PISA 2009 – Lessons for Estonia

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Introduction

Jaak Aaviksoo, Minister of Education and Research

Once again we have a detailed overview about the knowledge and skills of Estonian students at the end of comprehensive education. It is a great pleasure to recognize that internationally Estonian students excel in their performance in reading literacy as well as in science and mathematics. In reading literacy Estonia ranks fifth in Europe, tenth among the OECD countries and thirteenth in the world.

Although the survey results indicate good student performance, we also learn about the bottlenecks of the Estonian education system. It is essential to notice those as students finishing the comprehensive school should have a solid foundation on which to build their future- make reasonable choices, participate in lifelong learning and contribute to the development of the state and society.

PISA survey sampling methodology guarantees that PISA student sample is representative of all the 15-year-old students in each participating country. Therefore the survey is a valuable resource that reveals the effectiveness of our education system. In brief, we know that in science we rank among the best performers in the world, in reading our girls outperform boys, students in Russian medium schools show lower results than their peers in Estonian medium schools and the performance variability between schools is quite big. The results since the last survey have slightly declined. In spite of the fact that we still rank highly with the amount of students who have acquired the baseline knowledge we cannot remain content with the small percentage of students who are able to solve more advanced higher level tasks. Estonia is below the OECD average with the percentage of students reaching higher proficiency levels, especially in reading literacy. From the future perspective it is highly important to note the role of high achievers as they will be the ones contributing to the development of the society and the state. OECD has recognized a strong link between the top performing students and the number of scientific research community as per 1000 inhabitants.

We are pleased to recognize that in Estonia there is a weak connection between the student achievement and socio economic background, marking strong equity of the system. Most 15-year-olds in Estonia are positively minded about their school and their teachers. They feel their teachers are caring, fair and interested in their success and wellbeing. If students experience positive school environment and understand that school has done a lot for their future, it is more likely that students themselves will contribute more to their personal success and development.

In conclusion it can be said that we have been on the right track by following the education promoting principles in the comprehensive school over the past two decades and they have justified themselves. PISA 2009 report places Estonia together with Finland, Canada, Japan, Norway, Iceland and Hong Kong among the best performing school systems where student performance is above OECD average and the socio economic background is below average.

I would like to thank teachers, school principals and everyone else who has contributed to developing strong foundation for our students. I would also like to thank students who took PISA assessment seriously and through their work helped to provide valuable information for the development of the country.

I. Overview of PISA

What is PISA?

PISA (Programme for International Student Assessment) is an international survey organized by OECD (Organization for Economic Cooperation and Development) and it assesses knowledge and skills of 15-year-old students in three domains: reading, mathematics and science (OECD, 2010c). PISA survey is conducted every three years and it was started in 2000.

Each survey assesses students in three domains with one domain being in the main focus. In PISA 2000 and 2009 reading literacy was the main domain, PISA 2003 focused on mathematics whereas PISA 2006 had science as the major domain. Estonia has participated in PISA 2006 and 2009; it is also taking part in PISA 2012 assessment.

Why is it important to participate in international surveys?

Participation in international surveys provides us with valuable information about the quality and effectiveness of the educational system in Estonia and gives a comparative international perspective. Continuous participation allows us to follow the trends in student achievement and see education supporting systems which in turn help to detect necessary changes and make improvements.

Why 15-year-olds?

In most countries students at the age of 15 are nearing the completion of compulsory education and this is the time when they have to make choices about their future career. PISA samples students who are 15 years and three months until 16 years and two months old at the time of assessment.

What does PISA assess?

The main objective of PISA survey is to assess the extent to which students near the end of compulsory education are ready to make choices, manage everyday situations, participate in society and are ready for lifelong learning. PISA assesses student ability to apply their knowledge and skills to real life situations which can be of personal, social or global nature. PISA uses the term "literacy" in order to stress the broader knowledge and skills that are needed to summarize the student abilities to apply their knowledge and skills to real life situations. For example, in reading literacy students work with different text formats and are assessed in their abilities to access and retrieve information, reflect and evaluate on what they have read, integrate and interpret texts, etc.

How is PISA data collected?

Students complete test booklets that according to PISA test design contain assessment material from all three assessment domains. Half of the test items are in the major domain, the other half for the two minor domains. All the test material is rotated between 13 booklets. Each unit in the test booklets consists of a unit stimulus which may be a text, diagram, table or figure - all based on real life situations. Each item requires a multiple choice, a brief answer or longer answer. Students have two hours to complete the test.

Students also complete a student questionnaire which asks questions about student background and their attitudes towards certain subjects (e.g. interest in reading). School principals of the participating schools are asked to complete a questionnaire about the school regarding the number of teaching staff, school autonomy, school resources, school management, etc.

How is the sample drawn for each country?

In order to guarantee the accuracy and comparability of the survey, the sample has to be of high quality. Most countries follow the two staged stratified sampling. The first stage involves sampling individual schools in which 15 year old students are enrolled, in the second stage 35 students from those schools

are sampled. For Estonia the implicit stratification variable is the language of instruction (Estonian or Russian). Also gender, urbanicity and school type is considered in order to get a representative sample. Strict directions are given as to which schools or students can be excluded from the sample. There is a set proportion of student population that has to be covered (Thomson, et al. 2010).

In order to guarantee the reliability of the survey, each country has to follow stringent sampling procedures. The school sample for each country is drawn by PISA consortium, school participation rate has to be 85% (100% of the schools in Estonia participated) whereas the student participation rate should not be below 85% (it was 94, 06% for Estonia). From the sampled students 5% can be accounted as non participants (it was 3, 81% in Estonia).

How many students and schools participate in PISA?

In PISA 2006 more than 400 000 students from 57 countries participated in the survey. Estonia was represented by 4865 students from 169 schools. In PISA 2009 there were 65 participating countries with around 470 000 students. Estonian sample consisted of 4727 students (2297 girls and 2430 boys; 3841 students did the test in Estonian, 886 in Russian) which was a representative sample of more than 14 000 15-year olds in Estonia.

In PISA 2009 175 schools participated in the survey out of which 138 were Estonian medium schools, 31 were Russian medium schools and 6 mixed language schools. Students with special education needs able to participate also completed the test. SEN students following the reduced difficulty state curriculum did not participate.

98, 2% of sampled students studied in comprehensive or upper secondary schools, 1, 8% of students were from vocational schools (Tire, et al. 2010).

Why should students make an effort while completing PISA test?

Each sampled student in PISA survey represents a certain number of "similar" students from the Estonian student population. This means that each student represents other students as well as the whole country. The sampled students have a chance to represent their country and our sincere hope is that they feel selected and proud in this task to do their best. It is very important to know how all students in Estonia are doing: high achievers and low achievers, Estonian and other language speakers, girls and boys, students from the city and from the country. If we know the student distribution according to different proficiency levels and their results on different proficiency scales, it is possible to set and implement means in the educational system to raise the student performance.

II. PISA 2009 results

Student performance based on mean scores

If PISA 2006 focused on science, then in PISA 2009 the main focus was on reading literacy. According to the mean scores Estonia showed good results in the international comparison ranking 13th in the world, 10th among the OECD countries and 5th in Europe (see table 1). There were nine countries/economies that performed significantly better than Estonia: Shanghai-China, Korea, Finland, Hong Kong-China, Singapore, Canada, New Zealand, Japan and Australia. Estonia showed similar results to the Netherlands, Belgium, Norway, Poland, Iceland, USA, Liechtenstein, Sweden, Germany, Ireland, France, Chinese Taipei, Denmark, United Kingdom and Hungary (OECD, 2010c). Estonia ranked 17th in mathematics (7th in Europe) and 9th in science (2nd in Europe). Therefore Estonian students are the most successful in science and least in mathematics.

Student performance according to proficiency levels

The tasks used in PISA can be divided in six levels of difficulty. Each level corresponds to a proficiency level and shows the proportion of students who managed to solve the tasks of the particular level. The higher the level, the more difficult the tasks. The lowest level 1 was divided into two levels 1a and 1b that way providing more detailed information about student abilities to the countries that have many low performing students.

It is important to keep in mind that second proficiency level is considered to be the baseline level that is needed for young people to manage in their everyday life. However, OECD has stressed that the third proficiency level could be the baseline level for the students in the developed countries.

Canada has followed up the career paths for students from PISA 2000. The research results show that students who did not reach the second proficiency level in PISA in their adult lives belong to low income or risk groups who do not study, are unemployed, etc. On the other hand students who reached proficiency levels five and six continue their studies or have obtained better income jobs. It is important to note that in the future career choices there is much stronger connection between the PISA results than year grades of the students (OECD, 2010a).

The distribution of students according to the proficiency levels is essential for the future development of the society. In any case the students from fifth and sixth proficiency levels are the ones who will contribute to the development of the country. On the other hand those young people who have not reached the baseline proficiency level are more likely to join risk groups and be unable to manage their lives. Therefore serious attention should be granted to the distribution of students at the different proficiency levels.

Table 2 gives the description of tasks that correspond to the six proficiency levels. It also shows the OECD and Estonian percentages of students at each proficiency level. In addition the student distributions from the neighbouring countries of Finland and Russia are added. These countries are chosen as both of them are our neighbours; Finland has been an example in the educational reform processes in Estonia over the past twenty years. We look at Russia in order to compare the results of students from the Russian medium schools in Estonia with their counterparts in Russia.

Estonian students in the international comparison have positioned themselves well according to the baseline proficiency level. We are seventh in the world, second in Europe (after Finland), tenth in mathematics (third in Europe) and fifth in science (second in Europe).

The percentage of Estonian students reaching the highest levels of proficiency is quite modest. In reading literacy the percentage of students at fifth and sixth proficiency levels is below the OECD average (see table 3, figure 1). In OECD countries 6, 8% of students reach level 5, in Estonia it is 5,4%. Sixth proficiency level is reached by 0, 8% students in OECD countries, it is 0, 65% in Estonia.

Table 1. PISA 2009 results based on mean scores

Statistically significantly above the OECD average	Not statistically significantly different from OECD average	Statistically significantly below the OECD average

Reading literacy		Mathematical literacy		Scientific literacy	
Country	**Mean score**	**Country**	**Mean score**	**Country**	**Mean score**
Shanghai-China	556	Shanghai-China	600	Shanghai-China	575
Korea	539	Singapore	526	Finland	554
Finland	536	Hong Kong	555	Hong Kong	549
Hong Kong	533	Korea	546	Singapore	542
Singapore	526	Chinese Taipei	543	Japan	539
Canada	524	Finland	541	Korea	539
New Zealand	521	Liechtenstein	536	New Zealand	538
Japan	520	Switzerland	534	Canada	532
Australia	515	Japan	529	**Estonia**	**529**
Netherlands	508	Canada	527	Australia	528
Belgium	506	Netherlands	526	Netherlands	527
Norway	503	Macao-China	525	Chinese Taipei	522
Estonia	**501**	New Zealand	519	Germany	520
Switzerland	501	Belgium	515	Liechtenstein	520
Poland	500	Australia	514	Switzerland	517
Iceland	500	Germany	513	United Kingdom	514
USA	500	**Estonia**	**512**	Slovenia	512
Liechtenstein	499	Iceland	507	Macao-China	511
Sweden	497	Denmark	503	Poland	508
Germany	497	Slovenia	501	Ireland	508
Ireland	496	Norway	498	Belgium	507
France	496	France	497	Hungary	503
Chinese Taipei	495	Slovak Republic	497	USA	502
Denmark	495	Austria	496	Czech Republic	500
United Kingdom	494	Poland	495	Norway	500
Hungary	494	Sweden	494	Denmark	499
Portugal	489	Czech Republic	493	France	498
Macao-China	487	United Kingdom	492	Iceland	496
Italy	486	Hungary	490	Sweden	495
Latvia	484	Luxembourg	489	Austria	494

Reading literacy		Mathematical literacy		Scientific literacy	
Slovenia	483	USA	487	Latvia	494
Greece	483	Ireland	487	Portugal	493
Spain	481	Portugal	487	Lithuania	491
Czech Republic	478	Spain	483	Slovak Republic	490
Slovak Republic	477	Italy	483	Italy	489
Croatia	476	Latvia	482	Spain	488
Israel	474	Lithuania	477	Croatia	486
Luxembourg	472	Russia	468	Luxembourg	487
Austria	470	Greece	466	Russia	478
Lithuania	468	Croatia	460	Greece	470
Turkey	464	Dubai	453	Dubai	466
Dubai	459	Israel	447	Israel	455
Russia	459	Turkey	445	Turkey	454
Chile	449	Serbia	442	Chile	447
Serbia	442	Azerbaijan	431	Serbia	443
Bulgaria	429	Bulgaria	428	Bulgaria	439
Uruguay	426	Rumania	427	Rumania	428
Mexico	425	Uruguay	427	Uruguay	427
Rumania	424	Chile	421	Thailand	425
Thailand	421	Thailand	419	Mexico	416
Trinidad and Tobago	416	Mexico	419	Jordanian	415
Colombia	413	Trinidad and Tobago	414	Trinidad and Tobago	410
Brazil	412	Kazakhstan	405	Brazil	405
Montenegro	408	Montenegro	403	Colombia	402
Jordan	405	Argentina	388	Montenegro	401
Tunisia	404	Jordan	387	Argentina	401
Indonesia	402	Brazil	386	Tunisia	401
Argentina	398	Colombia	381	Kazakhstan	400
Kazakhstan	390	Albania	377	Albania	391
Albania	385	Tunisia	371	Indonesia	383
Qatar	372	Indonesia	371	Qatar	379
Panama	371	Qatar	368	Panama	376
Peru	370	Peru	365	Azerbaijan	373
Azerbaijan	362	Panama	360	Peru	369
Kyrgyzstan	314	Kyrgyzstan	331	Kyrgyzstan	330

Source: OECD, 2010c.

Table 2. Summary descriptions for the seven proficiency levels in reading literacy and the percentage of students able to perform tasks at each level

Level	Lower score point	Percentage of students able to perform tasks at each level	Characteristics of tasks
6	698	OECD: 0, 8% Estonia: 0,6% Finland: 1,6% Russia: 0,3%	Tasks at this level require the reader to make multiple inferences, comparisons and contrasts that are both detailed and precise. They require demonstration of a full and detailed understanding of one or more texts and may involve integrating information from more than one text. Tasks may require to deal with unfamiliar ideas, in the presence of prominent competing information, and to generate abstract categories for interpretations. *Reflect and evaluate* tasks may require to hypothesise about or critically evaluate a complex text on an unfamiliar topic, taking into account multiple criteria or perspectives, and applying sophisticated understandings from beyond the text. A salient condition for *access and retrieve* tasks at the level is precision of analysis and fine attention to detail that is inconspicuous in the texts.
5	626	OECD: 6, 8% Estonia: 5,4% Finland: 12,9% Russia: 2,8%	Tasks at this level that involve retrieving information require the reader to locate and organise several pieces of deeply embedded information, inferring which information in the text is relevant. Reflective tasks require critical evaluation or hypothesis, drawing on specialised knowledge. Both interpretative and reflective tasks require a full and detailed understanding of a text whose content or form is unfamiliar. For all aspects of reading, tasks at this level typically involve dealing with concepts that are contrary to expectations.
4	553	OECD: 20, 7% Estonia: 21,2% Finland: 30,6% Russia: 11,1%	Tasks at this level that involve retrieving information require the reader to locate and organise several pieces of embedded information. Some tasks at this level require interpreting the meaning of nuances of language in a section of text by taking into account the text as a whole. Other interpretative tasks require understanding and applying categories in an unfamiliar context. Reflective tasks at this level require readers to use formal or public knowledge to hypothesise about or critically evaluate a text. Readers must demonstrate an accurate understanding of long or complex texts whose content or form may be unfamiliar.
3	480	OECD: 28, 9% Estonia: 33,8% Finland: 30,1% Russia: 26,8%	Tasks at this level require the reader to locate, and in some cases recognise the relationship between, several pieces of information that must meet multiple conditions. Interpretative tasks at this level require the reader to integrate several parts of a text in order to identify a main idea, understand a relationship or construe the meaning of a word or phrase. They need to take into account many features in comparing, contrasting or categorising. Often the required information is not prominent or there is much competing information; or there are other obstacles in the text, such as ideas that are contrary to expectation or negatively worded. Reflective tasks may require connections, comparisons, and explanations, or they may require the reader to evaluate a feature of a text. Some reflective tasks require readers to demonstrate a fine understanding of the text in relation to familiar, everyday knowledge. Other tasks do not require detailed text comprehension but require the reader to draw on less common knowledge.

Level	Lower score point	Percentage of students able to perform tasks at each level	Characteristics of tasks
2	407	OECD: 24, 0% Estonia: 25,6% Finland: 16,7% Russia: 31,6%	Some tasks at this level require the reader to locate one or more pieces of information, which may need to be inferred and may need to meet several conditions. Others require recognising the main idea in a text, understanding relationships, or construing meaning within a limited part of the text when the information is not prominent and the reader must make low level inferences. Tasks at this level may involve comparisons or contrasts based on a single feature in the text. Typically reflective tasks at this level require readers to make a comparison or several connections between the text and outside knowledge, by drawing on personal experience and attitudes.
1a	335	OECD: 13, 1% Estonia: 10,6% Finland: 6,4% Russia: 19,0%	Tasks at this level require the reader: to locate one or more independent pieces of explicitly stated information; to recognise the main theme or author's purpose in a text about a familiar topic; or to make a simple connection between information in the text and common, everyday knowledge. Typically the required information in the text is prominent and there is little, if any, competing information. The reader is explicitly directed to consider relevant factors in the task and in the text.
1b	262	OECD: 4, 6% Estonia: 2,4% Finland: 1,5% Russia: 6,8%	Tasks at this level require the reader to locate a single piece of explicitly stated information in a prominent position in a short, syntactically simple text with a familiar context and text type, such as a narrative or simple list. The text typically provides support to the reader, such as repetition of information, pictures or familiar symbols. There is minimal competing information. In tasks requiring interpretation the reader may need to make simple connections between adjacent pieces of information.
Below 1b	Below 262	OECD: 1, 1% Estonia: 0,3% Finland: 0,2% Russia: 1,6%	

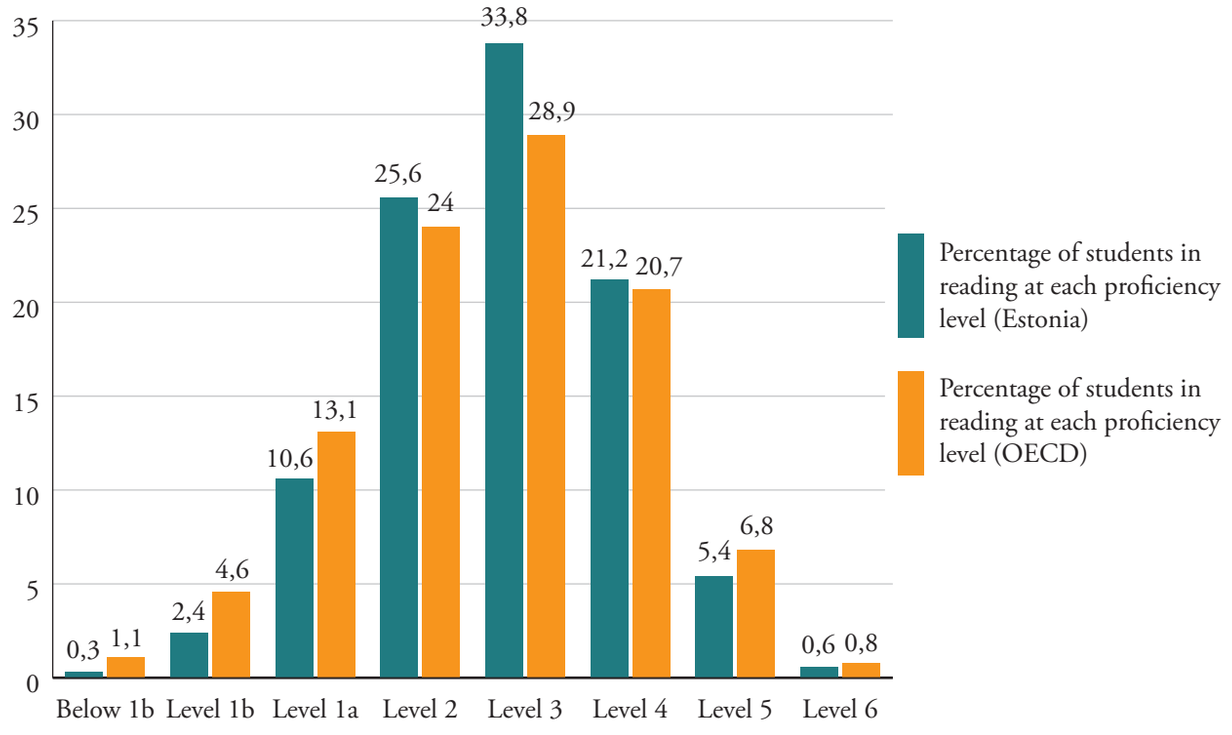
Source: OECD, 2010c

Table 3. Percentage of students in highest and lowest proficiency levels.

Domain	Percentage of students in OECD countries		Percentage of students in Estonia	
	5. level	**6. level**	**5. level**	**6. level**
Reading literacy	6,8	0,8	5,4	0,65
Mathematical literacy	9,6	3,1	9,8	2,2
Scientific literacy	7,4	1,1	9,0	1,4
	below 2	**below 3**	**below 2**	**below 3**
Reading literacy	18,8	42,8	13,3	38,9
Mathematical literacy	22	44	12,6	35,3
Scientific literacy	18	42,4	8,3	29,6

Attention should be paid to the fact that 13,3% of students in Estonia did not reach level 2, whereas 38,9% did not reach level 3 which is considered to be the baseline level of proficiency in developed countries.

Figure 1. Distribution of students according to the proficiency levels



Results in reading literacy

PISA 2009 defines reading literacy as follows:

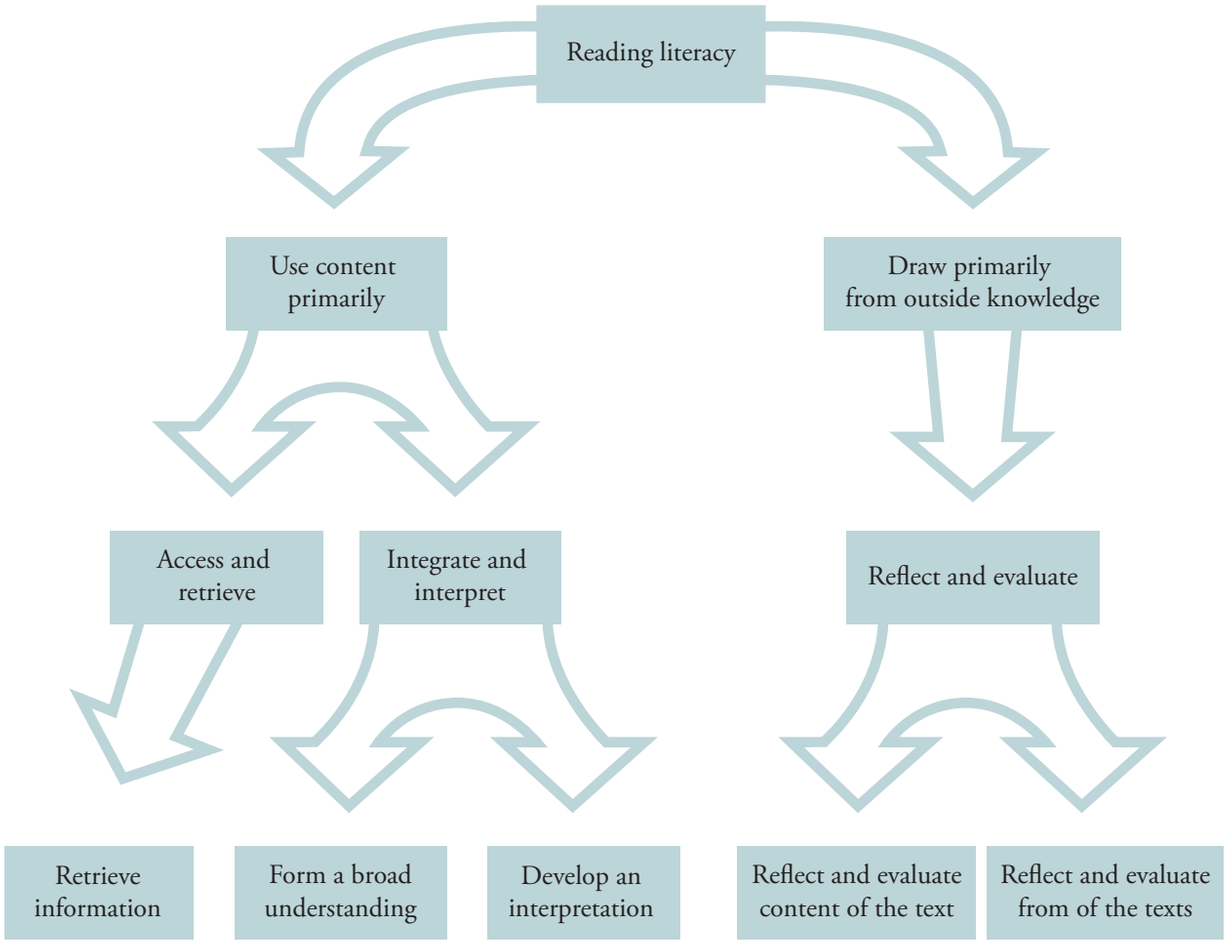
> Reading literacy is understanding, using, reflecting on and engaging with written texts, in order to achieve one's goals, to develop one's knowledge and potential, and to participate in society.

Reading literacy tasks were divided between four situational categories: personal (28%), educational (28%), occupational (16%) and public (28%). Five aspects guided the development of reading literacy tasks: retrieving information, forming a broad understanding, developing an interpretation, reflecting on and evaluating on the content of a text, reflecting on and evaluating on the form of the text. As it was not possible to include sufficient items in the PISA assessment to report on each of the five aspects as a separate subscale, for reporting on reading literacy these five aspects were organised into three broad aspect categories:

- *Access and retrieve* information in the text
- *Integrate and interpret* what was read
- *Reflect and evaluate* standing back from a text and relating it to personal experience (OECD(c), 2010).

Another important classification of texts which is also at the heart of the assessment framework for PISA 2009 is the distinction between continuous and non continuous texts. Texts in continuous and non-continuous format appear in both the print and electronic media. Continuous texts are formed of

Figure 1. Relationship between reading framework and the aspect subscales



Source: Reading Literacy framework, 2007

sentences organised into paragraphs. Examples of texts in continuous text format in the print medium include newspaper reports, essays, novels, short stories, reviews and letters. Non-continuous texts can be shown as different lists. Examples of non-continuous text objects are lists, tables, graphs, diagrams, advertisements, schedules, catalogues, indexes and forms (Kirsch et al, 1990).

The distribution of Estonian students at each proficiency level in the three subscales (access and retrieve, integrate and interpret, reflect and evaluate) has been presented in table 4. The table also shows the results for Russia, Finland and Shanghai, the best performer of PISA 2009.

When looking at the student distribution according to the proficiency levels in all three domains for Estonia, Finland, Shanghai and Russia, it can be noticed that the biggest proportion of Estonian students reached the third proficiency level whereas in Finland and Shanghai the majority of the students were able to reach fourth proficiency level. The majority of students in Russia were able to reach second level of proficiency (Tire, et al, 2010).

It is important to point out that almost one fifth (18, 9%) of the Estonian boys dis not reach the baseline (second) level of proficiency. In Finland the same number is 12, 9% whereas in Shanghai it is only 6, 6% of boys not reaching the baseline proficiency level. With such result Estonia ranks seventh in the world and second in Europe. However, special attention needs to be paid to boys with poor reading skills.

Comparison of the student distribution of the abovementioned countries at the highest proficiency levels (4 to 6) shows that in Shanghai China more than 50% of the students have reach at least fourth

proficiency level in all assessment domains. In Finland it is around 45% and in Estonia around 30% (slightly less on *reflect and evaluate* and *integrate and interpret* subscales). The amount of students reaching the highest proficiency levels prompt that educational system in Shanghai China has effectively managed to develop student potential. Around one fifth of students there have reached proficiency levels 5 and 6 in all reading subscales. On *integrate and interpret* subscale the corresponding proportion of Estonian students is 6,2%; on *reflect and valuate* subscale it is 6,8% and on *access and retrieve* it is 8,4% of students. In Finland these numbers are two times higher: 15, 8 % (*integrate and interpret*), 14, 6% (*reflect and evaluate*), 17, 3% (*access and retrieve*).

More thought should be given to the fact that according to student proportions reaching fifth and sixth proficiency levels we rank 24th in the world and 14th in Europe.

When looking at the results of Estonian students in the subscales of continuous and non-continuous texts, it can be noticed that our students are better at handling non-continues texts. On non-continuous text subscale Estonian students rank 11th in the world and 3rd in Europe and the mean score in this subscale is significantly higher than the OECD average. At the same time on the continuous text subscale the mean score does not differ significantly from the OECD mean (in the general ranking Estonia here is 18th in the world and 9th in Europe). It is important to note that performance difference between boys and girls in non-continuous texts is smaller than in continuous texts.

Student performance in reading shows a clear association between performance and student attitudes towards reading. Students who enjoy reading as a rule perform better. The enjoyment of reading for Estonian students in general is below the OECD average ranking 45th among the 65 countries. In Estonia as well as the Netherlands, Latvia, Lithuania, Poland, Portugal, Germany, Slovenia and Finland

Table 4. Distribution of Estonian students according to proficiency levels in three reading subscales

Countries	Below Level 1.b	Level 1.b	Level 1.a	Level 2	Level 3	Level 4	Level 5	Level 6
Access and retrieve								
Estonia	0,6	3,3	11,4	23,5	**31,0**	21,7	7,5	0,9
Finland	0,8	2,5	7,8	17,2	27,0	**27,4**	14,2	3,1
Russia	2,6	6,8	16,9	**27,7**	25,8	14,0	5,0	1,1
Shanghai	0,5	1,5	5,7	14,8	26,1	**29,5**	17,3	4,6
Integrate and interpret								
Estonia	0,2	2,4	11,6	25,4	**33,2**	20,9	5,6	0,6
Finland	0,2	1,3	6,3	16,8	29,7	**30,0**	13,6	2,2
Russia	1,2	6,0	17,9	**31,0**	27,0	13,0	3,6	0,4
Shanghai	0,0	0,5	3,4	13,3	28,3	**33,2**	18,0	3,1
Reflect and evaluate								
Estonia	0,4	2,7	10,4	25,3	**32,4**	21,9	6,1	0,7
Finland	0,4	1,3	6,3	16,9	**30,5**	30,0	12,8	1,8
Russia	3,6	10,1	22,1	**29,7**	22,5	9,5	2,2	0,3
Shanghai	0,2	0,6	4,2	13,2	27,6	**32,9**	17,9	3,4

Source: OECD, 2010c

the difference in reading enjoyment between boys and girls was the biggest. Estonian students show little enjoyment in reading fiction, however, they are more active in reading newspapers.

It can also be noted that Estonian students are very active on-line readers. For example, in on-line news reading category they ranked third after Poland and Korea. Interestingly that in digital reading boys are more active readers than girls. Estonian boys are the most active in participating in online group discussions or forums (like MSN) taking the first place in the world.

In the conclusion, we can suggest that in order to improve the reading skills of Estonian students much attention should be paid to developing their interest towards reading, especially fiction. Special attention should be paid to the reading skills of boys. More work needs to be done to foster their interest and motivation towards reading as well as developing their reading potential.

The student interest in reading in on-line environment should be captured and used in developing their reading motivation and skills in general.

III. PISA – chance to learn from other countries

One of the goals of PISA is to point out the characteristics of successful school systems and allow others to learn from those. Although every country has its own historic, economic and social system, in the process of educational reforms it is it possible to learn from practices of other countries.

After PISA 2009, the United States took a closer look at educational policies and strategies of several successful school systems. Those are compiled in a publication *„Strong Performers and Successful Reformers in Education. Lessons from PISA for the United States"* with the descriptions of possible contributors to the success of those selected systems (OECD, 2011b). Table 4 provides an overview of practices of the selected systems and ideas that might contribute to their success.

Although countries differ in ways their educational systems function, all of the described systems share one common feature- they value every child and the learning process is arranged accordingly to support and promote the maximum of each child's potential.

Table 5. Approaches of Canada, Hong Kong, Shanghai, Japan, Singapore, Finland and Germany in order to improve the efficiency of their school systems

Canada

Culturally

- Parents support their children
- Students read a lot in their spare time
- High level of well-being in the country
- Every citizen has the right to medical and social care. Education is not a privilege but a guaranteed right
- Teachers feel that it is their responsibility to provide each student according to his/her ability with the best possible education

Politically

- Ability to create curricula in each province based on common goals and values of the entire country

Finland

- Long established comprehensive school tradition
- Children have equal opportunities to develop their potential and all children are expected to achieve at high levels
- System provides broad, rich curriculum to all students and does not concentrate on teaching just 2-3 subjects
- Attention towards teacher and principal quality. Teaching is a highly desired occupation; schools have bigger autonomy than

Hongkong

- Reforms have made it possible to change the traditional ways of thinking (education for everyone, emphasis on learning instead of teaching, moving from fact memorization to development of learning and from economic needs to individual needs)
- Preference to more fundamental, system enhancing reforms to superficial improvements
- Hong Kong and Shanghai- different examples of centralization and de-centralization. In Hong Kong government organ administers more than 1000 schools, in Shanghai municipal governments retain policy making and co-ordinating activities
- National examinations- a positive learning support
- Accountability is part of professional responsibilities and not seen as separate machinery to assure quality. It is not about procedures and indicators

Japan

- Shared belief that education is the key to the country's future
- Consistent international benchmarking
- High student motivation is part of Japanese culture, with the belief that academic

in other countries. Teacher salaries are in the middle range for European countries. There is no external evaluation. Principals and teachers are responsible for their work. Schools are mostly a function of municipal government. Relatively small school and classroom size. Virtually all of the money spent on education is focused on schools and classrooms
- Teachers are trained to identify children with difficulty and intervene according to the needs of the child. Every school has a trained intervention specialist who helps the classroom teacher to work with struggling children. Supporting children with difficulty is a shared responsibility of all teachers
- Education system has developed in close alignment with Finland's economy and social structure
- The education system cultivates young people who are innovative, entrepreneurial, risk-taking and able to apply their knowledge in the knowledge based economy

Germany

- Serious attention paid to teacher training (e.g. mentoring by master teachers)
- Importance of dual system- school leavers as future work force need certain skills, such as ability to set work goals and in a disciplined way to execute them, need to participate in a team work and work independently
- Students are aware that formal qualifications they earn will have an impact on their future career, therefore students are motivated to gain knowledge and skills that will help them to enter labour market
- Germany- became a determined international benchmarker after the modest results in PISA 2000. Intensive learning from other educational systems in the world

achievement is more a matter of effort than natural (genetically-endowed) ability
- The national curriculum is coherent, carefully focused on core topics and set at a very high level of cognitive challenge
- Japanese teachers believe that in some subjects student performance is better with bigger classes. This is because more students are likely to come up with a wider range of problem solving strategies from which other students can learn and create discussions
- High expectations for students of all abilities
- Spend more on teachers (salaries) and less on school buildings and glossy textbooks
- Effective professional development of teachers guarantees continuous improvement of teaching practices

Singapore

- Advantage of a small country- efficient educational system
- Stability of the system is preferred to constant changes
- Strong link between education and economic development has made education policies highly pragmatic
- Clear goals and rigorous standards; focus on high level, complex skills
- High motivation to teach and to learn (salary bonuses, awards)
- Global outlook that encourages students, teachers and principals be „future ready". Focused on using International benchmarking

Source: OECD, 2011b

IV. Policy and teacher training implications

After PISA 2009 OECD has published a number of detailed publications about different aspects of school systems and their governance, student equity, attitudes, learning times, etc. Consulting firm McKinsey&Company has conducted several surveys in order to find out the reasons and explanations of a successful school system. In the following paragraphs we have tried to point out several interesting results and conclusions from the Estonian point of view.

Country sample specific characteristics

Looking at the sample specific characteristics of successful school systems only Finland and Estonia differ with the fact that most of the students start school at the age of 7 and were in grade 9 at the time of PISA assessment. Table 5 shows the distribution of students according to grades in those countries that show better reading performance than Estonia. In most of the systems children start school a year earlier (table 5). That leads to an assumption about the effectiveness of Estonian school system, as students have gained similar knowledge in nine years whereas their peers in other countries have had one more year of schooling. At the same time this might suggest about increased study load that students in Estonia have to cope with.

Learning time at school and outside school (based on PISA 2006)

PISA 2006 explored student study time at school as well as outside school. The country comparison consists of the number of lessons students receive at school and number of hours devoted to the subjects outside school time (enrichment and remedial lessons, etc) as well as private tutoring and homework. Briefly, the following points can be brought out:

- Across countries, the country average of learning time in regular school lessons is positively, but weakly, related to country average performance, while learning time in out of school time lessons and individual study is negatively related to performance. Therefore efforts should be geared at raising the effectiveness of teaching and learning in the school lessons as those seem to contribute most to the performance of students;
- Across countries, the findings show that students perform better if the total learning time (regular, out-of-school time lessons, private tutoring, etc) is dedicated to regular school lessons.
- If a country wants to improve its performance in science, it should encourage and motivate especially male students, students from rural schools and students from socio-economically disadvantaged backgrounds to spend more time learning science in regular school lessons.
- When students believe that doing well in science is very important, spending more time learning science in regular school lessons is an efficient way of improving their performance. (OECD, 2011c).

Homework is given to students in all countries although time spent on homework differs across countries. Table 7 shows comparison of home work times in those countries where the student performance in math in PISA 2006 was higher than in Estonia.

Students in Estonia spend less or similar amount of time on homework than students in better performing countries. If we compare the groups of students who claim to spend more than four hours per day on maths homework, then there are four countries where the percentage of students in this category is higher than in Estonia (Hong Kong, Korea, Germany and Macao-China). In the next group of students that claim to spend 6 and more hours on maths homework per week there are six countries with higher percentages of such students than in Estonia- (Germany, Macao-China, Canada, Korea, Hong Kong and Taipei). It can be concluded that in Asian countries students do more homework than in the rest of the world. At the same time it can be noted that in Finland, where student

performance is higher than in Estonia, the amount of time spent on homework weekly is considerably smaller. Therefore the reasons for better student performance could be found in more effective lessons. Especially if the number of lessons for the corresponding age group in Finland is smaller than in Estonia (58% of Finnish students responded that they have two to four maths lessons per week, in Estonia similar response was given by 21,8% of students. 28,9% of students in Finland answered that they have four to six maths lessons per week. In Estonia 55, 3% of students claimed that).

Classification of education systems based on performance in international assessments

Based on student performance in PISA and other internationals assessments McKinsey&Company conducted a study *„How the World's Most Improved School Systems Keep Getting Better?"*. McKinsey created a universal scale from the different assessments (since 1997 until 2007) which made it able to classify different school systems as poor, fair, good, great and excellent (Table 7).

In order to improve the educational system, the McKinsey report suggests the following interventions that should work for all:

1. revising curriculum and standards;
2. revising reward and remuneration structure;
3. building technical skills of teachers and principals;
4. assessing student learning;
5. using student data to guide delivery;
6. establishing policy documents and education laws.

The report also describes countries that have reached different levels and their focus points in educational policy and arrangements in order to increase the performance level of the system (Appendix 1 and 2).

Table 6. Student distribution according to grades in countries with higher reading performance than Estonia

Top performers in reading	Distribution of students according to grade				
	Grade 7	**Grade 8**	**Grade 9**	**Grade 10**	**Grade 11**
Shanghai-China	1	4,1	37,4	**57,1**	0,4
Korea	0	0	4,2	**95,1**	0,7
Finland	0,5	11,8	**87,3**	0	0,4
Hong Kong-China	1,7	7,2	25,2	**65,9**	0,1
Singapore	1	2,6	34,7	**61,6**	0
Canada	0	1,2	13,6	**84,1**	1,1
New Zealand	0	0	0	5,9	**88,8**
Japan					
Australia	0	0,1	10,4	**70,8**	18,6
Netherlands	0,2	2,7	46,2	**50,5**	0,5
Belgium	0,4	5,5	32	**60,8**	1,2
Norway	0	0	0,5	**99,3**	0,2
Estonia	1,6	24	**72,4**	1,8	0,1

Source: OECD, 2011a

Table 7. Time spent on homework (based on PISA 2006) in countries that performed better in maths than Estonia

	Do not spend time on homework	Less than 2 hours per week	More than 2, but less than 4 hours per week	More than 4 but less than 6 hours per week	6 and more hours per week
Shanghai-China	Did not participate in PISA 2006				
Singapore					
Hong Kong-China	12	42,4	28,8	11,3	5,5
Korea	16,5	37,3	27,5	10	8,8
Chinese Taipei	18,8	42,1	28,1	7,6	3,3
Finland	15,3	68,9	13,9	1,6	0,2
Liechtenstein	9,1	65,7	21,7	3,3	0,3
Switzerland	8,4	60,1	25,8	4,5	1,3
Japan	25,4	48,2	18,8	4,9	2,7
Canada	15,9	44,4	26,7	9,4	3,7
Netherlands	16,7	56,8	22	3,7	0,9
Macao-China	14,7	44,6	25,7	9,9	5,1
New Zealand	15,8	55,5	21,8	5,1	1,7
Belgium	13,8	49,8	28,2	6,3	1,8
Australia	13,2	51,7	26	6,9	2,1
Germany	6,3	44,8	34,5	10,7	3,6
Mean of the above 13 countries	14,61	51,53	24,67	6,45	2,73
Estonia	14,9	45,3	27,3	9,4	3,1

Source: OECD, 2011c

Table 8. Classification of education systems based on performance in International assessments

Level	Points	Focus points	Examples
Excellent	More than 560		Finland (561)
Great	520–560	**Learning through peers and innovation**	Korea, Singapore, **Estonia,** Ontario, Australia, etc
Good	480–520	**Shaping the professional** (recruiting programs, in service training, certification, self evaluation, data systems, etc.)	USA, Germany, United Kingdom, Poland, Latvia, etc.
Fair	440–480	**Getting the system foundations in place** (accountability, school inspections, optimization of number of schools and teachers, organizational restructuring, school models, etc)	Armenia, Chile etc.
Poor	Below 440	**Achieving basic literacy and numeracy**	Ghana, Brazil, etc

Source: Mourshed, 2010

Estonia is placed in the „great“ level together with Korea, Singapore, Australia, etc. Finland is so much different from the others that the report talks about it separately (Mourshed, et al, 2010).

The report notes that in school systems that qualify as „great“ a lot of attention is paid to learning through peers and innovation. Appendixes two and three provide more detail on interventions by countries that qualify as „good“ and „great“. Knowing that performance variability between schools in Estonia is quite big, the educational policy makers should be aware of that and consider the different performance levels between schools when creating and implementing school support systems. There are schools in Estonia where almost 50% of the students do not reach the baseline level in reading, maths and science; and where mean scores in all domains are below 440 points. That suggests that these schools in their activities differ from those schools in Estonia where students reach high levels of performance. It is important to note that the higher the level of the education system, the smaller is the role of accounting and inspection (Barber, 2011).

Importance of school leadership

Barber and Mourshed claim that the factor most influencing the improvements in student performance is classroom teaching (Barber et al., 2007). Quality of school leadership is second to classroom teaching that has an influence on pupil learning (Leithwood et al., 2004). Different studies confirm that school leaders influence student performance by building visions and setting directions of the school as an organization, developing its personnel, restructuring the organization, improving teaching and learning conditions that foster good performance and behaviour. Research also shows that school principals contribute more to student progress if they have more autonomy and freedom to decide personnel, curriculum and other school governance issues (Leithwood et al., 2006a; Leithwood et al., 2006b).

In the international comparison Estonian school leaders have rather big independence when deciding on different school management matters, including hiring and firing of personnel, etc. However, the big performance variability between schools suggests that possibly not all school principals use entirely their skills and rights to increase the student outcomes of their school.

Research shows that performance level of an educational establishment never exceeds its quality and leadership. If it is assumed that 60% of the variance explaining student achievement can be attributed to school, then 33% from that is explained by teachers work in the classroom and 25% to the school leadership. School leadership is one of the strongest factors contributing to teaching improvement. Different levels of the education system have different tasks. The task of the teacher is to teach, cooperate with other teachers and implement the best practices as well as engage parents to support their child's progress. The school principal's responsibility is to define and drive school improvement strategies, consistent with regional and national directions and priorities, provide instructional and administrative leadership for the school and involve school community to achieve school improvement goals. The task of the regional level is to support schools, facilitate communication between schools and regional centres as well as buffer resistance to change. At the state or system level the task is to set the system strategy for improvement, create support and accountability mechanisms to achieve system goals, establish decision rights across all system levels (Barber et al., 2010).

V. Main lessons for Estonia from PISA 2009

Estonian education system together with Finland, Sweden, Japan, Norway, Iceland and Hong Kong have been marked as successful school systems where student performance is above average and the student equity is below average. At the same time PISA draws our attention to problem areas, which have been little discussed but need attention and further carefully considered actions.

What is PISA 2009 feedback on Estonian education system and its performance?

1. **Student performance in all three domains- reading, maths and science.** These three domains are fundamental bases for a young person to build up the future educational and career paths as well as be able to participate in lifelong learning. According to the international comparison, we can say that for the most part students in Estonia have mastered the baseline knowledge and skills in these domains.
2. **Student distribution according to proficiency levels** shows that Estonian education system has succeeded in supporting students at lower proficiency levels where we show very good results in the international comparison. However, from the national point of view it is essential to have students able to solve also more complicated tasks requiring creativity, logical thinking and ability to apply their knowledge in different situations. The modest numbers of high achievers in levels five and six (which can be attributed to teachers' job well done in work with talented students) cannot be addressed as a problem. We should rather examine our everyday teaching activities as we are lacking any stronger arguments to explain why 45% of students in Finland by just following the regular teaching process can solve tasks for levels 4 to 6, but it is only 22% in Estonia. It can only be explained by examining the focal aspects in the teaching process- what sort of tasks are done in the classroom, what is more emphasized- fact learning or thought provoking exercises. OECD has pointed out the strong connection between research community and top performing students. Although the proportion of students who have reached second and higher levels is relatively high in comparison to other countries, it has to be noted that 13,3% of Estonian students did not reach the baseline level in reading and 38,9% of students did not reach level 3 which is considered to be the baseline level for developed countries.
3. **Variation of student performance between schools shows that students have access** to education of different quality in Estonia. Mean scores between the strongest and the weakest schools differ almost two times. The big variability of student performance poises a question why schools in Tallinn, Tartu or on the islands are the best performers but big county centres show more modest results. At the same time there are smaller schools who do not select their students but show similar performance to top schools practicing student selection. For that reason the question is not only about students and their abilities but also prompts us to think about different teaching and working methods of teachers and school leadership.
4. **Performance levels according to the language of instruction** are still a problem. The performance of students from Russian medium schools is significantly lower than for students in Estonian medium schools. At the same time we have to note that in comparison to PISA 2006 the performance of Russian students has improved however, but the gap is still big. 39 score points on PISA scale is considered similar to one year of schooling (OECD, 2010d). This means that students finishing Russian medium comprehensive schools are significantly less prepared to make choices concerning further studies and participation in lifelong learning.
5. **Student performance depends also on gender.** In reading literacy girls outperform boys for almost one school year. Therefore there is an unequal starting point between boys and girls when they face the choices of their future possibilities at the end of comprehensive school. Especially if reading literacy is essential in mastering the necessary knowledge and skills. There is also a

statistically significant gender difference in mathematics, here the boys outperform girls.

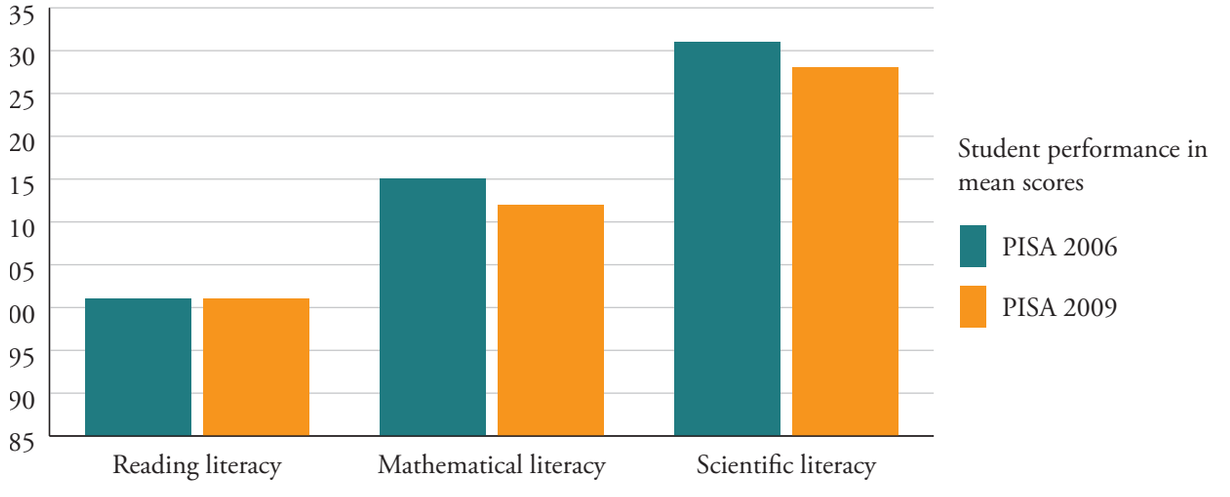
6. **Performance variability within schools** shows that student outcomes between different domains in the same school can be very different. There are schools where mean scores between two assessed domains reach 80 score point difference; which is equivalent to two school years. Such a problem suggests the existence of different teaching approaches. There is definitely a role for the school principal who has not paid enough attention to teacher's role in shaping students' competencies as well as teachers have not received enough professional support or in an extreme case the principal has not made the right decisions in hiring or firing of some teachers (Kitsing, 2011).

Appendix 1 shows an overview of educational policy implications based on PISA results as well as our results.

Changes in performance from PISA 2006 to 2009

The performance trends show the stability of implemented educational policies and provide a feedback on the effectiveness of the reforms carried out in the past. Estonia has participated in two PISA surveys therefore trends cannot be accessed directly. From the scores of the two surveys we can observe that results of Estonian students have slightly declined in mathematics and science (figure 2).

Figure 2. Changes in mean scores from PISA 2006 to PISA 2009



Percentage of students in lower proficiency levels has increased and percentage of students reaching higher levels of proficiency has decreased. In mathematics percentage of students below second level of proficiency has increased from 12, 1% to 12, 6%, in science from 7, 7% to 8, and 3%. In reading the percentage of students below second level of proficiency has slightly decreased (from 13, 7% to 13, 4%). At the same time distribution of students in fifth and sixth levels has decreased from 11, 5% to 10, 4%, in maths from 12, 6% to 12, 0%. Although the mean score of reading literacy is the same as in PISA 2006, this is likely due to improved performance of Russian speaking students. Russian medium school students have showed improvements over the two assessments.

Estonia is participating also in PISA 2012 where the main domain of assessment is mathematics. After PISA 2012 we will be able to see trends and receive more feedback on the effectiveness of the reforms implemented in the Estonian educational system over the past decade.

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Appendix 1. Policy implications from PISA results

Results	Policy implications/dangers	Estonian results
Mean score of student performance in three domains (reading, mathematics, science)	1. Student knowledge, skills, attitudes in basic domains compared internationally. 2. Base for student learning skills and participating in lifelong learning	Student results in all three domains are statistically significantly better than OECD average. Out of the three assessed domains Estonian students are most successful in science.
Distribution of students according to proficiency levels	Risk groups versus future contributors to the development of the society	**In international comparison good results in number of students reaching baseline proficiency level. These results are very good among countries in Europe.** **Modest number of students reaching top performance levels (5 and 6),** especially in reading (OECD mean 8,0%, Estonia 6,0%, Finland 14,5%), in mathematics (OECD mean 12,7%, Estonia 12,0%, Finland 21,7%), slightly better results in science (OECD 8,5%, Estonia 10,4%, Finland 18,7).
Mean scores of schools; regional differences	1. Student aspect: equal access to education 2. School effectiveness aspect: • Different quality of school leadership • Different quality of teachers	Differences in mean scores between schools (max) 320 score points in reading, 291 in maths, 340,7 in science.
School performance according to language of instruction	Quality education depends on the language of instruction	Difference between Estonian and Russian medium schools is 37 score points in science, 37 in mathematics, 31 in reading. **If 39 points are considered equal to one year of schooling, then difference is close to one year.**
Student performance according to gender	Acquired education is gender dependent	In reading the gender gap in Estonian medium schools is 43 points in favour of girls and in Russian medium schools the gap is 39 points in favour of girls which corresponds to **one year of schooling.** 18, 9% of boys (one-fifth) do not reach the baseline proficiency level. In mathematics boys are **8 points** better which is a statistically significant difference.
Within school performance differences	1. Weakness of school leadership (to notice, decide, act) 2. Student competencies depend on teachers/ school principal/ school owner	Noticeable differences between performance in assessed domains within some schools. For example, difference between math and reading 83 points; Math/Science 85 points, Reading/ Science 76 points. It can be concluded that **in some schools the performance difference in the assessed domains is equal to two years of schooling.**
Trends	Feedback on effectiveness of the educational reforms and implemented improvement acts.	Trends cannot be discussed based on two surveys; however, performance results have decreased in Mathematics and Science. Percentage of students at the lower proficiency levels has increased (0, 6 points Science and 0, 5 points in Maths); whereas the percentage of students at the top levels has decreased (1point is Science and 0, 6 points in Maths).

Appendix 2. Description of a great education system and Estonian examples

(Source of the first three columns: *How the world's most improved school systems keep getting better?* McKinsey&Company, 2010)

Theme	Description	Example interventions	Estonian examples of intervention in the corresponding area
Cultivating peer-led learning for teachers and principals	**Learning communities:** The system facilities school-based learning communities to create peer-led support and accountability to each other **Flexibility:** The system provides effective educators with greater pedagogical autonomy **Rotations:** The system rotates educators throughout the system in order to spread learning and varied styles of mentorship	• Collaborative practice between principals and teachers • Decentralizing pedagogical rights to schools and teachers • Creating rotation across schools and between the centre and the schools (in Estonian context that would be cooperation between schools and education departments of municipalities)	• Estonian education information system (EHIS) lists all the intervention examples from all schools and average results of the comparison groups (school have been divided according to their size in comparison groups) • There are teachers associations in regional and national level. For example, there are teacher associations of certain subjects in the counties, Association of School Principals, etc • Implementation of the recognition system in general education in order to promote best practices
Creating additional support mechanisms for professionals	**Leverage:** The system provides administrative staff in schools so that teachers and principals can focus on pedagogy and leadership rather than administrative tasks	• Providing additional administrative staff.	• Regulation by Estonian Education and Research ministry states the minimum number of personnel required for a school to ensure its activities in the following areas: management, administration, student support • Regional advisory centres where teachers teaching students with learning problems get advice and support.
System-sponsored experimentation/ innovation across schools	**Innovation:** system supports innovation and shares it with other schools in the system	• Funding for innovation • Creating opportunities to share experiences	• State supports creation of innovative learning environment, use of ICT learning tools and teacher training • State supports activities by universities and enterprises that foster student interest, abilities and skills. For example, Tallinn Technical University, Tartu University, Tallinn University of Applied Sciences have supported students in areas of robotics and engineering, Science School of Tartu University supports science learning for students interested in science, Association of Information Technology and Telecommunications promotes IT education, etc. • State together with ESF has supported variety of innovation projects in education. For example, implementation of e-progress interview, developing and implementing network of entrepreneurial schools in Ida-Viru and Tartu counties, establishing Science and Hobby school in Saaremaa where all students can develop and be involved in research (discovery) work • Internal advisors (certified practitioners) for educational establishments share their experience during the internal assessment • It has become a tradition to organize conferences „Master-class of leadership", where successful school leaders can share their experiences

Appendix 3. Description of a good education system and Estonian examples

(Source of the first three columns: *How the world's most improved school systems keep getting better?* McKinsey&Company, 2010)

Theme	Description	Example interventions	Estonian examples of intervention in the corresponding area
Raising calibre of entering teachers and principals	**Recruiting:** The system raises the entry bar for new teacher candidates **Preparation and induction:** The system raises pre-service training quality and certification requirements	• Recruiting programs • Pre-service training • Certification requirements	• Vacancies are announced publically and best candidates are selected • Qualification requirements have been developed for teachers and principals. Professional teaching standards have been developed • National framework for teacher training has been developed • Välja on töötatud riiklikud raamnõuded õpetajate koolitamiseks • Foundation *Noored Kooli* (Youth to School) has started an educational program for young people. Every year 20 to 25 capable and active university graduates are offered a unique experience- to be a teacher
Raising calibre of existing teachers and principals	**Professional development:** The system raises professional development requirements and provides more opportunities for self-, peer-, and centre-led learning and development **Coaching on practice:** Instructional coaches work with teachers to strengthen their skills in areas such as lesson planning, student data analysis, and in-class pedagogy **Career pathways:** The system creates teacher and leadership specializations through career pathways, raising expectations with each successive pathway and increasing pay accordingly	• In-service training programs • Coaching on practice • Career tracks • Teacher and community forums	• Teachers have an obligation to participate in in-service training programs that are funded by the state (3% from the teaching salary fond) • Teacher induction year and mentoring • Teacher certification and salary dependency on acquired qualifications • School leader model of competencies has been developed which should guide the management of schools
School based decision making	**Self-evaluation:** system supports school internal evaluation policy; also increasing the availability of data **Flexibility:** Schools shape school curriculum according to the individual needs of the students; school autonomy increases	• Self-evaluation • Data system • Autonomous and specialized schools	• State inspection role has been minimized; schools evaluate their performance themselves (internal evaluation has been introduced as mandatory) • State guarantees availability of competent advisors who can advise schools • Schools have access to their performance standards from Estonian Educational database (EHIS), each school gets a feedback on their performance in PISA • State curriculum is flexible and schools have the rights to develop their own curriculum, also individualized curricula according to the needs of students