

Chapter 10

Educational Assessment in Estonia



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Introduction to International and National Assessment Context and Its History in Estonia

“Estonian people believe in education. We truly think that the best legacy we can offer to our children is not a piece of land, a house or a bank account, but good education”, said Toomas Hendrik Ilves, the President of Estonia, after learning about the success of Estonian students in PISA 2012. When Estonian media was notified about the release of data from the PISA survey, the press conference room was packed with journalists, waiting for the minister to announce the results. PISA is a well-recognized acronym in Estonian society and the tension before the announcement was high.

Estonia joined PISA in 2006 and its people, being rather modest and critical towards their education system, did not expect anything extraordinary. Results turned out to be most positive, international comparisons ranked Estonia as one of the top performing countries and Estonians experienced a positive “PISA shock”. The results were similar to Finland and high-performing Asian countries. Gradually, sceptical Estonians regained confidence in their education system, policy makers got a confirmation that the educational policies and reforms have been successful and schools were reassured that their teaching methods have been effective. PISA data release in Estonia is not only time to actively participate in debates about education but also to recognize and appreciate the job well done by everyone participating in the education system – students, teachers, parents.

High rankings of Estonian students in PISA have brought considerable global attention towards Estonia and its education system. Distinguished education experts, policy makers, researchers, and teachers from all around the world come to Estonia

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to see the system first-hand. Their inquiries about the reasons behind the success have made Estonians look in the mirror and reflect about the possible factors that have contributed to the high results. Success in education can be attributed to a multitude of factors, including social, cultural, institutional and historical aspects (Simola 2005). This chapter will attempt to look at some of them.

Estonia and Its School System

Estonia is a small country (45,000 km²) in Northern Europe, located on the shores of the Baltic Sea, with a population of 1.3 million. It is rich in forests and has nearly 1500 islands along its coastline. The official language is Estonian, which belongs to the Finno-Ugric family of languages. The Estonian population comprises 69% Estonians, 25% Russians and 6% other ethnic groups (Statistics Estonia 2017). The distribution of the population is reflected in the education system. The Estonian education system consists mainly of schools with one of the two languages of instruction – Estonian or Russian.

Estonia is one of the most digitalized societies in the world with numerous online services provided for its citizens. Nearly everything can be done online – filing of tax returns, casting a vote in elections, registering a child birth, etc. The demand for digitally educated citizens puts a significant pressure on the education system (HITSA 2018). Schools have integrated a variety of digital solutions and many teachers use computers, smartboards, robotics kits and other digital devices in their lessons.

Estonia's precarious history has made Estonians adaptive and inventive with regard to different survival strategies, and education has had an important role in the process (Ruus 2002). Formal education dates to the thirteenth century when under the German and Danish rule churches opened the first schools in the territory of Estonia. In the seventeenth century, during the Swedish rule, the first academic schools and the first university were established. In the eighteenth century, the territory of Estonia came under Russian rule, and the education reforms in tsarist Russia applied also to Estonian elementary schools. The first folk schools were opened at the end of the eighteenth century. According to the census in 1897, the level of literacy among Estonians was 79.9% which was the highest in the Russian Empire (Lees 2016). Estonia became an independent state in 1918 and the government introduced general, compulsory and free education for everybody. During the Soviet occupation, education remained in Estonian, strong emphases was put on subjects such as mathematics and science.

A turning point in the history of Estonian education occurred before the break off from the Soviet Union in 1990. In 1987, the Estonian Teachers' Congress criticized the existing school system and demanded an independent Estonian education (Ruus 2002). The first step towards Western education was to develop a completely new, Marxism-Leninism ideology-free curriculum. The development involved participants of different backgrounds and the curriculum was adopted and introduced to

schools before the regaining of independence in 1990. Since 1996, the national curriculum not only states the content of the core subjects, but also emphasizes the need to develop core and cross-curricular competencies. The national curriculum is updated approximately every 10 years, and it states the learning outcomes that students should master during different stages of their education. The legal framework for education in Estonia was established in the 1990s (Lees 2016). The Law on Education (1992) outlines the rights of equal opportunities for everybody. Some significant regulations that followed were the Laws on Basic and Upper Secondary Education Schools (1993), National Curriculum (1996), Law on Private Education (1998).

The Estonian education system is based on a strong pre-school education. Around 94% of children attend kindergartens; children start school at the age of 7. Compulsory education, called the “basic education” lasts from grades 1 to 9. The first streaming into academic or vocational education tracks takes place after grade 9 when students are 15–16 years old. Educational expenses are covered by the state and administration of schools is the responsibility of local municipalities. Schools have considerable autonomy; they develop their own school curriculum, which is based on the framework provided by the national curriculum. Schools have the freedom to decide on the content of optional courses, duration of lessons, and if they opt to specialize in subjects like science, languages, music, art, etc. They can independently choose textbooks and teaching materials, principals can hire and fire teachers, decide on school resource allocation and plan teacher training (Innove 2016).

The education system was “upgraded” in 2014, when the Estonian government adopted “the Estonian Lifelong Learning Strategy 2020”. The document provides guidelines for strategic development in education and serves as the base for funding decisions in education. The document foresees five priorities for development:

1. Change in the approach to learning, orientation to progressive and student-centred approaches
2. Empower competent and motivated teachers and school leadership with knowledge on modern approaches and practices
3. Align lifelong learning opportunities with needs of the labour market
4. Digital focus in lifelong learning
5. Equal opportunities and increased participation in the lifelong learning. (Ministry of Education and Research 2014a, b)

All goals are elaborated in detail; they are linked with indicators from national and international assessments and are annually measured.

National and International Assessments

As schools are autonomous, and education is financed by the taxpayer money, certain accountancy mechanisms are required for steering and measuring the efficiency of the system. The state has the right to get feedback on how well students have

mastered the educational goals set in the national curriculum (Ministry of Education and Research 2014a, b). With that in mind, the external evaluation system was established in the mid-1990s. Its main components are sample based tests for grades 3 and 6, as well as national examinations for grades 9 and 12. Centrally provided tests for grades 3 and 6 are low stakes tests, as students are not individually graded, and are hugely popular among schools. Many non-sampled schools administer the tests to their students as schools consider them to be a valuable feedback reflecting the instructional quality of the school. Data is shared with parents and other stakeholders. Grade 6 tests are all computer based. The strategic goal is to have computer-based national assessment system up and running by 2021 as intended in the Estonian Lifelong Learning Strategy 2020.

At the end of compulsory education, in grade 9, students take three centralized exams, whereas the marking takes place at school by the subject teacher. The requirements for finishing the basic school consist of centralized examinations in Mathematics, Estonian language, one freely chosen subject by the student (from a list of 10 subjects), and a completed research project organized by the school.

At the end of upper secondary school, grade 12 students take three centrally set and centrally marked national examinations that are valid also for entering universities or other higher educational establishments. Students should pass the national examinations in Estonian or Estonian as a second language, mathematics (two different curricula are offered with different number of learning hours and corresponding exams), and in a foreign language. In addition to centralized examinations, students are required to pass a school exam, and conduct an independent research project in the topic of their interest.

The first international student assessment where Estonia participated was IEA study TIMSS 2003 (Trends in International Mathematics and Science Study). That was followed by OECD PISA (Programme for International Student Assessment) 2006, 2009, 2012, 2015 and 2018. Estonian teachers and principals have participated in OECD survey TALIS (Teaching and Learning International Survey) in 2008, 2013 and 2018. Student readiness to be future citizens has been assessed by IEA International Civic and Citizenship Education studies in 2009 and 2016. Estonia has also participated in the OECD PIAAC (Programme for the International Assessment of Adult Competencies), which is a survey on adult skills in literacy, numeracy, and problem solving in technology rich environment. The international assessments have provided a full picture of Estonian education from student, teacher and system points of view.

Findings of International Assessments

According to OECD data, Japan, Estonia, Finland and Canada are regarded as the four highest-performing OECD countries (Organisation for Economic Co-operation and Development 2016a, b, c). The domain in which Estonian students have excelled in all international assessments is science. Estonian students scored 534 points in

science in PISA 2015, exceeded only by Singapore (556 points) and Japan (538 points). High performance in science was already noted in TIMSS 2003 – the first international student assessment survey where Estonia participated. The unexpectedly high results were, subsequently, repeated in the following PISA cycles. Results have been stable in science, slight improvements observed in mathematics and a larger increase in reading literacy.

According to PISA data, the Estonian education system is not only high performing but also ranks high in equity. Students from different socio-economic backgrounds have good access to education, and they achieve high results. Only 8% of the score variance in science is explained by students' socio-economic background. As much as 48% of students are the so-called resilient students, which is the sixth highest result among participating countries. Resilient students come from the bottom quarter of the PISA index of economic, cultural social status and perform among the top quarter of students among all countries after accounting for socio-economic status (Organisation for Economic Co-operation and Development 2016a, b, c).

Another high point of Estonian education system is that it has a relatively small share of students who perform below the baseline level of proficiency. PISA highlights student performance not only according to the mean scores but also by the distribution of scores on levels of proficiency (levels 1–6). The higher the level, the more complex are the tasks the student can solve, level two being the baseline level of proficiency. Only 8.8% of Estonian students score below level two; this share is smaller only in Vietnam and Macao (China). Baseline knowledge in science has been reached by 91.2% of Estonian students (OECD mean 78.8%). There is no performance gap between boys and girls in science; also the share of top performers has increased since 2006 (Innove 2016). The need to pay more attention to high-performing students has been a priority in the educational discourse and the effect of efforts is seen in the more recent data of the international assessments. Many schools have started to pay more attention to students who could reach higher levels of proficiency, and organize different activities to develop their full potential.

In examining Estonian policy documents, we notice that the high equity, as seen in PISA, complies with the principles of the comprehensive school, rooted in the legislation in the 1990s. The policy includes equity and inclusiveness. For example, all students get free school meals, free textbooks, access to different extra-curricular activities, free school transport, etc. Schools must provide the best learning environment for everyone, regardless of students' family background. If needed, students should receive additional instruction and have access to services of psychologists, social pedagogues, speech therapists or other support. Grade repetition is rather exceptional; students should get help on time to move on (Innove 2016). The system cares for the weakest students, and the small share of low-performing students in PISA reflects that.

An important lesson Estonia learned from the international assessments concerns the performance difference of schools with Estonian and Russian language of instruction. Although the Russian-medium schools have improved over time, the performance gap is still equal to approximately one school year of learning, which

on the PISA scale is about 39 points. All schools get the same funding; have the same guidelines from the national curriculum and conditions for learning, etc. Additional research has been done and it shows that the gap in science performance could be explained by mainly two factors: (1) the socio-economic status of the household and parents' educational level, and (2) student attitudes and beliefs (enjoyment of studying science and epistemological beliefs) (Täht et al. 2018).

International assessments shed light not only on the student cognitive outcomes but also on their background information. Issues of student well-being, learning environment, learning habits have been significant to learn about. The Estonian Lifelong Learning Strategy 2020 has determined that student well-being is an important aspect in education.

The PISA 2015 survey asked students how satisfied they were with their life in general at the time of the test. The scale of possible responses ranged from 1 to 10. The higher the number, the higher life satisfaction students reported. The mean score for Estonian students was 7.6, which shows a rather high level of students' life satisfaction. OECD has ranked Estonia (together with Finland, the Netherlands, and Switzerland) as one of the countries with high student performance and high life satisfaction. Collected background information also points out areas which need a constant check, like bullying, sense of belonging, student truancy, and so on (Organisation for Economic Co-operation and Development 2017a, b).

Already in 2002, the Estonian national curriculum introduced problem-solving skills, and social and emotional skills as important components of the education outcome. Mastering of these competencies should be integrated into the teaching process and not taught as separate subjects. In PISA 2015, the innovative domain was collaborative problem solving. This was a good chance to see how well Estonian students could solve problems with interactive, "virtual" companions in unfamiliar situations. Estonian students scored sixth among the participating countries with a mean score of 535 (exceeded only by Singapore (561), Japan (552), Hong Kong (541), Korea (538) and Canada (535)). This confirmed that teaching of the "soft skills" like teamwork is applied effectively in Estonian schools.

The international survey that has given voice to schools to speak about their experiences is called TALIS (Teaching and Learning International Survey). TALIS studies teachers and school principals from around 200 schools per country, explores issues about initial teacher training and continuous professional development, providing feedback, school and classroom climate, etc. It also asks the teachers how satisfied they are with their job and how they feel about their profession (Organisation for Economic Cooperation and Development 2014). Estonia has participated in TALIS three times (2009, 2013 and 2018).

What is the portrait of an average Estonian teacher according to TALIS 2013? Teachers are mostly female (84.5%); the average age is 48; average teaching experience is 21.6 years; 95% of teachers have the required qualification and 35% of teachers, mostly older teachers, work part time. This is not always their own choice as in smaller schools there are not enough lessons or students, to be employed full time. At the same time there is an overall shortage of teachers, especially in science subjects. Estonian schools and class sizes are rather small; on average, there are

17.3 students per class. The school year in Estonia is among the shortest in world with 175 days, and teachers can enjoy 2 months of summer holidays. Although school principals think that the school climate is positive, problems listed concern mostly mental bullying, truancy, student cheating. Especially less experienced teachers feel that they are not valued enough by society. However, they all like their job and the school environment (Organisation for Economic Cooperation and Development 2014).

TALIS has pointed out a problem that the teacher population in Estonia is aging and there is an increasing shortage of teachers. Teacher salaries have been considerably increased during the last years; however, they are still low compared to absolute numbers of other OECD countries (Organisation for Economic Cooperation and Development 2018).

What have been the contributors to Estonian student success? As the distinguished American education expert Marc Tucker mentioned after his visit to Estonia in his blog *“it is this combination of low pay, the small number of days in the school year, the high workload for teachers and high student performance that makes Estonia’s system so efficient”* (Tucker 2015). This observation points to serious issues in the sustainability of the system’s effectiveness, and similar concerns have been expressed by the OECD observers (Organisation for Economic Cooperation and Development 2018).

Different activities are done at the state level to promote the image of the teacher’s profession. A well-rooted tradition in Estonia is the celebration of Teacher’s day at the beginning of October. To identify and reward the best teachers in the country, a national nomination and award ceremony is organized. The event is called “Estonia Learns and Thanks” where teachers in different categories from all over the country are nominated and awarded (Ministry of Education and Research 2018a, b). The award ceremony is aired on the national television; it always draws a big audience and is later energetically debated in the media. There are also many programmes provided by the government and co-financed by the European Union (ESF) that aim to promote professionalism of teachers and school leaders.

How to Go Further? Where Next?

International assessments have shown that the education system in Estonia is high performing and effective; however, it has some sustainability issues concerning the future of the teaching profession. Education is a process in progress and policy decisions about the future of the education system is, in large part, a political process (Weiss 2001). Education policy makers recognize that they are influenced by factors such as scientific studies, organizations, people and information sources (Swanson and Barlage 2006). This suggests that international studies such as PISA and TALIS contribute partially to the process of educational policy making.

The main components of the national external evaluation system are the assessment of learning outcomes, and the evaluation of schools; however, guidelines for

the future directions for Estonian education come from the Estonian Lifelong Learning Strategy 2020. Five goals in the strategy document have specific indicators to be reached and the goals are supported with substantial funding by the state. The first goal in the Estonian Lifelong Learning strategy 2020 moves the education away from the traditional ways of teaching towards a progressivist, child-centred educational approach. In this “changed approach to learning”, personal and social development of each learner should be encouraged, as well as the development of their learning to learn skills, fostering creativity and entrepreneurship during all levels and types of education (Ministry of Education and Research 2014a, b). In regard to the future of educational assessment in Estonia, the strategy document shifts the attention towards formative assessment, which should support learning and the individual development of each learner. The focus is on the learners, their key skills and cross-curricular competences.

According to legislation, the goal of external assessment is to give students, parents, schools, school administrators and the state an objective and comparative feedback to the learning objectives stated in the national curriculum, as well as provide an input for education policy making (Põhikooli- ja gümnaasiumiseadus 2010). Considering the legislation and strategy document, the Ministry of Education and Research has published a plan for 2020. It focuses on the following ideas:

1. Support every student, teacher, school

This focus complies with the goal to enhance digital technologies in teaching and learning. The Ministry of Education and Research has launched the development of innovative digital assessment models. A lot of effort is put into the development of computer-based “diagnostic tests” that would detect what students already know and what are their gaps in a specific topic or skill. Literature suggests (Christodoulou and William 2017) that when students learn new material, 75% of them make the same mistakes, but for different reasons. Teachers, at the same time, often do not have a good overview of the topics students have mastered well or those they have failed to understand. The solution to the problem is a feedback system or diagnostic tests that find evidence about student learning. Computer-delivered diagnostic tests decrease the teacher’s workload and provide teachers with immediate feedback, for example, about the effectiveness of the teaching methodology applied in the teaching process. Based on the test results, the teacher can quickly determine what material has been mastered by the students and what needs more attention. As a result, teaching and learning becomes more effective. Diagnostic tests are currently in the development phase. Other sets of computer-based tests, developed in collaboration with universities, are tests in digital literacy and tests in certain key skills like learning to learn.

2. Collect supportive evidence to decide about development of students and schools

Until recently, the evidence collected about student learning outcomes was the information from the sample-based centrally set subject tests in grades 3 and 6, and final exams for grades 9 and 12. A recent addition to the external evaluation is the study on student well-being.

The Estonian Lifelong Learning Strategy 2020 sets a goal to increase student well-being, improve school learning environment and increase participation rates in lifelong learning. In 2015, a decision was made to create an instrument to measure the progress towards the set goals and a theoretical framework of measurement was developed. Pilot studies took place in 2016 and 2017 and the first full-scale well-being survey was administered in 2018 to all students from general education schools in grades 4, 8 and 11. To make the picture more complete, separate questionnaires for teachers and parents of the participating students were used. In addition, pre-primary and vocational education establishments were included in the well-being survey. The goal is to get the big picture at the system level and to provide individual schools with comparative reports about the general well-being and school climate. Each school gets a detailed report that provides indicators about general well-being of students, teachers and parents of the school. It also points out the problematic areas for the school to work on and improve (Ministry of Education and Research 2019). Schools use this data as an input for evidence-based self-development and quality improvement. The creation of centralized well-being measurement tool has spared schools from developing their own questionnaires on this matter and added quality and comparability to the whole system.

3. Make suggestions for education decision making at the state level

External evaluation provides feedback about the implementation of national curriculum. It also suggests where changes should be made in the national curriculum, in teachers' continuous professional development, in textbooks and in teaching and learning process.

4. Inspire schools in the learning process

External motivation is needed for generation of internal motivation and for encouragement of autonomous motivation (Ryan and Deci 1999). It is expected that the new, state-developed computer-based tests and digital learning materials will assist teachers to get fast feedback about student achievement, detect knowledge gaps and adjust their teaching accordingly. The on-demand digital tools enable constant monitoring of students' errors and can be used as a rich source for finding next learning assignments and filling previous knowledge gaps. Digital tests come along with digital item banks in different subjects that enable teachers to individualize learning and group students for different activities (Innove 2019).

As already mentioned, this is work in progress. The effectiveness and the school approval of the new digital tools are yet to be seen. Due to the autonomous school system, where schools and teachers can choose how they teach their students, the adoption of the new tools for learning and its measurement to some extent is based on voluntary principles. There is a strong push from the policy makers to use digital tools in the learning and assessment phases. Digital solutions with all the interactive possibilities engage children very strongly and allow studying anywhere (Kikas 2018).

As the literature suggests, education policy making to a large extent is a political process (Swanson and Barlage 2006). At the beginning of academic year 2018–2019,

the Minister of Education and Research announced that external evaluation in Estonia should move away from the culture of testing and lean towards individual student support. International assessments have shown that in comparison to other countries, Estonia is rather modestly subjected to standardized testing (Organisation for Economic Cooperation and Development 2017a, b). The minister's proposal was to abolish the centralized final examinations at the end of grade 9, which has been a significant component of external evaluation, and let schools themselves decide if their students have completed the compulsory education. Another suggestion was to extend the list of national exams for grade 12, which was not a new idea. Until 2012, the list of exams provided by the state consisted of 14 exams, which was substantially cut down by a different decision maker.

Since effective education is a balance between rigour and freedom, tradition and innovation, the individual and the group, theory and practice (Robinson and Aronica 2016), there is a hope that the autonomous Estonian schools will assimilate the suggested innovations in a good balance with the best educational traditions.

Well, what is the secret of Estonian success? Marc Tucker put it this way: “*The fact that Estonia is among the top performers in PISA does not appear to be the result of education policies pursued since Estonia gained its independence, but rather the result of hundreds of years of political, social and educational development which ended up supporting a strong commitment to education as well as a tradition of very high education standards, very demanding curriculum, high quality examinations built directly on the curriculum, highly educated teachers, and most of the other drivers of high performing national education systems*” (Tucker 2015).

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