students' vocabulary will expand after encountering new words in various contextual settings (Rupley et al., 1999).

Because teaching vocabulary alone is not sufficient to facilitate the development of text comprehension skills, teachers should also instruct students on grammatical constructions. Without sufficient knowledge of grammar, students will inevitably struggle to make logical sense of a text (Hillocks & Smith, 1991; Silva & Cain, 2015; Thornbury, 1999). Grammar is defined as a language system consisting of morphology, syntax, and semantics (Gleason & Ratner, 2009). For grammar instruction to be worthwhile for students, teachers should make strategic decisions on how they can most effectively teach it; this is because students have difficulty understanding abstract words or sentences.

According to Lefstein (2009), there are two instructional strategies that dominate contemporary teaching on how to teach grammar in language lessons. First, with traditional teaching, rule-based grammar teaching divides language into two categories: correct and incorrect. Rule-based grammar teaching is appropriate for younger students, as teaching activities such as crossword puzzles, grammar games, and worksheets can be used for sorting verbs, adverbs, and adjectives (Foorman et al., 2006; Sekelj & Rigo, 2011). Second, a more recent language teaching strategy – rhetorical grammar teaching – treats grammatical conventions as choices rather than rules to be followed. In this case, students need to engage in a kind of an internal discussion about sentence rhythm, cohesion, subordination, coordination, punctuation, modification, and diction (Kolln & Gray, 2017). An example of rhetorical grammar teaching is a discourse on the connection between writing and thinking; in other words, the relationship between *what* (the meaning) is said within a sentence and *how* (for example, active or passive verb constructions) it is said (Micciche, 2004). Rhetorical grammar teaching emphasises the articulation and expression of relationships between ideas (Micciche, 2004). Therefore, students need to be familiar with basic grammar principles in order to acquire a rhetorical understanding of the grammar (Lefstein, 2009).

At the beginning of primary school, the focus of native-language teaching is on the development of students' knowledge of vocabulary and grammar, and on cultivating their basic reading skills and comprehension. Teaching text comprehension requires the use of various activities. For example, students may be asked constructive questions to facilitate their understanding of the text's main idea, such as *What? Why? When? Where? How?* (Bowyer-Crane et al., 2017). These kinds of open questions not only promote finding the main idea, but also create a basis for sustained and constructive discussion about the text or topic. Other activities, such as rewriting and retelling the text, headlining, or dividing the text into parts, further promote text comprehension (Duke & Pearson, 2002). For example, when students are asked to retell the text, the activity could be fruitless unless students are taught *how* to do it. After reading the text, students need to determine the key terms within the text; they should make inferences about the text and synthesise the main idea before they are able to retell it correctly.

2.3.3. Strategies to support reading interest

Teaching strategies that support students' interest in reading are characterised by a learning-centred teaching approach based on constructivist theory (Stipek & Byler, 2004). Such an approach has been found to result in greater interest and self-efficacy related to reading when compared to content-centred teaching in primary school (Lerkkanen et al., 2012a; Stipek et al., 1995). The core principles of learning-centred teaching align with the promotion of students' basic psychological needs. These incorporate students' interests, facilitate supportive relationships amongst teachers and students, and ensure appropriate challenges and constructive feedback (Lerkkanen et al., 2012a; Pitzer & Skinner, 2017). When teachers are responsive to students' needs and take their interests into account in the classroom, they foster students' motivation to learn, thereby resulting in better learning outcomes (Lerkkanen et al., 2016).

To support reading interest, teachers should provide students with opportunities to make choices about what to read (for example, students should be allowed to choose topics in which they have an interested) and teachers should also guarantee the availability of interesting texts (Guthrie & Klauda, 2014). Encouraging students to take an interest in what their peers are reading is another way of supporting their reading interest (Niemiec & Ryan, 2009). For example, implementing story (re)telling whereby teachers encourage discussion about a topic should also be employed (Guthrie & Klauda, 2014). Approaches to teaching that support reading interest include showing students how to use hands-on materials; engaging in occasional informal conversations with students; and applying dramatic role-play in the lesson (Stipek & Byler, 2004). Teachers can foster motivation by providing appropriate levels of challenge, making expectations known, acknowledging students' accomplishments, and offering supportive feedback. For example, teachers may ask questions that encourage students to give more than one right answer (when applicable). Thus, teachers who stress understanding are more likely to engage students in open-ended conversations about the text (Stipek & Byler, 2004).

Teachers support students reading interest using a teaching strategy that involves challenging tasks at the level where students feel their learning has been effective (Niemiec & Ryan, 2009). If primary school students do not consider themselves competent readers, then their motivation (and, concomitantly, their reading interests) may diminish over their school years (Edmunds & Bauserman, 2006; Wigfield & Tonks, 2004). In addition, if students lack motivation, their participation in instructional activities may decrease (McRae & Guthrie, 2009). Turner and Patrick (2004) stated that students would be most willing to participate in classrooms where teachers express enthusiasm about learning, communicate a belief that all students can learn, and provide academic and emotional support, such as positive feedback and viewing mistakes as learning experiences.

2.4. Effects of teaching strategies on vocabulary, text comprehension, and reading interest

Studies have demonstrated that using certain teaching activities under the strategy of developing vocabulary is effective for students' vocabulary results (Biemiller & Boote, 2006; Elleman et al., 2009; Ford-Connors & Paratore, 2015). Among fourth grade students, vocabulary teaching was effective when teachers developed an understanding of a word's broad range of semantic connections and related concepts by providing exposure to several target words in multiple contexts (McKeown et al., 1983). The follow-up of these previous findings some 30 years' later confirmed that vocabulary teaching and vocabulary learning in third, fourth, and fifth grade classrooms were positively affected when teaching strategies included activities such as attention to explicit definitions, word relations, morphology, and syntax (Silverman et al., 2013). The creative, multifaceted teaching of new words helps to entrench these new words in the memory. When first grade teachers used repetition to help students derive the meanings of new words, students' performance improved by 12% before the end of the school year. When teachers used repetition and explanation together, the results improved by 22%. It was identified that placing vocabulary in varying contexts and learning new words via classroom discussions and conversations were effective ways to expand students' vocabulary (Ford-Connors, & Paratore, 2015). Nevertheless, discussion-based vocabulary teaching is uncommon in primary grades and rarely used in the classroom although it should be practiced more often (Scott et al., 2003).

The way teachers develop students' vocabulary can affect primary school students' text comprehension (Francis et al., 2006). In a long-term instructional experiment, fourth-grade students were provided explicit vocabulary teaching that predominantly utilised the activity of word definition. The results revealed that this strategy was positively and significantly associated with students' vocabulary skills and text comprehension (Beck et al., 1982). In another study, a meta-analysis of 52 studies on teaching vocabulary revealed that the teachers' approach improved the students' text comprehension, especially in those parts of the text that contained the previously taught words (effect size = .97). As anticipated, a smaller impact (effect size = .30) was found for the parts of text that did not contain previously taught words (Stahl & Fairbanks, 1986). In another meta-analysis of 37 studies, a strong effect of teaching vocabulary on primary school students' text comprehension (effect size = .50) was revealed.

The effects of various teaching strategies on first to fifth grade students' text comprehension were previously investigated with the results demonstrating that teachers who employed strategies prompting the analysis and synthesis of skills (for example, high-level questioning, summarising the content, or simply actively involving students) had the most positive influence on students' text comprehension. However, drilling and routine practice (like mechanical rehearsing and repeated reading) were not found to be of great benefit for promoting text

comprehension, and the more time spent on rehearsal, the slower the development of students' text comprehension (Taylor et al., 2002). It was also found that playful and engaging teaching strategies resulted in improvements in first and second grade students' vocabulary and text comprehension. Notably, the teaching strategy that positively affected students' vocabulary did not contain any explicit grammar teaching or mechanical drilling (Foorman et al., 2006).

Motivation (and reading interest) may decline over the school years if students do not consider themselves competent readers (Guthrie et al., 2007). Constructive feedback and acknowledging students' accomplishments will have a positive effect on their motivation as well as their interest (Edmunds & Bauserman, 2006). Primary school students' reading interest was shown to benefit when teachers valued the interests of the students, implemented intriguing activities, and offered them emotional support (Lerkkanen et al., 2012b). It was also found that primary school students' reading interest declined when too many teacher-directed strategies were applied (Fredricks & Eccles, 2002). Over-repeating new vocabulary and re-telling the content of the text in language lessons also have a negative effect on students' reading interest (Sekelj & Rigo 2011).

3. METHOD

3.1. Research design

Quantitative research methods were the sole method of data collection and analysis utilised for the studies. Both variable-oriented and person-oriented approaches to data analysis were used (Bergman & Wångby, 2014). Variable-oriented analyses facilitate comparisons at the group level (Muijs, 2004), while person-oriented analyses contribute to the identification of possible subgroups within the larger group (Bergman et al., 2003). In this thesis, cross-sectional and longitudinal studies are presented.

Cross-sectional research design principles were followed where the data was collected at one-time point and multiple outcomes were researched concurrently (Lee, 1994). A questionnaire was administered to teachers to investigate which general teaching strategies are employed in native language lessons (Study II). Questionnaire surveys offer an efficient method of collecting data from a large number of respondents (Akinci & Saunders, 2015). The cross-sectional design was also used in Study III, in which the impact of language teaching strategies on students' text comprehension, vocabulary, and reading interest was studied.

A longitudinal design was also utilised that included the continuous or repeated measures needed to analyse a sample. This also enabled investigation into the long-term effects and differences that no other study design could determine (Caruana et al., 2015). With this method, cause-and-effect relationships and connections became clearer. A longitudinal design was used in Studies I and IV. Study I investigated the differences in students' age and gender in text comprehension and vocabulary in primary grades. The direct and indirect effects of language teaching strategies on students' vocabulary, text comprehension, and reading interest throughout primary school were investigated in Study IV. A detailed overview of the research design and methodology with respect to the research questions is provided in Table 1.

Table 1. Methodology of the Studies

Study	Research question	Articles	Design and data collection timeline	Samples	Instruments	Data Analyses
Study I	**RQ1:** What are the differences in vocabulary and text comprehension in primary grades according to students' age and gender?	Article I	Longitudinal study (2007–2009)	508 students (Grades 3–5)	Reading test	Repeated Measures Analysis of Variance (ANOVA) One-way ANOVA Pearson's correlation analysis
Study II	**RQ2:** Which general teaching strategies do teachers employ in their native language lessons?	Article II	Cross-sectional study (2014)	186 teachers	General Teaching Strategies questionnaire	Exploratory factor analysis (EFA) Kruskal-Wallis test Friedman test Cluster analysis Chi-square test
Study III	**RQ3:** How do language teaching strategies directly impact students' text comprehension, vocabulary, and reading interest?	Article III	Cross-sectional study (2016)	18 teachers 220 students (Grade 3)	Language Teaching Strategies questionnaire Reading test Reading interest questionnaire	Path analysis
Study III	**RQ4:** What are the effects of language teaching strategies on students' vocabulary, text comprehension, and reading interest throughout primary school?	Article IV	Longitudinal study (2014 and 2016)	18 teachers 220 students (Grades 1–3)	General Teaching Strategies questionnaire Language Teaching Strategies questionnaire Reading test Reading interest questionnaire	Structural equation model (SEM)

3.2. Participants

To determine age and gender differences in text comprehension and the effects of teaching strategies on primary school students' text comprehension, vocabulary, and reading interest, primary school students and teachers were studied. All participants were in Estonian primary school regular classes and taught according to the Estonian National Curriculum for Basic Schools (Vabariigi Valitsus, 2011/2014). Students were investigated in Study I, and teachers in Study II. Both students and teachers were studied together in Studies III and IV.

3.2.1. Students

Participants in Studies I, III, and IV were students. In Study I students' age and gender differences in vocabulary and text comprehension were investigated. Study I included 508 Estonian primary school students who participated in three consecutive years, from third to fifth grade (ages 9 to 11). Study III focused on teachers' language teaching strategies and to what extent they impacted on third grade students' ($N = 220$) text comprehension, vocabulary, and reading interest. Study IV investigated longitudinally how teachers' language teaching strategies directly and indirectly affected their students' vocabulary, text comprehension, and reading interest. The sample in Study IV consisted of first grade students ($N = 220$) and the same students in the third grade.

3.2.2. Teachers

Participants in Studies II, III, and IV included teachers who taught the native Estonian language in primary school. All the participating teachers taught the students who were investigated in the same study. In Study II, the teachers' general teaching strategies were studied in native language lessons. The sample consisted of 186 Estonian primary school teachers (first to sixth grade). Teachers' average age was 45.14 years ($SD = 10.74$), and their teaching experience ranged from 1 to 47 years. In Study III, the impact of language teaching strategies on students' text comprehension, vocabulary and reading interest was studied. The sample consisted of 18 primary school third-grade teachers.[1] The teachers' average age was 46.92 years ($SD = 10.06$). Their teaching experience ranged from 2 to 41 years. In Study IV, the effects of language teaching strategies on students' vocabulary, text comprehension, and reading interest throughout primary school were studied. The teachers' sample consisted of 18 teachers who had taught the students in the first three grades. The teachers average age was 43.42 ($SD = 9.76$) when they taught first grade students and their teaching experience ranged from 1 to 39 years.

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[1] The published article has an error; while it says 12 teachers, the analyses were in fact performed with 18 teachers.

3.3. Instruments

Two types of instruments were used in the research for thesis. First, reading tests were applied to measure students' text comprehension and vocabulary skills. All reading tests included fictional reading text, vocabulary, and text comprehension tasks. Only words from the 10,000 most frequently used words in the Estonian written language (Kaalep & Muischnek, 2002) and those words used in primary school textbooks (Kitsnik & Metslang, 2011) were used to develop the vocabulary tasks (Study I, III, and IV). Second, questionnaires were developed to measure students' reading interest and teachers' frequency of usage of teaching strategies in native language lessons. To determine the factor structure of the questionnaires, exploratory factor analysis (EFA) was used for the instruments in Studies II and IV. All items with factor loadings below .40 were excluded from further analysis as recommended by Field (2009). The requirements of the Estonian National Curriculum for Basic Schools were taken into account during the development of all the instruments (Vabariigi Valitsus, 2011/2014).

3.3.1. Student instruments

3.3.1.1. Reading tests

Students' reading tests were used in Studies I, III, and IV. To measure age and gender differences in text comprehension and vocabulary, a reading test was compiled (Study I). The test was based on a revised version of Bloom's hierarchical taxonomy (Krathwohl, 2002) and national level Estonian language standard-determining tests (Uibu et al., 2010; Uibu & Tropp, 2013). In the third grade, students were required to read a simple text, while in the fourth and fifth grades they read a more complicated one. Three types of tasks were used: a lower-level and a higher-level text comprehension task, and a vocabulary task. In the lower-level text comprehension task, information finding and recognition skills were measured. By relying on the texts, students had to decide whether the sentences given in the task were correct. In the higher-level text comprehension task, the ability to integrate contextual information from the text was measured. Students were required to combine sentences that belonged together by their meaning and answer multiple choice questions. For example, in the fourth and fifth grades, the sentence provided was: *The fish was brought to trial because…* (a) *it wanted to die in peace*; (b) *it did not let others live in peace*; (c) *the fish bribed a fox* (in the text: *payoff*). In the vocabulary task, after reading the text, students were required to find the correct synonyms from a list of words. The students' scores in the reading test were calculated as the number of correct answers. In the third and fourth grades, students' scores for the lower-level text comprehension task were max = 8 and for the higher-level text comprehension task max = 6. The scores in the fifth grade tasks were max = 11 and 7, respectively for the lower-level and higher-level text comprehension task. In the third grade, the vocabulary task

consisted of three words, in the fourth grade six words, and in the fifth grade there were 10 words. During the three school years, some of the words were used repeatedly in all the vocabulary tests.

New tests to measure third grade students' text comprehension and vocabulary knowledge were composed for the cross-sectional study (Study III). The same tests were used in the longitudinal study together with tests for the first-grade students (Study IV). The results of earlier studies (Cambria & Guthrie, 2010; Wang & Guthrie, 2004) were used to develop the reading tests. In the first grade text comprehension task, after reading the fictional text, students had to choose the right answer (n = 9) from a multiple-choice list (for example, *Girls want to play with* … (a) bricks, (b) boys, (c) dolls [in text: *dolls*]). The third grade test included text comprehension tasks. The first task required the arrangement of sentences in accordance with the text. The second required students to identify the main idea of the text. They were given three sentences from each passage from which they had to decide the sentence that most accurately expressed the main idea of the passage. Third, the students were required to match questions and answers to the paragraphs they had read. In the fourth task, students had to summarise the text by finding the correct sentence from the given samples. The last task was focused on assessment skills, and consisted of multiple-choice questions focused on evaluating the text. The students' scores in the text comprehension tasks were calculated as the number of correct answers (max = 19). In Study IV, the one-factorial EFA for first- and third-grade text comprehension tasks were conducted with a fixed loading of items in one factor. The number of items was decreased, and the final solution was four items for the first grade and 12 items for the third grade. Examples of the third grade students' text comprehension tasks are provided in Appendix 1.

To measure students' vocabulary in the first and third grades, the words from the reading text were used. In the vocabulary task, students had to connect words from two columns, where the first column contained words from the text (five items in first grade and nine items in third grade). The second column featured synonyms of these words in random order (eight items in first grade and 27 items in third grade). In Study III, the scores from the third grade vocabulary task were calculated as the number of correct answers (max = 9). In Study IV, the one-factorial model for vocabulary tasks was conducted using EFA. The solution for the first grade vocabulary task was four items, and for the third grade vocabulary task it was eight items. Examples of the first and third grade students' vocabulary tasks can be found in Appendix 2.

3.3.1.2. Reading interest questionnaire

The reading interest questionnaires for first and third grades were developed using background questions from a PISA survey (OECD, 2016); for example, relating to reading for fun and reading for a certain amount of time per day. Students were asked to rate their agreement with statements about interest in reading on a 3-point

scale: 1 = *I do not agree*, 2 = *I partially agree,* and 3 = *I agree*. The reading interest questionnaire for first grade measured reading interest generally and included six items (Study IV). The instrument for third grade was more comprehensive and included 21 items. In third grade, the reading interest questionnaire was the same as in Studies III and IV. Using the EFA in Study IV, the final questionnaire in first grade included five items. In third grade the EFA divided the questionnaire into two factors: reading interest (seven items) and interest in vocabulary (five items). Examples of similar items in the questionnaires are provided in Appendix 3.

3.3.2. Teacher instruments

To measure the frequency of use of general teaching strategies by primary school teachers in native language lessons, two questionnaires were developed and designed following the examples of earlier studies (Marzano, 2004; Sekelj & Rigo, 2011; Silva & Cain, 2015). At the beginning of primary school, learning is integrated and less subject-based, therefore the *General Teaching Strategies Questionnaire* (GTSQ) was applied (Study II and IV). Due to the specificity of the primary school teachers' work, it is important to use general teaching strategies as well as language teaching strategies in native language lessons; thus, the *Language Teaching Strategies Questionnaire* (LTSQ) was applied. The LTSQ was used in Studies III and IV. In both questionnaires, teachers marked the frequency with which they used the described activities in native language lessons. The instructions in all questionnaires for each item read as follows: '*In language lessons, I use...*', which was followed by a list of teaching activities. The scores for teachers' answers to all the questionnaires were calculated as mean results for the 6-point Likert scale.

Next, EFA was conducted for the first grade teachers' GTSQ. The questionnaire included 17 items in total. The GTSQ score was calculated for each teacher as the mean of item scores. The items in the GTSQ are presented in Appendix 4.

The LTSQ was developed to assess the frequency of use of teachers' strategies to support students' text comprehension, acquisition of vocabulary, and development of reading interest. For third grade teachers, the LTSQ was used. In Study III, four parts of the questionnaire were implemented: developing reading interest, developing vocabulary, teaching text comprehension, and teaching grammar rules. In Study IV, EFA was conducted for the third grade teachers' questionnaire (21 items) and the factor solution included three scales: developing students' vocabulary, text comprehension, and reading interest. The LTSQ strategies scores were calculated for each teacher as the means of item scores. Examples of the items in the questionnaire can be found in Appendix 5.

3.4. Validity and reliability of the instruments

Several criteria were applied to confirm the validity and reliability of the instruments. To ensure construct validity, the subject-related theoretical materials and previous empirical studies were considered to formulate the items used in the reading tests and questionnaires (Sullivan, 2011). Expert groups and in-service teachers were involved to ensure the content validity of the instruments. All the instruments for students and teachers were piloted. The reading tests for third to fifth grades were piloted in two schools (Study I) to assess the appropriateness of every item. The reading tests and reading interest questionnaires for third grade students were piloted with 58 students (Studies III and IV) and with 48 students for first grade students (Study IV). The GTSQ was piloted with four first-grade teachers (Studies II and IV). The LTSQ was piloted with four third grade teachers (Studies III and IV). After piloting all the questionnaires, minor changes were made to the content of all the instruments and to the wording of the instructions.

To establish the reliability of the reading tests, internal consistency was calculated. For the third, fourth, and fifth grade students' lower- and higher-level text comprehension tasks and for the vocabulary task in the same grades, the Cronbach's alpha ranged from .62 to .93 (Study I). For the sample of Studies III and IV, the reliability of text comprehension and vocabulary tasks ranged from .59 to .82. For the third grade reading interest questionnaire, Cronbach's alpha was .88 Study III). The reading interest questionnaire for first grade was used to measure students' reading interest and the Cronbach's alpha was = .63, while for the third grade the reading interest and vocabulary interest questionnaires, Cronbach's alpha was .80 and .72, respectively (Study IV).

For the teachers' questionnaire, the internal consistency of the strategies ranged from .71 to .81 for the GTSQ (Study II) and from .63 to .77 for the LTSQ (Study III). The Cronbach's alpha of the GTSQ for first grade teachers was .74 and for third grade teachers' LTSQ three scales – developing students' vocabulary, text comprehension, and reading interest – ranged from .56 to .81 (Study IV).

3.5. Data collection

3.5.1. Students

In Studies I, III, and IV in which the students' participated, informed consent was provided by the parents of the students. The consent documents, reading tests, and questionnaires for the students were taken to the schools by the author in sealed envelopes. The students completed the reading test and reading interest questionnaires during one language lesson (approximately 45 minutes) under teacher supervision. The reading text was in front of the students throughout the whole test. Students were not allowed to talk to each other during the test.

3.5.2. Teachers

For Studies II, III, and IV, the data was gathered from the teachers. In studies III and IV, the same samples of teachers were used. School principals and teachers provided approval to conduct the study in two data collection phases. The author of this thesis conducted the data collection. The teaching strategy questionnaires (including written instructions) were either hand-delivered to the schools or sent by post. Teachers completed the questionnaires in approximately 15 minutes, and the response rate was 100% ($N = 186$ for Study II; $N = 18$ for Studies III and IV).

3.6. Ethical standards

In all of the studies conducted for this thesis, participants were informed about how their data would be collected, presented, and preserved following the principles of ethics (Eesti Teaduste Akadeemia, 2002; Hammersley & Traianou, 2012). Students and teachers were told that their involvement in the study would be voluntary and they were given detailed explanations about the structure and content of the research. School principals and teachers gave their verbal agreement for the study to be conducted. As the children were primary school students, their parents were approached and given an explanation in writing about the procedure of the study. Consent from parents and teachers to attend was obtained (except for some students, whose parents did not allow them to participate). During data collection, the procedure was explained again in writing to the participating teachers and verbally to the students. Students and teachers were fully informed about the nature of the research and about the right to withdraw from the study for any (or no) reason and at any time.

To ensure the anonymity of the participants, all the completed tests and questionnaires were transported in sealed envelopes. The data and material collected during the studies was anonymised to ensure that no personal data will be revealed when the results of the study are published (and is in the sole possession of the author). All analysed data were coded, and the collected material will be safely stored until all the articles have been published. It is important that all participants are aware of the aims and procedure of the research and understand that their confidentiality will be protected at all times, as recommended by BERA (2011) and Kline (1995).

3.7. Data analysis

3.7.1. Study I

First, to find the differences in students' vocabulary and text comprehension results in primary grades, the repeated-measures ANOVA (using SPSS Statistics 20.0) was implemented. Second, to identify the groups that differed in terms of vocabulary and text comprehension, post hoc comparisons with a Bonferroni correction were conducted. Third, to examine the differences between students' gender and to detect differences in text comprehension over three consecutive years, a one-way ANOVA was applied. To present the statistical significance between groups, in addition to the p-value, the effect size (η^2) was used (Cohen et al., 2007). Fourth, to reveal the relationship between students' vocabulary and text comprehension, Pearson's correlation analysis was utilised. With respect to the longitudinal design, it was necessary to include only those students who completed the whole test at all the time points.

3.7.2. Study II

In this study, EFA was implemented to answer the second research question: *Which general teaching strategies do teachers employ in their native language lessons?* The EFA was conducted with the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and the Bartlett test of sphericity, as well as with the Oblimin method and rotated factor loadings. Using the Oblimin method, it was assumed that the factors are correlated. To investigate whether the use of teaching strategies differed among first and second school stage teachers, a Kruskal-Wallis test was conducted. To compare teaching preferences separately in school stages, a Friedman test was implemented. For post hoc comparisons, a Wilcoxon signed-rank test was used.

The Sleipner (version 2.1) with the cluster (Ward's method) module was implemented to identify possible teaching strategy profiles that would reflect the patterns of use for different teaching strategies. The criteria for suitable cluster solutions were as follows: (a) theoretical meaningfulness of a solution; (b) a sudden drop in the explained error sum of squares (EESS) of the solution; (c) the coefficient for the homogeneity of the clusters (Bergman et al., 2003; Bergman & Wångby, 2014). Differences in teachers' preferences of profiles across school levels were analysed using the chi-square test.

3.7.3. Study III

Path analysis was used to determine how teachers' language teaching strategies impact on students' text comprehension, vocabulary, and reading interest. A hypothesised model, illustrated in Figure 1, was formed using SPSS 22.0, AMOS.
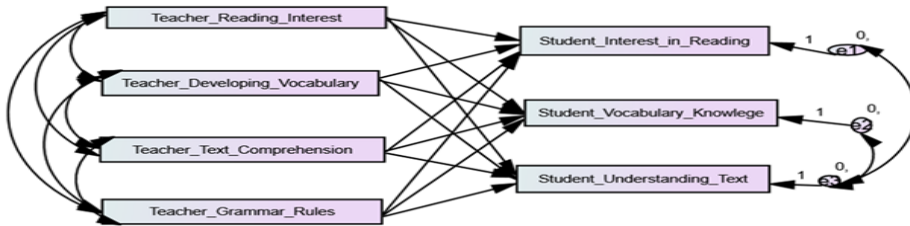

Figure 1. Hypothesised model of the impact of language teaching strategies on students' reading outcomes and reading interest (from Article III).

The final model was expected to have acceptable measures of goodness-of-fit on which to base conclusions about impact. Fit indices as the comparative fit index (CFI) and the incremental fit index (IFI) were considered while accepting model fit (Byrne, 2001). Furthermore, the chi-square goodness-of-fit measure and the root mean square error of approximation (RMSEA) were considered (Hu & Bentler, 1999).

3.7.4. Study IV

This study examined the effects that language teaching strategies have on students' vocabulary, text comprehension, and reading interest throughout primary school. The phenomena underlying the measured variables in the students' instruments (reading tests and reading interest questionnaires) and in the teachers' question-naire was identified by creating one or two factorial models using EFA. Pearson correlation analysis was used to find statistically significant associations between the teachers' teaching strategies and their students' aggregated results at the class level for text comprehension, vocabulary, and reading interest.

The direct effects on first grade students' text comprehension, vocabulary, and reading interest and the direct and indirect effects of teachers' teaching strategies on third grade students' text comprehension, vocabulary, and reading interest was investigated by creating the hypothesised mediated structural equation model (SEM) (see Figure 2). The mediation model was developed with SPSS AMOS (version 26) and was expected to have eligible measures of goodness-of-fit on which to base conclusions about the effects. Fit indices as a CFI, Tucker-Lewis index (TLI), IFI, and the RMSEA indicated a good fit and were considered while accepting the model (Hu & Bentler, 1999).

GRADE 1: TEACHERS GRADE 1: STUDENTS GRADE 3: STUDENTS
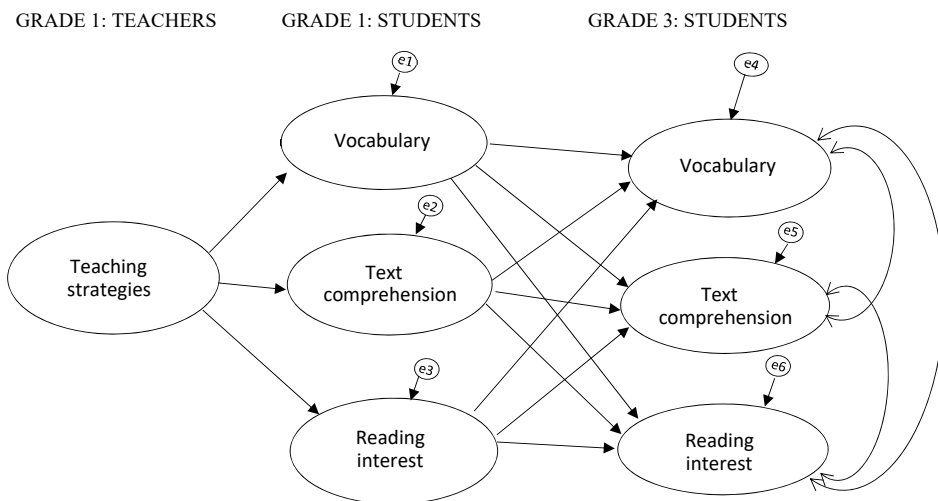
Figure 2. Hypothesised mediation model (from Article IV).

Note: The figure presents the effects between the latent constructs (to make the figure easily readable). The effect sizes have been calculated between the individual characteristics in the model.

In the hypothesised mediation model, teachers' teaching strategies describing several activities for promoting students' vocabulary, text comprehension, and reading interest were combined into one latent factor. According to the hypothesised model, teaching strategies affect third grade students' vocabulary, text comprehension, and reading interest through their first grade results. In addition to teaching strategies, students' vocabulary, text comprehension, and reading interest results may be influenced by other factors, as well as by potential measurement errors, which are designated by the letter 'e' in the model.

4. FINDINGS

The results of the research are presented in four sections in accordance with the research questions. First, the thesis focuses on students' age and gender differences in vocabulary and text comprehension in primary grades. Second, it presents an overview of the general teaching strategies that Estonian primary school teachers employ in their native language lessons. Third, an investigation of how the teachers' language teaching strategies impact on their students' text comprehension, vocabulary, and reading interest is presented. Fourth, the effects of language teaching strategies on students' vocabulary, text comprehension, and reading interest throughout primary school are considered. An overview of the most important results of the research based on the research questions is presented in Table 2.

Table 2. Overview of the main results in all four studies.

Research questions	Data analyses	Main results
RQ1: What are the differences in vocabulary and text comprehension in primary grades according to students' age and gender?	Repeated Measures Analysis of variance (ANOVA) One-way ANOVA Pearson's correlation analysis	(1) The students had the highest vocabulary results in the fourth grade and the lowest in the fifth grade. (2) Girls performed better than boys in vocabulary and text comprehension. (3) Students' high comprehension in the third grade was associated with their vocabulary results in the fourth grade.
RQ2: Which general teaching strategies do teachers employ in their native language lessons?	Exploratory factor analysis (EFA) Kruskal-Wallis test Friedman test Cluster analysis Chi-square test	(1) Teachers used three strategies: supporting active learning, teaching text comprehension, and teaching grammar. (2) Supporting active learning was the most frequently used strategy among teachers of the first school stage. (3) Teaching grammar was the most frequently used strategy among the teachers in the second school stage. (4) Six groups of teachers with different teaching profiles were chosen, four of which tended towards specific profiles and two towards mixed teaching profiles.
RQ3: How do language teaching strategies directly impact students' text comprehension, vocabulary, and reading interest?	Path analysis	**Frequent use of the…** (1) reading interest strategy had a positive impact on students' vocabulary, text comprehension, and reading interest. (2) vocabulary development strategy had a positive impact on students' vocabulary. (3) teaching text comprehension had a negative impact on students' text comprehension, vocabulary and reading interest. (4) teaching grammar strategy had a negative impact on students' reading interest and text comprehension.

Research questions	Data analyses	Main results
RQ4: What are the effects of language teaching strategies on students' vocabulary, text comprehension, and reading interest throughout primary school?	Structural equation model (SEM)	**The continual application of the …** (1) reading interest strategy had a positive effect on students' vocabulary, text comprehension and reading interest in the third grade. (2) developing vocabulary strategy had a positive direct effect on students' vocabulary in third grade. (3) text comprehension strategy had a negative effect on students' vocabulary, text comprehension and reading interest in the third grade. (4) developing vocabulary, teaching text comprehension, and supporting reading interest in first grade had a positive indirect effect on third grade students' vocabulary, text comprehension, and reading interest.

4.1 Development of text comprehension and vocabulary based on students' age and gender

In this study, longitudinal differences among primary school students' vocabulary and text comprehension were investigated. Differences in students' vocabulary knowledge were examined by implementing a repeated measure ANOVA. This revealed that the time factor was the main reason for differences in solving the vocabulary task. There was a statistically significant difference between the students' results across all three years, with fourth-grade students having the highest vocabulary results and fifth-grade students the lowest.

Next, differences were identified between boys and girls in terms of previously learned words and text comprehension over the three consecutive years. Analysis using a one-way ANOVA demonstrated that girls outperformed boys in vocabulary in both the fourth and fifth grades. However, there were no gender differences between the results in the third grade. To assess the differences between boys and girls in lower- and higher-level text comprehension, two reading tasks at different cognitive levels were used. In the lower-level text comprehension task, girls attained better results than boys in both the fourth and fifth grades. In the higher-level text comprehension task, and the overall reading test girls outperformed boys over the three consecutive years.

The association between students' vocabulary and text comprehension was studied. Statistically significant associations emerged between the text comprehension and vocabulary tasks of all three years, especially the fourth and fifth grade students' vocabulary results ($r = 0.48$). The analysis demonstrated that students who had better vocabulary results in the fourth grade also had better vocabulary and text comprehension results in the fifth grade. Significant correlations were found between fourth-grade vocabulary and third-grade text comprehension tasks. Therefore, students who managed better with more complex text comprehension tasks in the third grade demonstrated better vocabulary knowledge in the following year. There was a significant association between students' results in vocabulary and text comprehension in the fourth grade. In addition, students who achieved better results in both text comprehension tasks in the fourth grade demonstrated better vocabulary knowledge in the fifth grade.

Significant associations were found between the lower- and higher-level text comprehension tasks in different years. Students who achieved better results in higher-level text comprehension tasks in the third grade performed successfully with the same type of tasks in both the fourth and fifth grades. Analysis of the text comprehension tasks in separate years indicated that students' in the fourth and fifth grades who achieved good results in higher-level text comprehension tasks had better results in lower-level tasks.

4.2. General teaching strategies in primary school language lessons

To determine the general teaching strategies that teachers employ in their native language lessons, EFA on survey data was conducted. Analysis showed that primary school teachers' teaching strategies in language lessons are divided into three groups: supporting active learning, teaching text comprehension, and teaching grammar. First, the strategy to support active learning in native language lessons consists of several teaching activities in which the teacher's role is to ensure that students are involved in the learning process. Second, teaching text comprehension includes teaching activities, such as strengthening vocabulary, dividing the text into parts, identifying the main idea, and teaching text analysis. The third strategy – teaching grammar – mostly involves teaching activities such as practising and rehearsing techniques associated with grammar. All three groups of teaching strategies were employed to some extent in the primary school native language lessons.

Differences between strategies used at the first (Grades 1–3) and second (Grades 4–6) school stages were examined. The Kruskal-Wallis test indicated that teachers of the first school stage preferred to support active learning more often than teachers from the second school stage. First-school-stage teachers stressed the importance of conducting class discussions, brainstorming, and other activities that encourage active participation from students. In addition, teaching strategy use was compared separately in the first and second school stages. Results from the Friedman statistical test revealed that first-school-stage teachers used all three strategies significantly differently. The strategy used the most among first-school-stage teachers was supporting active learning. When comparing these teaching strategy preferences with those in the second school stage, a significant difference was identified. Contrary to the first school stage teachers, those in the second school stage favoured the grammar strategy, often employing activities such as rehearsing, practising, and memorisation.

The next aim was to examine the type of teaching profiles that could be identified among primary school teachers. Six teaching strategy profiles were identified with the help of the cluster analysis (see Figure 3).
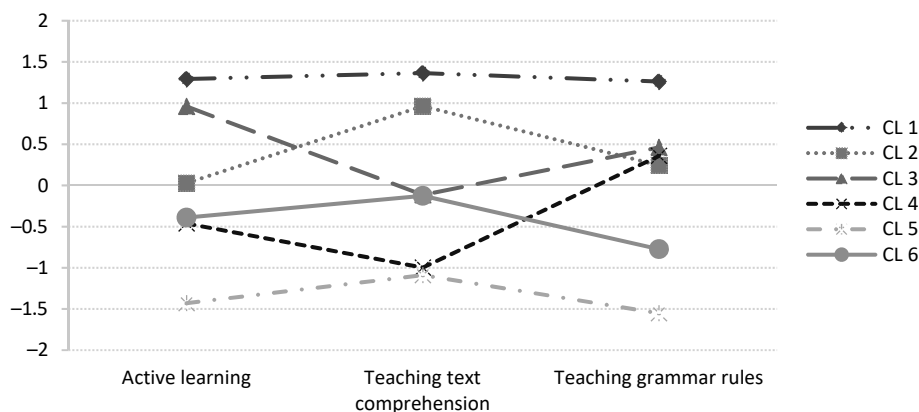
Figure 3. Standardised scores of three teaching strategies from six profiles (see Article II). *Note:* CL = cluster

In these profiles, frequency of use for the strategies was expressed as low, medium, or high. More specifically, four of the six profiles indicated favouring a specific teaching profile. The first (and largest) profile of teachers (27.2%), referred to as *ACT-high* (Cluster 3), selected the strategy of supporting active learning in their language lessons. These teachers valued discussion, role-play, and other teaching methods that encourage students to take a more active role in their learning. Most of these teachers taught students in the first school stage. The second specific teaching profile (referred to as *TC-high*; 19.6%) implemented teaching text comprehension. Teachers in this profile mostly applied activities such as retelling and rewriting (Cluster 2). These teachers also supported students' active participation in lessons and promoted their grammar skills. In this profile, second-school-stage teachers outnumbered first-school-stage teachers. The third profile (referred to as *GR-low*; 13%) related to low grammar instruction and average usage of other strategies such as supporting active learning and teaching text comprehension (Cluster 6). In this profile, first-school-stage teachers were the dominant group. Finally, the smallest number of teachers (11.4%) were in the profile referred to as *TC-low* (Cluster 4), which indicated teachers' low usage of teaching text comprehension and average usage of active learning and teaching grammar rules. Contrary to the previous study, the number of second-school-stage teachers exceeded the number of first-stage teachers in this profile.

Approximately one third of all the respondents belonged to mixed teaching profiles. The biggest mixed group of teachers (*Comb-high*; Cluster 1), included teachers (21.2%) who used all three teaching strategies – supporting active learning, teaching text comprehension, and grammar rules – in their classrooms. Teachers from the first school stage mostly belonged to this profile. These teachers stressed the importance of supporting students' text comprehension using a variety of teaching strategies. The second mixed subgroup of teachers (7.6%) was referred to as the *Comb-low* profile. Teachers from both school stages considered their frequency of use all strategies as low (Cluster 5).

4.3. Impact of language teaching strategies on text comprehension, vocabulary, and reading interest

The study examined the impact of language teaching strategies on students' text comprehension, vocabulary, and reading interest. For this purpose, path analysis was conducted. After modifying the hypothesised model (see Figure 1 from the data analyses), the final model fitted the data well: $df = 4$; $\chi2 = 2.307$; $p < .001$; CFI = 1.00; IFI = 1.005; RMSEA = .00. In the final model, the standardised direct effects of language teaching strategies on students' results and reading interest in third grade are presented in Table 3.

Table 3. Standardised direct effects of language teaching strategies on students' interest in reading and reading outcomes (from Article III).

Teaching strategies	Interest in reading	Vocabulary knowledge	Understanding the text
Developing reading interest	.23	.35	.32
Developing vocabulary		.09	
Teaching text comprehension	−.07	−.16	−.12
Teaching grammar	−.06		−.12

Note: All effects are statistically significant, $p < .05$.

The paths demonstrate that teachers developing students' reading interest also supported their vocabulary and text comprehension. Therefore, teachers who stressed the importance of supporting students' reading interest through their teaching not only enhanced the third grade students' reading interest but also expanded their vocabulary knowledge and understanding of the text. A positive impact was identified on students' vocabulary knowledge from developing vocabulary frequently during the same school year. Contrary to these positive effects, the analyses revealed that frequent use of activities for teaching text comprehension had a negative impact on students' text comprehension, vocabulary, and reading interest results. While teachers used teaching text comprehension more frequently, students' text comprehension, vocabulary, and reading interest diminished compared to when teachers used the strategy less often. Another negative impact on students' reading interest and their understanding of the text was identified from frequent use of activities to teach grammar. Teachers used different strategies believing that would be effective; however, it was shown that their impact was not the same.

4.4. Effects of teaching strategies on vocabulary, text comprehension, and reading interest through primary school

The direct and indirect effects of teachers' teaching strategies on their students' vocabulary, text comprehension, and reading interest throughout primary school were studied. To identify the direct effects of third-grade language teachers' teaching strategies on their students' results, three SEMs were constructed. Fit indices of these three models are presented in Table 4.

Table 4. Fit indices of Grade 3 teachers' teaching strategy models (from Article IV).

Teaching Strategy	Fit Indices of the Models				
	χ^2	CFI	TLI	IFI	RMSEA
1 Vocabulary	289.002	.90	.90	.91	.05
2 Text comprehension	363.882	.92	.90	.92	.05
3 Reading interest	290.132	.91	.90	.91	.05

Note: All models are statistically significant, $p < .01$; χ^2 = chi-square test of model fit; CFI = comparative fit index; TLI = Tucker–Lewis index; IFI = incremental fit index; RMSEA = root mean square error of approximation.

The direct effects of third-grade teachers' teaching strategies on their students' results during the same school year were identified. Supporting students' reading interest was found to have the strongest positive effect on the students' vocabulary results ($\beta = .50$; $p < .01$). Therefore, teachers who enhanced students' reading interest by their teaching approach consequently supported students' vocabulary knowledge during the same year. There were also positive smaller effects in the third grade on students' vocabulary interest ($\beta = .25$; $p < .01$) and reading interest ($\beta = .22$; $p < .01$) as a result of supporting students reading interest. Teaching methods used in native language lessons had a direct effect on students' results, and emphasis on supporting reading interest had a positive effect not only on students' reading interest but also on their vocabulary and text comprehension results. There were also positive direct effects on students' vocabulary results ($\beta = .23$; $p < .01$) and text comprehension ($\beta = .19$; $p < .01$) from developing vocabulary. The teaching strategies that teachers used to promote students' text comprehension were found to have some negative effects on third-grade students' results. Frequent use of teaching text comprehension had a negative effect on third-grade students' vocabulary, text comprehension, and reading interest (β ranging from $-.11$ to $-.14$).

To determine the direct and indirect effects of first-grade teachers' teaching strategies on their students' text comprehension, vocabulary, and reading interest in both Grades 1 and 3, a mediated SEM was constructed. The final mediated model (Figure 4) was conducted by modifying the hypothesised model (see

Figure 2 from the data analysis). The model fit indices for the SEM model were acceptable (Hu & Bentler, 1999): df = 337, $\chi2$ = 525.278, p =.000, CFI = .90, TLI = .90, IFI = .90 and RMSEA = .05.

GRADE 1: TEACHERS   GRADE 1: STUDENTS   GRADE 3: STUDENTS
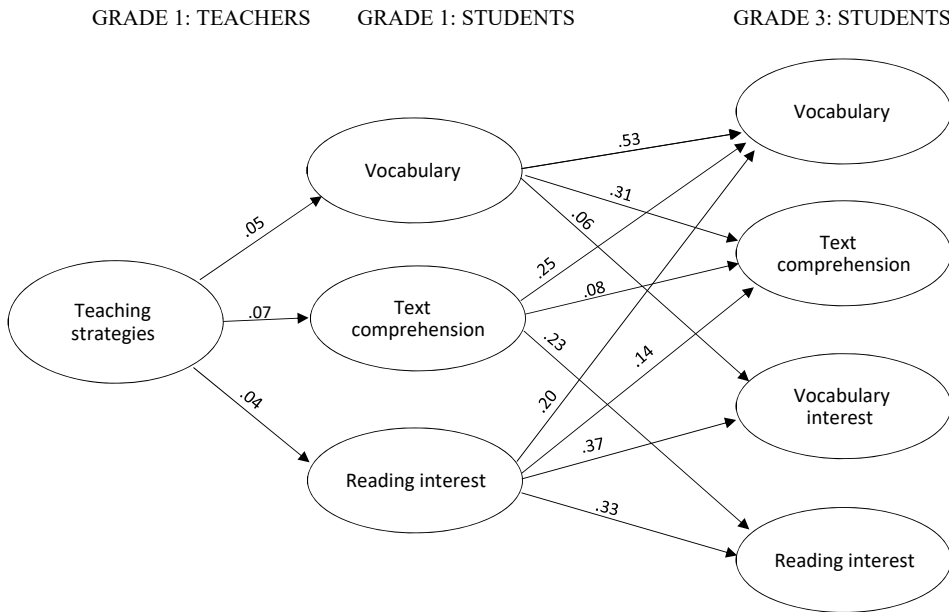
Figure 4. Mediated model of direct and indirect effects of teachers' teaching strategies on students' outcomes and interest (from Article IV).

The analyses revealed that the direct effects of first-grade teachers' teaching strategies on first-grade students' reading interest, text comprehension, and vocabulary were positive but very small (Figure 4).

The indirect effects of teaching strategies on the students' results in Grade 3 via the effects of students' results in Grade 1 were calculated. The teaching strategies implemented by teachers in the first grade had the biggest indirect effect on students' vocabulary in Grade 3 (β = .06; p < .01). A small indirect effect was calculated for students' text comprehension in Grade 3 (β = .03; p < .01). Analysis revealed that strategies used by the first-grade teachers had little effect on students' reading interest (β = .03; p < .01) and vocabulary interest (β = .02; p < .01). The direct effects of teachers' teaching strategies on students' reading outcomes and reading interest were stronger than the indirect effects.

5. DISCUSSION

The advancement of text comprehension is one of the foremost goals in primary school instruction. It is a complex activity, requiring prudent and age-appropriate instruction with the use of different teaching strategies (Calero & Escardíbul, 2019; Foorman et al., 2006). Carefully selected teaching strategies can improve students' reading skills and reading interest (Wigfield et al., 2016). By understanding how teaching strategies affect students' native language competence, teachers can support students' reading outcomes in the best possible way. This doctoral thesis presents the investigation of teaching strategies used by Estonian primary school teachers in their native language lessons and the cross-sectional and longitudinal effects on students' text comprehension, vocabulary, and reading interest. In the first part of the discussion, students' age and gender differences in vocabulary and text comprehension are analysed. The second part provides an overview of general teaching strategies in the primary grades, while the third part discusses the direct and indirect effects of language teaching strategies on students' reading results and interest. The final part of this chapter addresses the limitations and strengths of the doctoral thesis.

5.1. Longitudinal differences in vocabulary and text comprehension in primary grades

Study I of the doctoral thesis focused on students' age and gender differences in vocabulary and text comprehension in primary grades (Article I). First, the changes in students' vocabulary skills were examined. It was revealed that students had the highest vocabulary result in fourth grade, with the results diminishing in the fifth grade. There are multiple explanations for this result. First, word acquisition differs according to word type. For primary school students, it is easier to acquire nouns with specific meanings and more difficult to learn words and verbs with abstract meanings (Saxton, 2010). In Study I, the number of abstract words increased in Grade 5 in comparison with Grades 3 and 4. This could be why the students' results were lower in Grade 5. For example, the meaning of some words (for example, *grave, clumsy*) might be too abstract for the students, although these words appeared in the text. Second, there was greater variety of word options and vocabulary exposure frequency. The vocabulary task in which students were required to choose words with the correct meaning from a word pool included more options in Grade 5 than in Grade 4. Previously, it has been found that the number of options in multiple-choice tasks influence students' performance. Thus, when the number of options increases, the likelihood of answering correctly with a random selection decreases (Rodriguez, 2005). Results show that when acquiring the meaning of words, it is important that new words are used often in a text (Cruse 2004) and for the most effective results, target words should be repeated at least six times in a text (Waring & Takaki, 2003). In addition to text-related

factors, teaching methods may play a role in students' results. For example, when the teacher repeats the new words and uses them in different contexts, this helps students' vocabulary development (Cruse, 2004). As shown by previous research, teaching approaches can have an impact on students' native language results (Cain & Oakhill, 2011; Francois, 2016).

When comparing groups according to gender, it was found that in terms of vocabulary and text comprehension, girls continually outperformed boys throughout the three-year period. These results confirm previous findings in terms of gender differences in students' verbal abilities, which is considered an important factor for vocabulary knowledge and text comprehension (Cain & Oakhill 2011; Klecker, 2006; Saxton, 2010). One reason why girls outperformed boys might be that girls have more rapid mental development than boys during primary grades (Logan & Johnston, 2010; Prado & Plourde, 2011). There is consistent evidence that girls outperform boys on measures of reading in all age-groups. In prior international studies that examined reading comprehension among 10-year-old children, gender differences favouring girls were found in the results of every participating country (Mullis et al., 2003; Mullis et al., 2007). An alternative explanation concerns motivation towards reading. Gender differences have been found in relation to students' reading motivation, which is associated with levels of reading comprehension (Logan & Johnston, 2010). Moreover, girls are more likely to read in their leisure time due to their higher intrinsic motivation and reading interest. In turn, higher motivation promotes their text comprehension skills (Lerkkanen et al., 2018; Schiefele, Stutz, & Schaffner, 2016; Tang et al., 2017).

Finally, the associations between students' vocabulary knowledge and text comprehension were explored, and it was found that there were positive correlations between text comprehension and vocabulary tasks in all three years. Furthermore, their text comprehension in third grade was associated with their vocabulary results in fourth grade. Vocabulary is the main factor that affects text comprehension (Alvermann & Eakle, 2003; Cain & Oakhill, 2011; Wigfield et al., 2016), and to understand the meaning of the text, students need to know a certain number of words (Nagy & Scott, 2000). From another perspective, it is necessary to keep in mind that correlations between text comprehension and vocabulary are reciprocal and they can have mutually beneficial effects (Gentilini & Greer, 2020). For example, written texts can support vocabulary building because they provide contextual information that can help students to infer meaning for yet-unknown words (Nagy et al., 1985). These reciprocal relationships could also appear and affect the chain of events where limited vocabulary reduces students' text comprehension. Without basic comprehension, the subsequent vocabulary building might be minimal (Torppa et al., 2020). To explain the overall findings that students' results progressed over time, it is important to shed light on the fact that early reading abilities are a strong predictor of later reading achievement (Gentilini & Greer, 2020). Therefore, if students have well-developed reading skills in the third grade, it can be assumed that their results will also be good in the fourth and fifth grades.

5.2. Primary school teachers' general teaching strategies

In Study II, the general teaching strategies that teachers employ in their native language lessons were examined (Article II). It was found that primary school teachers rely upon three general strategies: supporting active learning (which was the most popular among the first-school-stage teachers), teaching text comprehension, and teaching grammar. These results were in line with the Estonian National Curriculum for Basic Schools from which general teaching strategies are mainly used in the first stage of primary school (Grades 1–3) and learning is more integrated and less subject based (Vabariigi Valitsus, 2011/2014). General teaching strategies are derived from different teaching approaches. For example, the way teachers support students' active learning comes from a learning-centred teaching approach that promotes students' active participation in the classroom (Kember & Kwan, 2000). When students start primary school, they are accustomed to learning through games and active participation and at this age they can quickly lose concentration (Bradbury, 2016). Therefore, active learning encourages students to actively construct and participate in their learning (Konopka et al., 2015). For example, fewer distractions were recorded in active learning classrooms (for example where demonstrations, discussions, and questions were used) than where only traditional teaching was used (Bunce et al., 2010).

Popularity for supporting active learning considers that while teachers promote students' active involvement in the classroom, intrinsic motivation (including reading interest) among students will be supported simultaneously (Weimer, 2012). Reading interest supports students' text comprehension (Gentilini & Greer, 2020). According to Weimer (2012), to accomplish the goal of promoting students reading interest (and consequently their comprehension skills), teachers should engage students in the complicated task of learning. When teachers are able to teach students how to solve problems, think critically, apply information, and integrate knowledge through active learning, students not only learn the necessary content, they also learn how to learn. Whilst popular among teachers, teaching through active learning is not without problems. Many teachers are already experts in this field and have acquired the skills to analyse or synthesise information; therefore, they may overlook the importance of teaching these skills to students. Thus, it is all the more important to realise that students do not automatically learn text comprehension skills. Consequently, teachers need to implement teaching strategies accordingly (Weimer, 2012). In addition, many of the activities that characterise teaching through active learning (such as role-playing, preparing group assignments, demonstrating, and modelling) may require considerable preparation before instruction begins. Thus, teachers may not always have the time to consistently employ this active learning strategy (Felder & Brent, 2009).

The second general teaching strategy used by primary school teachers was teaching text comprehension. A fundamental expectation of primary instruction is that students successfully learn how to process words, sentences, and eventually, entire texts. The development of text comprehension does not happen

spontaneously: it necessitates precise instruction using diverse teaching strategies (Calero & Escardíbul, 2019; Foorman et al., 2006; Prado & Plourde, 2011). Teaching text comprehension was preferred by primary school teachers because this strategy can derive from both content-centred and learning-centred teaching approaches. Teachers employ strategies to achieve their goals in the classroom and they can accommodate the strategy accordingly to their students' needs and skills (Connor et al. 2013; Vhurumuku & Chikochi, 2017). For example, in one longitudinal study, it was found that primary school teachers adapt the instruction they give to a particular student according to students' academic performance (Nurmi et al., 2012). Therefore, in some cases, teachers might use teaching text comprehension where the elements from the content-centred teaching approach dominate (for example, building the students' factual knowledge where students spend more time listening and remembering) (Trigwell et al., 1994). In other cases, the same strategy with more elements from the learning-centred teaching approach may be used (for example, teachers assist students with how to evaluate the meaning of the text through discussion). Therefore, the focus changes from what the teacher does to what the students learn to achieve the goal in the classroom (Mostrom & Blumberg, 2012).

A third popular general teaching strategy used in native language lessons was teaching grammar. This strategy might be popular among primary school teachers because it is beneficial for language learning, specifically in expanding vocabulary and acquiring knowledge of grammar (Trigwell et al., 1994). An additional benefit in teaching through grammar is the ability to simultaneously reinforce the student's understanding of the syntactic relationships between words (Hillocks & Smith, 1991). Information transmission is focused on facts and skills. It is assumed that students do not need to be very active in this teaching–learning process because this kind of teaching comprises activities such as lecturing, direct instruction, demonstration, and drills (Perry et al., 2007; Serin, 2018). The popularity of teaching grammar can be explained because sufficient grammar knowledge is integral to reading, meaning that teachers are somewhat obligated to devote at least partial instruction to grammar (for example, punctuation, subject-verb agreement, and modifiers). Because the vocabulary of grammar can be difficult, teachers should remove any abstract terminology to reinforce these concepts for their students (Sekelj & Rigo, 2011). Teaching grammar is important and complex and cannot simply be memorised or taught in isolation (Calkins, 1980).

In Study II, preferences for general teaching strategies were also divided according to school stages. Teachers in the first school stage (Grades 1–3) favoured supporting an active learning strategy. One possible explanation for this finding is the limited attention span of younger children in the classroom (Bunce et al., 2010), for which teaching through active learning may mitigate. Younger students benefit more acutely from active learning, as they lack the capacity of older students to learn in a traditional lecture-style classroom (Grunert, 1997). Discussion, role play, and other activities may be useful for maintaining the engagement levels of younger students whose attention may not be as focused as

that of older students (Grunert, 1997). However, teachers in the second school stage (Grades 4–6) tended to prefer teaching through grammar. This result is in line with previous studies, where it was determined that advanced knowledge of grammar favours the development of students' text comprehension in later classes (Duke & Carlisle, 2011). Moreover, the teaching of grammar is most effective when students have already acquired primary reading skills and basic vocabulary in earlier grades (Sekelj & Rigo, 2011).

Finally, as discussed in Article II, teachers with different teaching profiles were classified into six distinct groups according to their strategy preference. In four of the groups, teachers tended to employ one type of strategy in their native language lessons, and in the other two groups teachers combined different strategies. Teachers within a single type of strategy profile favoured one dominant strategy in the classroom: either supporting active learning, teaching text comprehension, or teaching grammar. These findings agree with some previous studies; namely, where prioritising one strategy over multiple strategies might be more effective in accomplishing the teacher's objectives for classroom instruction, as stated by Bonwell and Eison (1991) and Fink (2003). Some Estonian teachers use certain teaching strategies regularly in their classrooms (such as grammar instruction), whereas others struggle to employ any strategies at all (Uibu & Kikas, 2014).

By contrast, teachers with combined-strategy profiles valued mixing different strategies to achieve their goals in the classroom. These primary school teachers preferred to combine multiple general teaching strategies in their lessons. One possible explanation for this might be that they were attempting to make their teaching more versatile (Tang et al., 2017). Because students have individual needs and abilities, teachers should use diverse strategies (Perry et al., 2007; Serin, 2018; The Estonian Lifelong Learning Strategy, 2014, 2020). In their study, Tang and colleagues (2017) found that among 70 third-grade teachers in Estonia and Finland, teachers often combine their teaching strategies. These authors suggest that the use of balanced teaching with different strategies has stronger association with students' reading development than an emphasis on one specific teaching strategy. An explanation for teachers with a combined-low profile may be that the teachers are not aware of the efficiency of different teaching strategies; therefore, they rarely use these strategies (Schaik et al., 2018). In addition, some teachers use lesson time more efficiently than others (Uibu & Männamaa, 2014).

5.3. Cross-sectional and longitudinal effects of teaching strategies on students' vocabulary, text comprehension, and reading interest

Studies III and IV investigated how teaching strategies can directly or indirectly effect students' reading and interest. First, the direct effects of language teaching strategies on students' vocabulary, text comprehension, and reading interest were

examined. Frequent use of supporting reading interest in the third grade had positive direct effects on students' vocabulary, text comprehension, and reading interest in the same year (Articles III and IV). These findings are aligned with prior studies, which have found that the use of appropriate activities to promote reading interest will improve students' vocabulary (Angelos & McGriff, 2002), text comprehension (Wigfield et al., 2016), and reading interest (Edmunds & Bauserman, 2006). Examples of teaching activities that promote reading interest include providing age-appropriate readable texts, acknowledging students' accomplishments, having discussions about the topic, providing positive feed-back, and collaborating with students to set goals for the lesson (Guthrie & Klauda, 2014). Motivational factors may explain unique variances in reading comprehension (Taboada et al., 2009; Wigfield et al., 2016). In addition, it could be argued that the positive results in students' vocabulary, text comprehension, and reading interest were due to the teachers' efforts to create a classroom environment where students were able to enjoy their reading. As Dong and colleagues state, a pleasant environment will have a positive effect on students' text comprehension skills and also on their further reading interest (Dong et al., 2019).

Second, frequent use of developing students' vocabulary had a positive direct effect on students' vocabulary results in the third grade. In Studies III and IV, it was shown that teachers used developing vocabulary with teaching activities, such as presenting the word in a meaningful context, defining the new word in a student-friendly way, demonstrating examples of how to use the word, and asking students to create their own examples. Results from other studies confirm that comprehensive, multifaceted vocabulary instruction produces positive vocabulary results as well as text comprehension among students (Biemiller & Boote, 2006; Elleman et al., 2009; Ford-Connors & Paratore, 2015). A meta-analysis of studies conducted among students in Grades 1 to 12 revealed the effect of vocabulary interventions on students' text comprehension. Thus, teaching vocabulary was shown to be effective at increasing students' comprehension (Elleman et al., 2009).

There are other possible explanations for the positive effects of frequent use of developing vocabulary on students' vocabulary results in the third grade. Teachers are aware that students' limited vocabulary will hamper their reading skills (Francis et al., 2006); therefore, it is necessary to develop their vocabulary skills considerably. Vocabulary size is related to comprehension, and is a predictor of reading ability and overall academic achievement (Stahl & Nagy, 2006). Positive results are also likely related to the numerous methods of teaching vocabulary. More specifically, teachers can choose a suitable strategy according to their students' individual needs and lesson themes. Teaching new vocabulary in context is the key to positive vocabulary growth (Cain & Oakhill, 2011). Unfortunately, some teachers might use more traditional vocabulary teaching (such as writing words multiple times, and using unfamiliar words) (Biemiller & Boote, 2006). Some teachers adopt these methods because they have insufficient

specific knowledge in vocabulary teaching to provide interesting instruction with multifaceted activities.

Third, in Studies III and IV, the negative direct effects from comprehension-specific activities on third-grade students' rates of comprehension were found. It should be explained that several factors influence text comprehension. First, teaching comprehension should begin with teaching how to decode words (Cruse, 2004; Cain & Oakhill, 2011), then teaching how to read fluently, and finally vocabulary should be developed (Nagy et al., 1985). Expanding students' breadth and depth of vocabulary is necessary while developing text comprehension (Dickinson et al., 2019; Rupley et al., 1999), otherwise, the opposite result may occur if the importance of vocabulary development is overlooked. For example, in earlier studies, analogical negative results were explained by insufficient vocabulary instruction (Klinger et al., 2010; Taylor et al., 2002). Another way to explain these negative results is when teachers stress the importance of decoding and widening students' vocabulary whilst omitting to introduce grammatical constructions. Grammar is knowledge of the language system, and through grammar students learn how to make sense of the text (Gleason & Ratner, 2009).

In addition, frequent use of teaching text comprehension had a negative direct effect on students' reading interest (Articles III and IV). In accordance with the present results, previous studies have demonstrated that too much time spent on teaching text comprehension had been too demanding for some students and has prevented their further development (Ruotsalainen et al., 2020; Torppa et al., 2019). Teachers should use fewer comprehension-specific activities than they actually do. The reasoning behind the negative results could be the way teachers teach text comprehension, which demands various multifaceted activities where students are actively involved in the learning process and their thinking skills are challenged (Bowyer-Crane et al., 2017). When teaching text comprehension becomes monotonous and does not present a challenge to students, it may have adverse effects on their vocabulary, text comprehension, and reading interest (Lerkkanen et al., 2016). Previous research suggests that when teachers repeat new vocabulary and texts, students become less interested in reading and lack motivation (Sekelej & Rigo, 2011). Another reason for the poor results is that the Estonian National Curriculum for Basic Schools for the first school stage (Grades 1 to 3) prescribes the importance of promoting text comprehension rather than supporting students reading interest (Vabariigi Valitsus, 2011/2014). Thus, prioritising the acquisition of reading-related skills over reading motivation and engagement may discourage teachers from focusing on encouraging students reading skills. Teachers should recognise that there are two equally important reading goals: to teach students to read and to teach students to *want* to read (Gambrell, 2015). Furthermore, the results are also likely to be related to teachers' negative emotions that may give the impression that learning to read is unpleasant as suggested by Silinskas et al. (2016). Negatively loaded support in reading also transmits the message that a particular student is not doing well in comparison to their classmates, and this may increase their feeling of incompetence (Wigfield & Tonks, 2004). Teaching strategies should therefore encourage students to be

active participants in the classroom without judgment, and with teachers supporting students to participate in discussion, role-play, or dramatisation (Harmin & Toth, 2006).

In Study III, frequent use of teaching grammar had a negative direct effect on students' reading interest and text comprehension. To explain these negative results, the focus is on the way that grammar is taught. There are several methods of implementing grammar instruction and teachers should use the most appropriate approach according to their students' age, needs, and abilities. When students enter school, they have already developed certain grammar constructions independent of any formal schooling. Given their relative level of familiarity with grammar, formal instruction might seem unnecessary or difficult to understand (Haussamen et al., 2003). Although traditional rule-based grammar teaching is appropriate for younger students (due to the use of suitable teaching activities), it may still be too difficult for students to comprehend if activities are not age-appropriate (Foorman et al., 2006).

In Article IV, the longitudinal effects of the teaching strategies used by teachers in Grade 1 were examined and were found to have few positive indirect effects on the students' vocabulary in Grade 3. One possible explanation for the growth in students' vocabulary may be the influence of teachers over the students reading habits (Cain & Oakhill, 2011). Teachers build a foundation of reading habits at the beginning of the primary grades that affects students' vocabulary growth in the upper grades of primary school. Cain and Oakhill (2011) demonstrated that early enjoyment of books should be nurtured, and this can be further developed in the primary grades to support students' vocabulary. The second explanation concerns teachers' effectiveness in terms of teaching. Effective teachers demand engagement with the task, are well prepared, and match task difficulty to the students' abilities. Teachers should be aware of their students' strengths and weaknesses and prepare their lessons accordingly (Tomlinson, 2001).

Next, the teaching strategies in Grade 1 had an indirect positive effect on students' text comprehension in Grade 3 (Study IV). In line with the findings, it has been demonstrated that when teachers use various strategies to support students' vocabulary and text comprehension, positive results occur (Biemiller & Boote, 2006; Ford-Connors & Paratore, 2015). Comprehension instruction involves complex, long-term preparation, as well as commitment (Pressley & Block, 2002). A further explanation for the positive results may be that using balanced reading instruction supports students' text comprehension skills in the best possible way (Snyder & Golightly, 2017). For example, some teaching activities rely directly on promoting comprehension skills, such as teaching how to understand the main idea (Steiner & Magee, 2019), questioning, headlining, or dividing the text into parts (Duke & Pearson, 2002), whereas other activities concentrate more on how the texts are read (Eason et al., 2012). In the current study, teachers used a combination of teaching vocabulary and teaching text comprehension. The positive results may have occurred because teachers used the combination of these strategies and also relied on balanced reading instruction matched to the students' needs and abilities.

Finally, the findings in Article IV showed that teaching strategies in Grade 1 had a positive weak indirect effect on students' reading interest in Grade 3. This is consistent with the results of previous research that demonstrated the importance of intrinsic reading motivation, as well as the method of teaching, together with the methods teachers employ to increase engagement with the text (Dong et al., 2019; Perry et al., 2007). One way to increase students' reading interest may be through constant positive feedback and encouragement (Edmunds & Bauserman, 2006). When students feel confident in reading, this will encourage them to read more, which in turn promotes their reading interest.

The positive longitudinal findings may be explained by the structure of the Estonian education system that is conducive to longitudinal research, as the same teachers teach the same students through different grades. However, it becomes difficult to distinguish between teacher effects and other effects. However, using a longitudinal study with the same teachers throughout several years of schooling is the only possible solution for determining teachers' long-term effects on students' results. The weak, positive indirect effects on students' vocabulary, text comprehension, and reading interest of teaching strategies used by teachers in Grade 1 demonstrated that teachers need to change their teaching strategies over the years based on students' age, abilities, and cognitive skills.

5.4. Limitations and strengths of the study

In the current doctoral thesis, five issues have been identified that limit the wider generalisation of the results. The first concerns the longitudinal design: students were involved in the study for three consecutive years in Study I and at two-year intervals in Study IV. The samples in Study I decreased by 36% over the three years. The sample in Study IV declined by 26% compared to the first measurement point, mainly due to students' moving away or being absent when measurement points were taken. In future studies, students who will knowingly be absent should be tested at another time.

The second limitation concerns the research instruments. Only one type of reading text was used in the students' reading test (Studies I, III, and IV). In future studies, using different types of texts could provide a broader understanding of students' text comprehension. There are also concerns related to the teachers' teaching strategy questionnaires used to measure the strategy used in native language lessons. When interpreting the results, it is important to be aware of the nature of self-reported questionnaires, as they can often reflect the teachers' beliefs rather than their actual use of such strategies (Uibu et al., 2017). Nevertheless, self-reported questionnaires are widely implemented instruments for measuring the frequency of strategy use (Akinci & Saunders, 2015). To achieve a more detailed insight into primary school teachers' strategy usage, future studies should also contain observations, interviews and/or interventions.

Third, the issue of procedure was also a problem area for third-grade students in Studies III and IV, as teachers conducted the students' tests in the classroom

by themselves, which may have affected the results in these studies. Therefore, in future such studies, the researchers should pay attention to the quality of testing conditions. For example, e-testing could be performed, or teachers could be thoroughly instructed how to conduct the testing procedure in an objective manner.

The fifth limitation relates to the findings. Some effects in the models were of low statistical significance (Study III and IV); therefore, generalising the results to other groups of students and teachers should be done with caution. However, the models themselves demonstrated at least acceptable fit indexes in their description of the data.

Despite these limitations, several strengths should also be highlighted. The most important was its complex design. Students (Study I) and teachers (Study II) were examined in both separate and combined studies (Studies III and IV). Both cross-sectional (Studies II and III) and longitudinal studies (Studies I and IV) were used.

A further strength was that the four studies of the thesis formed an integrated whole. Study I demonstrated that students' text comprehension results at the intermediate level were sufficient, but below-average results were poor. Based on the conclusions of these results, further research was conducted to identify teachers' teaching strategies in native language lessons (Study II). The effectiveness of these strategies was studied from both short-term (Study III) and long-term (Study IV) perspectives. Together, these four studies formed a coherent whole, with Study II built on the results of Study I. In addition, Studies III and IV were based on the conclusions of previous studies.

The thesis also concluded that two complementary approaches to data analysis – the variable-oriented and the person-oriented – were used to achieve a better understanding of the results of the research. With a variable-oriented approach, generalised comparisons were made at the group level (Study I, II, III, IV). The more detailed, person-oriented approach enabled investigation of individual differences (Study II). In Study II, cluster analysis was used to find non-overlapping groups where the members in the same group have similar value patterns (Bergman & Wångby, 2014).

As a result of conducting this doctoral thesis, a new factor was found: the motivation factor (namely, interest in reading). This is a novel finding because it produced results that have not been highlighted or addressed in this way in previous studies. The results concluded that teachers should stress the strategies that are aimed at developing interest in students. Therefore, more attention should be given to the development of interest than to the mere development of comprehension or vocabulary. Thus, through the development of interest, it is possible to teach comprehension and vocabulary.

6. CONCLUSIONS AND IMPLICATIONS

6.1. Conclusions

Text comprehension is a complex cognitive process that involves decoding words and analysing information. It is affected by several factors, the most important of these being student-related factors (such as vocabulary development, age, gender, and reading interest) and teachers' teaching strategies. Teaching strategies are related to theoretical concepts and approaches to learning (Halliday, 1993). In the current thesis, the general teaching strategies are derived from instructional approaches: traditional and constructivist (Brophy, 1999). Moreover, the language teaching strategies are derived from balanced reading instruction (Pressley, 1998; Snyder & Golightly, 2017) and teaching strategies that promote students' interests are characterised by a learning-centred teaching approach (Stipek & Byler, 2004). However, there remains a need to determine the effectiveness of teaching strategies in developing students' text comprehension, vocabulary, and reading interest. The objective here was to determine age and gender differences in text comprehension and the effects of teaching strategies on primary school students' text comprehension, vocabulary, and reading interest.

Based on the results discussed in Study I, it can be determined that changes occur to students' vocabulary knowledge and text comprehension from class-to-class. The assumption that students' vocabulary knowledge improves over the years was partially confirmed. Students had the highest vocabulary results in the fourth grade and the lowest in the fifth grade. Students' vocabulary knowledge and text comprehension develop together by supporting each other. In terms of vocabulary and text comprehension, gender was shown to play a significant role in students' performance where girls continue to outperform boys. Therefore, to provide more support to vocabulary growth and text comprehension among boys, it is necessary to consider their linguistic development and texts should be provided that suit their abilities and interests. Another conclusion is related to associations between students' vocabulary knowledge and their level of text comprehension. Students with good results in the lower grades of primary school also performed well in the upper grades. Therefore, it is necessary to pay attention to text comprehension and vocabulary from the beginning of primary grades.

According to the analysis performed in Study II, Estonian primary school teachers employed three specific types teaching strategies in their lessons: supporting active learning, teaching text comprehension, and teaching grammar. The analysis showed that teachers differ in their use of strategies. Supporting active learning was most popular among first-to-third grade teachers; therefore, it can be concluded that teachers are aware of the effectiveness of this strategy. Meanwhile, fourth-to-sixth grade teachers favoured teaching grammar to their students who already possessed good reading skills and vocabulary knowledge. Person-oriented analysis revealed that the majority of teachers preferred to use one strategy in their lessons instead of combining different ones. Using one in-

depth strategy was found to be the most effective way of achieving teachers' goals in their lessons.

Based on the results of Studies III and IV, Estonian primary school teachers use teaching strategies according to their own beliefs about how these strategies would be conducive to their students' text comprehension and reading interest. Using vocabulary teaching directly improved students' vocabulary, and reading interest strategy supported reading interest, facilitates students' text comprehension and reading interest in the short term (Studies III and IV). The frequent use of developing vocabulary, teaching text comprehension, and supporting reading interest by the teachers contributed positively to students' vocabulary, text comprehension and reading interest in the long term (Study IV). Students who were interested in reading will in turn have better text comprehension skills. Intensive implementation of text comprehension strategy was directly associated with poorer results of students' text comprehension, vocabulary and reading interest (Studies III and IV). The frequent use of teaching grammar had a negative effect on students reading interest and text comprehension (Study III). Therefore, the methods employed by teachers to implement the strategies of promoting text comprehension and teaching grammar can affect the students' understanding and their reading interest. If teachers' instructions do not promote active participation in the classroom, students' reading interest will suffer. Teachers should be aware of their students' strengths and weaknesses in language learning in order to give better support to their text comprehension, vocabulary, and reading interest.

The main findings of the doctoral thesis emphasise that properly chosen general and language teaching strategies help to support students' text comprehension, vocabulary acquisition, and interest in reading. Teachers need knowledge of how and when to implement teaching strategies (e.g., how to use more general teaching strategies at the beginning of primary school and specific teaching activities within these strategies). Teachers should be cautious when implementing text comprehension and grammar strategies. The use of these teaching strategies can affect students' interest in reading, which in turn can inhibit the development of comprehension. The findings of the thesis demonstrate that interest in reading plays an important role in students' text comprehension. The strategy for developing reading interest supported all the studied reading outcomes: students' text comprehension, vocabulary development, and reading interest. If the aim is to promote students' text comprehension, then the importance of reading interest in the process should be recognised. In due course teachers should change their teaching strategies based on their students' age and cognitive skills development.

6.2. Implications and recommendations

At the theoretical and methodological levels, the following implications and recommendations can be taken from this study:

1. The results showed that it is important to realise that text comprehension is not a stand-alone construct. Rather, it is closely affected by several student-related factors (such as vocabulary development, reading interest, age, and gender differences) and teaching strategies. This should be considered in future studies as well as in classroom instruction to obtain good results in text comprehension.

2. In quantitative research, it is advisable to use several different approaches to improve the versatility of the research. Thus, with the help of a variable-oriented approach, comparisons could be made at the group level. The more detailed, person-oriented approach enabled the researcher to investigate individual differences.

3. The validity of the instruments used in a study requires serious attention from researchers. The involvement of teachers, educational researchers, linguists, and psychologists is necessary to develop the most suitable instruments for students (for example, reading tests for measuring vocabulary and text comprehension, reading interest questionnaires for measuring reading interest) and teachers (for example, questionnaires to assess the frequency of use of teaching strategies by primary school teachers in native language lessons). Professionals in their field can help by noting important nuances and adding value to the instruments.

4. The representativeness of sample size plays an important role in the quality of the research, especially concerning the generalisability of the results. When working with smaller samples, measurement error could be greater than when working with larger samples, where sampling error would be decreased.

At a practical level, the following implications and recommendations may be useful for teachers to improve their instruction:

5. The findings revealed that primary school teachers use both general and language teaching strategies in their lessons (Study II, III, and IV). Using suitable instruction according to students' age and need is of utmost importance to gain good results in the language lesson. Therefore, teachers need to know what, when, and how to implement certain teaching strategies in their instruction (for example, using more general teaching strategies at the beginning of primary school).

6. It appeared that extensive use of the teaching grammar strategy has an adverse effect on students' text comprehension (Study III). Grammar is too abstract for some students, and therefore teachers should be careful before implementing grammar teaching in the classroom. For grammar instruction to be effective for students, teachers should make strategic decisions about how it

can be effectively taught (such as using age-appropriate teaching activities that are also interesting for students). In addition, teachers need to be aware of their students' characteristics and use age-appropriate texts and tasks in language lessons to promote their students' text comprehension in the best possible way.

7. This doctoral thesis has shown that reading interest plays an essential role in students' text comprehension (Study III and IV). The strategy of developing reading interest supported all studied reading outcomes: students' text comprehension, vocabulary development, and reading interest. When the goal is to promote students' text comprehension, it is necessary to acknowledge the role of reading interest is in the process.

APPENDICES

Appendix 1. Examples of the text comprehension tasks for Grade 3 (Studies III and IV)

Note: Some examples are given from the whole task.

1. Ordering and sorting.

Instructions: Decide whether the sentences are right or wrong. Write X in the correct box of the table.

Sentences	RIGHT	WRONG
1. The friends celebrated the end of the holiday with cakes and lemonade.		
2. A boy read a new book.		
3. The friends became famous because they released the city from the rats.		

2. Finding the main idea.

Instructions: There are three paragraphs in the text. Find the main idea of each paragraph and underline it in the table.

1st paragraph	a. The friends made plans for their holiday. b. The friends ordered a lot of cakes. c. The friends went to the seaside to have a vacation.
2nd paragraph	a. The friends ordered cakes and lemonade. b. The friends had a filling lunch at the cafe. c. The friends felt restless.
3rd paragraph	a. There was a fresh newspaper under the boy's jacket. b. The paper wrote about how the boys became famous. c. The cats returned to the city.

3. Matching the sentences.

Instructions: Five questions and five answers based on the text are listed below. Select one correct question and answer for each paragraph of the text and write the letters in front of them in the table.

Questions:

a. What did the friends order in the cafe?
b. Why were the friends anxious?
c. What was the friends' vacation like?
d. What were the friends planning in the cafe?
e. What kind of news did one of the boys read from the newspaper?

Answers:

f. The friends planned a vacation.
g. The waitress let the customers wait for too long.
h. The friends didn't have the chance to go on vacation yet.
i. One of the boys read about their fame.
j. The friends could not order anything because the waitress did not come.

4. Summarising the text.

Instructions: What is the text about? Mark the correct sentence with an X.

1. The friends read the newspaper out loud to the customers in the cafe.	
2. The friends drove the cats out of town.	
3. The friends spent a nice afternoon in the cafe.	

5. Evaluating the text.

Instructions: Answer the questions and underline the correct answer for each question.

Question	*Answer*
1. Where did the friends decide to have lunch?	a) The friends had lunch in a theatre cafe. b) The friends had lunch in an outdoor cafe. c) The friends had lunch in an ice-cream cafe.
2. What were the names of the friends?	a) Muhv, Kinghabe, Sammalpool. b) Muhv, Poolking, Sammalhabe. c) Muhv, Kingpool, Sammalhabe.

Appendix 2. Examples of the vocabulary tasks for Grades 1 and 3 (Studies III and IV)

Note: Some examples are given from the whole task.

Instructions: Combine the word in the left-hand column with a similar meaning word from the right-hand column.

Grade 1	
Dream	imagine
Sad	trash
Garbage	feeling blue

Grade 3	
Gape	gaze
Believe	nation
People	guess

Appendix 3. Examples of students' reading interest questionnaires (Studies III and IV)

Note: Students had to mark whether or not they agreed with the statements about reading on a 3-point scale: 1 = *I do not agree*; 2 = *I agree partially*; 3 = *I agree*. Some examples are given from the whole questionnaire.

Instructions: Mark with a cross the answer that applies to you.

a) Reading is interesting for me.

b) I like to read texts with many familiar words.

c) Every day after school I read for 15 minutes for pleasure.

d) I like different word games.

e) I like learning new words in the native language classroom.

f) I like to learn new words through pictures.

Appendix 4. The General Teaching Strategies Questionnaire
(Study II and Study IV)

Note: Teachers had to mark the frequency with which they used described activities on a six-point Likert scale. The whole questionnaire is presented.

Instructions: Put a cross next to the statement that applies to you.

In language lessons, I use…

1   ... teaching, whereby students can get new knowledge through active learning (i.e., role playing, imitation).
2   ... teaching through collaboration and active learning, whereby students have to discuss the current topic or problem.
3   … independent learning whereby students can discover by themselves.
4   … teaching whereby work assignments are combined with active learning.
5   … teaching through active learning whereby students are more active than teachers.
6   … problem solving whereby students learn by themselves in groups.
7   … active learning whereby students must analyse the text they have read.
8   … rewriting the text to help memorise the text better.
9   … retelling the text to affirm the meaning of the text.
10 … different types of texts to ensure an interest in out-of-class reading.
11 … headlines in parts of the texts so that students will understand the idea better.
12 … dividing texts into parts so that students can understand the meaning better.
13 … different text assignments to monitor students' individual development.
14 … grammar rules followed by the opportunity for students to give examples that support the rule.
15 … teaching, whereby at first, samples are presented, after which students must form the specific grammar rule.
16 … grammar rules so that students have to improve the rules with new samples.
17 … different types of texts to develop students' analysis and synthesis skills.

Appendix 5. The Language Teaching Strategies Questionnaire (Studies III and IV)

Note: Teachers had to mark the frequency with which they used described activities on a 6-point Likert scale. Some examples are given from the whole questionnaire.

Instructions: Put a cross against each statement that applies to you.

In language lessons, I use…

1 … discussions about the topic to create reading interest.
2 … age-appropriate texts to prevent decreased reading interest.
3 … introductions to new books to stimulate reading interest.
4 … different types of texts to ensure interest for out-of-class reading.
5 … word games for broadening students' vocabulary.
6 … synonym tasks to improve students' vocabulary.
7 … assignments in which students must find new words from the dictionary to develop their vocabulary.
8 … rewriting new vocabulary from the text to help students memorise words better.
9 … tasks in which students must identify the main idea of the text.
10 … teaching whereby students can ask open-ended questions about the text to analyse its content.
11 … tasks in which I ask students to interpret the content of the text in their own words so that they can understand the main idea of the text.
12 … dividing the text into paragraphs so that students can understand its content.
13 … the main idea of passages to help students understand the idea of the whole text.
14 … assignments where students have to summarise the text to understand its content.
15 … different text assignments that are suited to the individual characteristics of the students.
16 … retelling of the texts to reinforce the comprehension of the text.
17 … different types of texts to develop students' analysis and synthesis skills.
18 … underlining the parts of the text so that students can better understand the message of the text.
19 … dividing text into parts to give students a better understanding of the content of the text.

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SUMMARY IN ESTONIAN

Õpilaste tekstimõistmist ja lugemishuvi toetavad õpetamisstrateegiad põhikooli esimeses kooliastmes

Tekstimõistmine on oluline oskus mis aitab ühiskonnas toime tulla. See on keerukas kognitiivne protsess, mis hõlmab sõnade dekodeerimist ja teabe analüüsimist. Tekstimõistmist mõjutab mitu tegurit, kõige tähtsamateks neist peetakse õpilastest tõukuvaid tegureid (nt sõnavara areng, lugemishuvi, vanuselised ja soolised erinevused) ning õpetajate õpetamisstrateegiaid. Õpetamisstrateegia mõistet võib defineerida mitmeti, näiteks kui konkreetset õpetamistegevust nagu ajurünnak või arutelu (Wehrli & Nyquist, 2003) või kui konkreetsete tegevustega käsitlusi (Cohen, 1996). Siinses doktoritöös on lähtutud järgmisest definitsioonist: õpetamisstrateegia on õpetamistegevuste kogum, mida rakendab õpetaja, et saavutada määratud eesmärgid (Adom *et al.*, 2016). Õpetamisstrateegiad paigutuvad erinevate õpikäsitluste ja teoreetiliste kontseptsioonide alla (Halliday, 1993). Doktoritöös uuriti kahte strateegiate rühma: 1) üldisi õpetamisstrateegiaid ja nende rakendamist eesti keele tunnis; 2) keeleõppe strateegiaid, mille kaudu arendavad õpetajad eesti keele tunnis õpilaste tekstimõistmist, sõnavara ja lugemishuvi. Üldisi õpetamisstrateegiaid rakendatakse sagedamini Eesti põhikooli esimeses kooliastmes, kus õppimine on rohkem lõimitud ja vähem ainepõhine. Õpilaste vanuse ja oskuste muutudes on vaja rohkem spetsiifilisi õpetamisstrateegiaid (nt keeleõppe strateegiad eesti keele tunnis), sest õpetamine muutub ainekesksemaks (Vabariigi Valitsus, 2011/2014). Seetõttu keskendutakse doktoritöös ka nendele keeleõppe strateegiatele, mis on enam levinud põhikooli teises kooliastmes.

Kuna õpetajate õpetamisstrateegiad mõjutavad õpilaste tekstimõistmist, võib nende ebasobiv kasutamine olla üks põhjus, miks on õpilaste tekstimõistmisoskus ajaga vähenenud (Duke & Block, 2012; Spencer & Wagner, 2018). Olgugi et Eesti õpetajad kasutavad eesti keele tundides õpetamisstrateegiaid teadvustatult (Uibu *et al.*, 2010), on õpilaste tekstimõistmisoskus ajas kehvemaks muutunud (Soodla *et al.*, 2019). Hiljutistes rahvusvahelistes uuringutes on leitud, et peaaegu kõik Eesti õpilased ning õpetajad rõhutasid vajadust arendada õpilaste tekstimõistmist. Tekstimõistmistegevuste rohke rakendamine võis aga olla osale õpilastest liiga keeruline ja takistada nende mõistmisoskuse arengut (Ruotsalainen *et al.*, 2020; Torppa *et al.*, 2019). Õpetajad peaksid valima strateegiaid õpilaste arengu ja huvide järgi. Piisav teave õpetamisstrateegiate mõjust õpilaste tekstimõistmise tulemustele on vajalik selleks, et valida sobiv strateegia, mis vastab õpilaste muutuvatele vajadustele ja oskustele tekstimõistmisel.

Arvestades seda, et lugemisoskus on paljude akadeemiliste oskuste eeldus (Snow *et al*., 1998), tuleb kindlaks määrata, mis lugemise arengut mõjutab. Lugemisoskus ja motivatsioonitegurid, nt lugemishuvi, mõjutavad tekstimõistmist samavõrra (Cambria & Guthrie, 2010; Watkins & Coffey, 2004). Teadlikult valitud strateegiad toetavad õpilaste sõnavara, samuti lugemisoskust ja -huvi

(Wigfield *et al.*, 2016). Siiani on tehtud uuringuid, kus fookuses on õpetamis-strateegiate mõju lugemishuvile (Edmunds & Bauserman, 2006; Davis, 2010) ja õpetamisstrateegiate seos tekstimõistmisega (Guthrie *et al.*, 2004; Klinger *et al.*, 2010; Tang *et al.*, 2017). Samuti on teada, milliseid teadmisi ja oskusi tuleks õpilastele õpetada põhikooli esimese kooliastme emakeele tundides (Oakhill *et al.*, 2019; OECD, 2019; Viljaranta *et al.*, 2017). Siiski on vähe teada, kuidas mõjutavad õpetajate õpetamisstrateegiad õpilaste tekstimõistmist ja lugemishuvi. Doktoritöö eesmärk oli välja selgitada õpilaste ealised ja soolised erinevused tekstimõistmisel ning õpetamisstrateegiate mõju põhikooli esimese kooliastme õpilaste tekstimõistmisele, sõnavarale ja lugemishuvile. Eesmärgi saavutamiseks sõnastati neli uurimisküsimust:

1) Millised on õpilaste vanuselised ja soolised erinevused sõnavaras ja teksti-mõistmises põhikooli esimeses ja teises kooliastmes?
2) Milliseid üldiseid õpetamisstrateegiaid õpetajad eesti keele tundides kasu-tavad?
3) Kuidas mõjutavad keeleõppestrateegiad otseselt õpilaste tekstimõistmist, sõnavara ja lugemishuvi?
4) Kuidas mõjutavad keeleõppestrateegiad õpilaste sõnavara, tekstimõistmist ja lugemishuvi põhikooli esimese kooliastme jooksul?

Uurimisküsimustele vastamiseks tehti neli uuringut. Esimese uuringu eesmärk oli välja selgitada õpilaste vanuselised ja soolised erinevused sõnavaras ja teksti-mõistmises kolme aasta jooksul. Uuringus osales 508 õpilast, kes täitsid teksti-mõistmisülesandeid 3.–5. klassis. Oletus, et õpilaste sõnatähenduse tundmine paraneb aastatega, leidis kinnitust osaliselt. Õpilaste sõnavaraülesande tulemused olid kõrgeimad 4. klassis, kuid langesid 5. klassis. Õpilaste soolisi erinevusi analüüsides ilmnes, et tüdrukud edestasid poisse nii sõnavara tundmises kui ka tekstimõistmises kõigil kolmel aastal. Lisaks näitasid tulemused, et õpilased, kellel oli hea tekstimõistmine nooremates klassides, saavutasid paremaid tulemusi ka vanemates klassides. Õpilased, kellel olid kõrged tekstimõistmise tulemused 3. klassis, olid head sõnavara tundmise tulemused 4. klassis, mis omakorda mõjus positiivselt tekstimõistmise ja sõnavara tundmisele 5. klassis. Õpilaste sõnavara tundmine ja tekstimõistmine olid omavahel statistiliselt olulisel määral seotud ($r = 0{,}48$).

Teise uuringu eesmärk oli välja selgitada, milliseid üldisi õpetamisstrateegiaid klassiõpetajad eesti keele tundides kasutavad. Uuringus osales 35 koolist 186 õpetajat, kes õpetasid lapsi 1.–6. klassini. Andmete kogumiseks koostati õpetamis-strateegiate küsimustik, mida katsetati enne põhiuuringut. Muutuja- ja indiviidi-kesksed meetodid võimaldasid analüüsida erinevusi rühma tasandil ja eri profiili-rühmades. Uuringust selgus, et õpetajad kasutasid eesti keele tundides peamiselt kolme eri strateegiat: aktiivset õpetamist, tekstimõistmise toetamist ja grammatika-reeglite õpetamist. Samuti analüüsiti, milliseid õpetamisstrateegiaid õpetajad eelistavad. Ilmnes, et kõige enam eelistasid esimese kooliastme õpetajad aktiivset õpetamist. Seevastu teise kooliastme õpetajad rakendasid kõige rohkem gram-matikareeglite õpetamise strateegiat. Profiilirühmade erinevusi analüüsides selgus,

et õpetajad jagunesid strateegiate kasutamise põhjal kuude rühma. Nelja rühma õpetajad kasutasid tundides rohkem ühte kindlat strateegiat, teised aga kombineerisid eri strateegiaid. Kaks kolmandikku õpetajatest eelistas kasutada rohkem ühte kindlat strateegiat (nt aktiivset õpetamist).

Õpetamisstrateegiad mõjutavad õpilaste tekstimõistmist, sõnavara tundmist ja lugemishuvi otseselt ja kaudselt. Kolmandas ja neljandas uuringus keskenduti nende mõjude analüüsimisele. Mõlemas uuringus osales 18 klassiõpetajat. Kolmandas uuringus osales lisaks 220 kolmanda klassi õpilast ning neljandas uuringus 220 õpilast kahel ajahetkel (1. ja 3. klassis). Kolmandas ja neljandas uuringus ilmnes, et õpetamisstrateegiate efektiivne kasutamine toetab õpilaste lugemist ja lugemishuvi. Seejuures osutus lugemishuvi arendamise strateegia nii tekstimõistmise, sõnavara tundmise kui ka lugemishuvi toetamisel kõige tõhusamaks. Sagedane lugemishuvi toetamise strateegia rakendamine mõjutas positiivselt 3. klassi õpilaste sõnavara, tekstimõistmist ja lugemishuvi samal aastal. Tegevused, mis toetavad õpilaste huvi (nt diskussioonid, rollimängud), edendavad ka tekstimõistmist ning sõnavara tundmist. Lisaks ilmnes, et sõnavara arendamise strateegia sage kasutamine avaldas positiivset otsest mõju õpilaste sõnavara tulemustele 3. klassis. Samas avaldas strateegiate väga intensiivne kasutamine õpilaste lugemistulemustele mõningatel juhtudel ka negatiivset mõju. Kolmandas ja neljandas uuringus selgus, et tekstimõistmise õpetamise ja grammatikareeglite õpetamise strateegial oli negatiivne mõju õpilaste tekstimõistmisele 3. klassis. Nii grammatikareeglite õppimine kui ka teksti analüüsimine ja sünteesimine võib õpilaste jaoks olla abstraktne ja keeruline protsess, mis võib raskendada õpetamisstrateegiate efektiivset rakendamist. See kahandab omakorda õpitulemusi. Kolmandas uuringus ilmnes, et grammatikareeglite sagedasel kasutamisel oli otsene negatiivne mõju õpilaste lugemishuvile ja tekstimõistmisele. Tekstimõistmise arendamise ja grammatikareeglite õpetamise strateegiate rakendamisel on soovitatav lähtuda tunnile seatud eesmärkidest ning õpilaste individuaalsest eripärast.

Lisaks uuriti kaudseid mõjusid. Neljandas uuringus selgus, et sõnavara arendamise strateegia, tekstimõistmise õpetamise strateegia ning lugemishuvi toetamise strateegia avaldasid pikaajalist positiivset mõju õpilaste lugemistulemustele ning -huvile. Õpetajad loovad põhikooli esimeses kooliastmes aluse lugemisharjumustele, mis soodustavad või pärsivad õpilaste sõnavara kasvu ja tekstimõistmist ning lugemishuvi. Esimese klassi õpetajate õpetamisstrateegiate positiivne pikaajalise mõju nõrkus 3. klassi õpilaste sõnavarale, teksti mõistmisele ja lugemishuvile tuleneb sellest, et õpetajad peavad muutma oma õpetamisstrateegiaid lähtuvalt õpilaste vajadustest ajas.

Doktoritöö tulemustest joonistus välja, et põhikooli esimese kooliastme õpilaste tekstimõistmise toetamiseks tuleb arvestada erinevate õpilastega seotud tegurite ning õpetajate õpetamisstrateegiatega. Teadlikult valitud üldised ja keeleõppestrateegiad aitavad toetada õpilaste tekstimõistmist, sõnavara omandamist ja lugemishuvi parimal võimalikul viisil. Õpetajad vajavad kompetentsi selle kohta, millal ja kuidas õppetöös õpetamisstrateegiaid rakendada (nt kuidas kasutada põhikooli alguses üldisemaid õpetamisstrateegiaid ja nende strateegiate raames

konkreetseid õpetamistegevusi). Teatud õpetamisstrateegiate kasutamine võib mõjutada õpilaste lugemishuvi, mis omakorda võib pärssida tekstimõistmise arengut. Õpetajad peaksid tekstimõistmise õpetamisel ja grammatikareeglite rakendamisel võtma arvesse õpilaste vanuselisi eripärasid ja võimeid. Doktoritöö tulemused näitasid, et lugemishuvi mängib õpilaste tekstimõistmisel tähtsat rolli. Lugemishuvi arendamise strateegia toetas kõiki uuritud lugemistulemusi: õpilaste tekstimõistmist, sõnavara arendamist ja lugemishuvi. Kui eesmärk on edendada õpilaste tekstimõistmist, tuleb teadvustada, kui oluline on lugemishuvi roll protsessis.

PUBLICATIONS

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Algklassiõpilaste teksti mõistmine ning lugemishuvi ja klassiõpetajate õpetamis-strateegiad emakeeletundides.

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