Application for doctoral position

1. Curriculum: Educational Science 80338

2. Project title in English: Assessment of text comprehension levels and improving it via teaching strategies

3. Project title in Estonian: Teksti mõistmise tasemete hindamine ja nende arendamine õpetamisstrateegiate abil

4. CERCS speciality. S270 Pedagogy and didactics

5. Doctoral candidate:

<table>
<thead>
<tr>
<th>First name</th>
<th>Surname</th>
<th>Current activity</th>
<th>E-mail:</th>
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</thead>
</table>

When candidates are outside of LTOM or SVHI the assessment of his/her qualifications must be done (up to 400 characters with spaces).

6. Supervisor:

<table>
<thead>
<tr>
<th>First name</th>
<th>Surname</th>
<th>Affiliation</th>
<th>Position:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Krista</td>
<td>Uibu</td>
<td>University of Tartu, Institute of Education</td>
<td>Associate professor of primary education</td>
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<tr>
<td>Mairi</td>
<td>Männamaa</td>
<td>Tallinn University, Clinicum of Tartu University</td>
<td>Senior researcher, clinical psychologist</td>
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7. Research group where the doctoral thesis is being done:

The doctoral thesis is carried out in the frame of teacher education competency center’s project The specific aspects of early childhood and primary education. The main staff of the project connected with the doctoral thesis is:

<table>
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<tr>
<th>First name</th>
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<th>Affiliation</th>
<th>Position:</th>
<th>PhD student</th>
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<tbody>
<tr>
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<tr>
<td>Marika</td>
<td>Padrik</td>
<td>University of Tartu</td>
<td>Lecturer in logopedics and theory of learning difficulties</td>
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<tr>
<td>Aino</td>
<td>Ugaste</td>
<td>Tallinn University</td>
<td>Professor of early childhood education</td>
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<tr>
<td>Helena-Marietta</td>
<td>Rasku-Puttonen</td>
<td>University of Jyväskylä</td>
<td>Vice-Rector, Professor of psychology in education</td>
<td></td>
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8. Description of necessary available resources (equipment, finances):

The PhD candidate has the necessary equipment (computer, SPSS and SLEIPNER statistics, access to the databases of the library of the University of Tartu), and appropriate working and studying environment needed for the doctoral thesis.

9. Doctoral thesis' innovativeness and importance for development of this scientific direction:

As a result of the doctoral thesis, the standardized tests will be worked out to measure the students’ comprehension of different types of texts (linear text, hypertext). The tests will additionally measure the different executive functions and verbal ability. Teachers can use these tests to specify students’ text comprehension level and according to these results teachers can choose appropriate teaching strategies to support students’ comprehension skills. The results of the doctoral thesis can be applied to compiling the national tests in Estonian language, working out the national curricula and teachers’ training programs, as well as teaching practices. Better understanding of the students’ exact needs in text comprehension development would probably enhance students’ higher level text comprehension skills and the results of the national tests as well as international PISA tests.

10. Doctoral thesis project (up to 4000 characters with spaces):

It is important that in the first stage of basic school students acquire, besides the basic reading skills, the competence to retrieve and use the information from the text (Gleason & Ratner, 2009; Põhikooli riiklik õppekava, 2011). Most of reading theorists would agree that while comprehending texts the readers are combining lower and higher level cognitive skills (Applegate, Quinn, & Applegate, 2002). Despite this fact, many teachers and developers of the national tests still measure comprehension by how well students recall the details of the text (Allington, 2001, see also Üleriigiline tasemetöö, 2013; Üleriigiline tasemetöö, 2014). When comparing the reading tasks of the international survey of PISA (Programme for International Student Assessment) and Estonian national tests, it occurs that PISA measures mostly students’ higher level comprehension whereas Estonian national tests assess students’ ability to answer the questions related to the factual information included in the text. According to the results of PISA 2012, only 8% of Estonian students had mastered the highest level of text comprehension (Tire et al., 2013).
One of the reason might be that the higher level text comprehension skills (e.g. analyzing the texts, integrating new information with prior knowledge) are related to the readers’ verbal ability and processes of different executive functions, e.g. attention, working memory, planning, inhibition and shifting (Cartwright, 2012; Seigneuric & Ehrlich, 2005). Another reason might be the choice of the teachers’ instruction strategies for supporting the students’ comprehension skills. While supporting the lower level skills (e.g. decoding speed and accuracy), the traditional strategies are more suitable (Mayer, 2002; Slavich & Zimbardo, 2012). However, in order to support the development of students’ text comprehension skills at higher cognitive level, constructivist strategies have found to be more appropriate (Entwistle, 1998). Since in text comprehension there are likewise important the EF, verbal ability, as well as appropriate instructional strategies, the current doctoral thesis will investigate students’ text comprehension and its change in combination with different components that influence comprehension. The intervention for training the students’ comprehension at different levels will be carried on with the doctoral thesis. Also, the impact of the different EF and verbal ability on the students’ comprehension skills will be investigated. Further, the teachers’ choices of the teaching strategies for supporting the text comprehension at different level will be analyzed.

The aim of the doctoral thesis
The aim of the doctoral thesis is to evaluate students’ text comprehension skills and the impact of the EF and verbal ability on these skills. Also, the correlation between the change of students’ comprehension skills and teachers’ choice of the instructional strategies will be analyzed.

The main hypotheses are following:
1. It is assumed that students’ lower-level text comprehension skills have better evolved than higher-level skills.
2. It is expected that students with better verbal ability and EF achieve better results in comprehension at different levels compared to coevals with poorer EF and verbal ability.
3. It is presumed that students whose higher-level cognitive processes are more supported have better results compared to students whose teachers give most attention to the lower-level processes. Additionally, the EF and verbal ability is being better supported while higher-level text comprehension skills are enhanced.
4. It is hypothesized that students who are being taught by teachers preferring the constructivist instructional methods achieve better results at text comprehension than those taught by teachers who prefer traditional methods.

Method
Sample and procedure
The students of the basic school and their teachers will be studied with the doctoral thesis longitudinally. Students aged 10–13 will be involved in the sample – it is the age when students’ development of the inference making and interpretation skills is the most intensive (Cain & Oakhill, 2012). The sample consists of approximately 500 students. The final sample consists of approximately 10 class set. Four groups will be formed to carry out the main study: three intervention groups and one control group. The training groups will be differentiated by the choice of texts (linear and hyper texts) and the instructional methods (e.g. cooperative methods, think-aloud, text structure instructions). The training period will be three months, at least three reading lessons at a week. The impact of the intervention will be measured with the same tests as
the first measure was carried out. Additional tests to control the durability of the intervention will be implemented after one year.

Additionally, teachers who are teaching the students being involved with this study will be questioned in the beginning of the Grade 5 in order to find out their choices of instructional strategies for supporting the text comprehension skills. Also, teachers whose students were in experiment groups will be interviewed at the end of the Grade 5 to find out teachers’ opinion about the intervention and whether they are going to use those strategies in future reading lessons.

**Measurements**

1. **Students’ study**

   The test to assess students’ basic skills in comprehension will be worked out with this doctoral thesis. This test is being used three times (before training, after the training and for assessing the duration of the training). The test has a combination of objective and open-ended questions to make it possible to gather more specific information about readers. This test will be sensitive enough to distinguish between those children who can remember text and those who can think about it (Applegate et al., 2002). Verbal ability and EF will be assessed with previously prepared measurements (Männamaa, Kikas, Peets, & Palu, 2012; Männamaa & Kikas 2010; Norton & Wolf, 2012).

2. **Teachers’ survey.** In order to investigate the teachers’ preference for instructional methods, the instructional method survey, which has worked out with previous studies, will be used (see Uibu, Kikas, & Tropp, 2010; Uibu & Männamaa, 2014). The interview to find out teachers’ opinion about the effectiveness of the intervention will be worked out with the doctoral thesis.

**Data analysis**

The mixed methods will be used in the study (Creswell & Plano Clark, 2011; Hesse-Biber, 2010; Plowright, 2011). In order to analyze students’ data, both, the variable, e.g. ANCOVA (Cohen, Manion, & Morrison, 2007), and person-oriented approaches, e.g. Configural Frequency Analysis CFA (Bergman, Magnusson, & El-Khoury, 2003; von Eye, 1990) are being used. The qualitative content analysis will be additionally conducted to analyze the teachers’ answers (Braun & Clarke, 2006). The SLEIPNER and SPSS Statistics will be used for analyzing the data.

11. Summary in Estonian

   **Title:** Teksti mõistmise tasemete hindamine ja nende arendamine õpetamisstrateegiate abil

   **Supervisors:** Krista Uibu, Mairi Männamaa

   **Annotation:**

tase, kuid õpilasi, kes olid omandanud kõrgeima taseme lugemisoskuse, oli ainult 8%. (Tire et al., 2013). Olukord ei ole erandlik, vaid sarnaneb paljude Euroopa maade tulemustega (vt Babić, 2015).

Doktoritöö eesmärk on hinnata õpilaste teksti mõistmise osaoskusi ning eksekutiivsete funktsioonide, verbaalse võimekuse ja õpetaja õpetamismeetodite mõju teksti mõistmise arengule päikese koolielus. Doktoriuuringus korraldatakse sekkumine, kus kontrollitakse erinevate tekstistüüpidate ja õpetamisstrateegiate mõju õpilaste teksti mõistmise osaoskustele ja nende muutusele. Doktoritöö tulemeks on tekstimõistmise mittetahulidest arvestavad standardiseeritud testid, millega saab mõõta erinevat liiki tekstide (nt lineaarne tekst, hüpertekst) mõistmist. Testide arvestamisel arvestatakse õpilaste erinevatate eksekutiivsete funktsioonide ja verbaalse võimekusega. Testide abil saavad õpetajad hinnata õpilaste teksti mõistmise osaosid ning vastavalt taasemal valida sobivaõiged strateegiad õpilaste teksti mõistmise arendamiseks. Doktoritöö tulemuses on abiks ja suuniseks päikese koolielus, riikliku õppekava ja õpetajadele koostajatele ning koolis töötavatele tegevõtjatele. Eeldatavasti toetab see Eesti õpilaste kõrgeimad tasemad teksti mõistmise ülesannete tooristuse kui ka riiklikud tasemetööde.

12. Summary in English
Title: Assessment of text comprehension levels and improving it via teaching strategies
Supervisors: Krista Uibu & Mairi Männamaa
Annotation:

Most reading theorist would agree that while comprehending the texts skilled readers are combining lower and higher-level cognitive skills (Applegate, Quinn, & Applegate, 2002). Despite this fact, many teachers and developers of the national tests still assess comprehension by how well students can answer the factual questions which develop students’ lower-level cognitive skills (Allington, 2001, see also Üleriigiline tasemetöö, 2013; Üleriigiline tasemetöö, 2014). According to the results of PISA 2012, Estonian students had very good basic skills in reading, but only 8% of them had mastered the highest text comprehension level (Tire et al., 2013). This situation is not exceptional but resembles the results of many European countries (see Babić, 2015).

The aim of the doctoral thesis is to assess students’ text comprehension skills and the impact of the executive functions, verbal ability, and teachers’ instructional strategies on the change of text comprehension at second stage of primary school. An intervention is being carried out in the frame of the doctoral thesis to control the impact of different type of texts and instructional strategies on the text comprehension skills and its change. As a result of the doctoral thesis, the standardized tests, which consider the complex interaction of systems of comprehension, will be formulated. These tests can be used to assess the comprehension of different types of texts (e.g. linear and hypertext). Students’ different executive functions and verbal ability will also be considered while developing the tests. Teachers can judge the levels of students’ comprehension and according to the results teachers can choose appropriate instructional strategies for supporting better student comprehension. The results of the doctoral thesis are helpful and act as a guideline for the developers of the Estonian national tests and curricula, as well as for the practitioners. Presumably, the doctoral thesis helps to achieve better results in higher-level text comprehension in PISA and national tests.