

REPUBLIC OF ESTONIA  
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AND RESEARCH



OECD Implementing Education Policies

# **Reviewing monitoring and evaluation practices in Estonia**

Output 1.1.

Note summarising current monitoring processes, data and indicator frameworks in Estonia in a comparative perspective

27 January 2020

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## Output 1.1.

### Note summarising current monitoring processes, data and indicator frameworks in Estonia in a comparative perspective

*This note constitutes Output 1.1. of the project **Reviewing education monitoring and evaluation practices in Estonia**, based on an agreement between Estonia, the OECD and the European Commission DG Reform to support its development.*

*The note summarises current monitoring processes, data and indicator frameworks in Estonia in a comparative perspective. The aim of the note is to provide background information and analysis on the current situation in Estonia from a comparative perspective for the development of the monitoring systems and data to be aligned to the new Education Strategy 2035.*

*The note introduces the topic, presents the educational context in Estonia relevant to monitoring, reviews monitoring system in terms of goals, responsibilities, indicators and tools in Estonia, with information and comparison with relevant practices from reference countries Denmark and the Netherlands, provides an analysis on how Estonia may consider next steps in the development of their monitoring system and provides an overall conclusions the note.*

## Introduction

### *Why review monitoring practices in Estonia?*

There is recognition that education is of central importance in shaping a knowledge society and increasing economic competitiveness. In this regard, monitoring and evaluation of education systems (also called system evaluation) has a heightened role to play, as it informs policy planning, and can contribute to education system improvement. To this end, availability of relevant information and data on education system performance at different levels is important to understand how students and education institutions perform and progress. However, data alone cannot drive performance, but it can be aligned to educational objectives and priorities at national, regional or local level to guide those involved in the education system and focus stakeholders on the major goals and challenges in the education system as a whole.

The Estonian education system is considered as one of the best performing systems among OECD countries, combining quality and equity in education. One of its main features is its decentralised governance and high degree of autonomy of local authorities (school owners): the state sets national standards and establishes principles of education funding, supervision and quality assessment. Within these guidelines, local authorities and schools have a high level of autonomy for resource allocation and curriculum (OECD, 2016<sup>[1]</sup>).

In this context, the use of relevant evidence and data is at the core of strategic education governance, and thus to the improvement of learners' experience and to the quality of education as a whole. Monitoring education is therefore a central activity in balancing autonomy with accountability, promoting more effective and efficient policy-making, and ensuring equitable and quality education for all (OECD, 2013<sup>[2]</sup>).

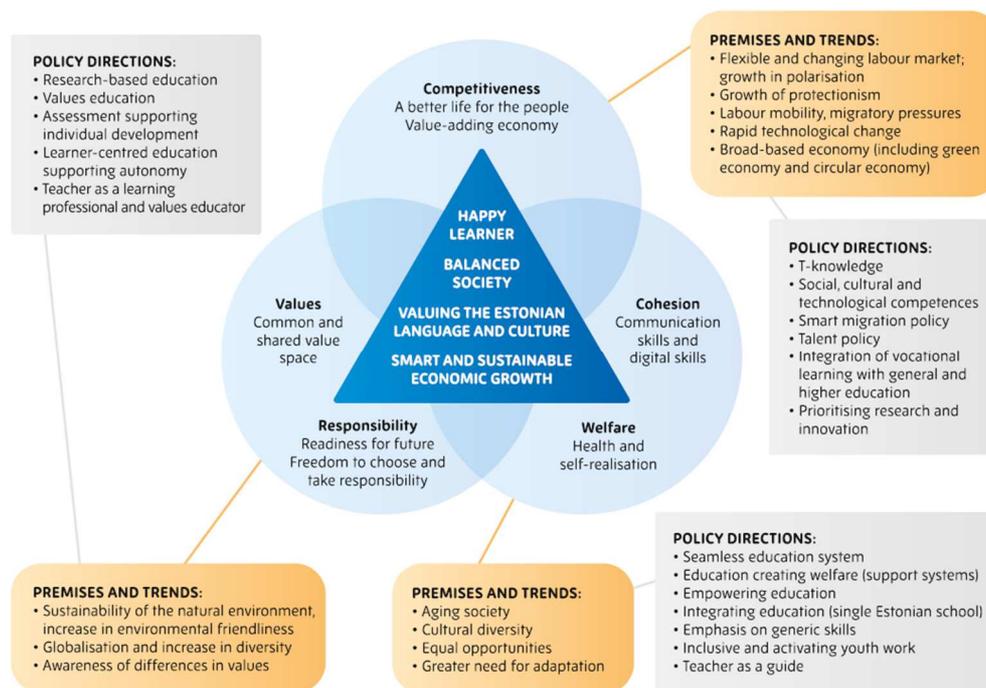
The MoER has identified four key shortcomings in the current education monitoring system:

- The fragmentation and lack of coherence of the current sub-systems of monitoring (e.g. between self-evaluation, school improvement planning, external evaluation), which hinders policy coherence and does not support efforts towards school improvement and learners' progress;
- The lack of agreement on what are meaningful indicators to monitor key education information, including the quality of teaching and learning, the risk of low achievement, the progress of educational institutions regarding strategic objectives; and the need to define social-economic background and develop indicators to monitor the impact of socio-economic background on learning pathways and learning outcomes.
- Limited knowledge and skills of several key stakeholders in data analysis and use, including of parents and learners themselves;
- The need for advice on addressing issues of data management and use, including matters of privacy, ethics and risks mitigation.

Against this backdrop, Estonia is now developing its new Education Strategy 2035 to guide the education system. Figure 1 presents a draft version of the conceptual vision that will be further refined. The Strategy goes beyond strict education performance, as it sets ambitious goals to achieve: an inclusive society of welfare and shared values, a competitive and sustainably growing economy, and a viable and growing Estonian culture and language.

However, to support the education system in accomplishing the Strategy, enhancing and updating the current monitoring system will be required to provide the right information for all levels of the education system. As an encompassing roadmap for Estonia's education, the Education Strategy 2035 can already serve as the primary guide to the analysis of relevant education indicators and the development of a coherent indicator framework.

**Figure 1. Smart and Active Estonia 2035**



*Note:* Ultimate goals (in the middle), main topics (blue background), premises and trends at both personal and national level (orange background) and main policy directions (grey background).

*Source:* Estonian Ministry of Education and Research (2019<sup>[3]</sup>), *Estonian Education and Research Strategy 2021-2035: Smart and Active Estonia 2035*.

## **Background and methodology**

To reach the goals set in its Education Strategy 2035, Estonia has requested support from the European Commission in the area of education monitoring and data-informed decision-making. The Directorate General for Structural Reform Support (DG REFORM, formerly Structural Reform Support Service, SRSS) of the European Commission has agreed to provide such support to Estonia together with the OECD. The project is funded by the EU and implemented by the OECD, with support from the SRSS, over the course of 18 months.

DG Reform provides tailor-made support to all European Union (EU) member countries for their institutional, administrative and growth-enhancing reforms. The support can cover the entire reform process, from preparation and design to implementation of the reforms and is fully funded by the EU and accompanied by DG REFORM.

Within the OECD, this project is implemented in the context of the “Implementing Education Policies” initiative, through which the OECD provides peer learning and tailored support for countries and jurisdictions to help them achieve success in the implementation of their education policies and reforms. To best support Estonia, a specific team bringing

together analysts from OECD's Directorate for Education Indicators of Education Systems and Implementing Education Policies teams has been created for the duration of the project. The team is supported with external consultants in some concrete work.

The overall goal of this project is to support the Estonian Government in strengthening data-informed decision-making in education through improvements to its education monitoring system. This implies a comprehensive review of the existing data and monitoring processes, and recommendations for their enhancement based on local and international expertise.

In this work, system monitoring refers to system evaluation according to the OECD evaluation and assessment framework, which involves: (i) the monitoring of student outcomes at a given point in time, including differences among different regions within the education system and given student groups (e.g. by gender, socio-economic or immigrant background); (ii) the monitoring of changes in student outcomes over time; (iii) the monitoring of the impact of given policy initiatives or educational programmes; (iv) the monitoring of demographic, administrative and contextual data which are useful to explain the outcomes of the education system; (v) the development of means through which the relevant information is provided to the different agents in the education system; and (vi) the use of the generated information for analysis, development and implementation of policies (OECD, 2013<sup>[4]</sup>).

The project aims to deliver a coherent and comprehensive set of recommended indicators and monitoring principles aligned to Estonia's Education Strategy 2035 and reviewed by national stakeholders, in order to contribute to strengthening education monitoring, promoting school improvement, and informing national and local decision-making.

This note constitutes the Output 1.1. of the project to review monitoring and evaluation practices in Estonia. It consists in a desk study of the educational system monitoring practices in Estonia, enriched with the international perspective of two country specific case studies, Denmark and the Netherlands and perspectives following a policy assessment visit undertaken in November 2019 by the project team to Estonia. An initial version of this note, drafted by the OECD team following an agreed outline, was delivered in December 2019. The note has been revised taking on board on the comments and contributions provided by the project advisory group (Estonia, DG Reform and OECD) in December 2019 and January 2020.

The purpose of this document is to provide an overview of the Estonian education monitoring system in perspective, and to guide further work during the project in defining relevant indicators for the Education Strategy 2035 and relevant associated monitoring principles. Further to this note, the project will deliver an analysis and identification of monitoring practices and data needs aligned to the strategy, a proposal for a comprehensive set of indicators, two stakeholder events (May and December 2020) to discuss and review the draft set of indicators, a capacity building workshop (October 2020) and a final proposal for a comprehensive set of indicators for the monitoring system aligned to the Education Strategy 2035 (April 2021).

## Estonia's educational context

The school system in Estonia is organised in three sequential levels: pre-primary education (ISCED 0, up to 7 years of age), basic education (ISCED 1 and 2, typical ages: 7 to 16); and upper secondary education (ISCED 3, Years 10-12/13, typical ages: 16 to 18/19). Basic education is organised according to two stages: primary education (ISCED 1, Years 1-6); and lower secondary education (ISCED 2, Years 7-9). School attendance is compulsory until acquiring basic education or attaining age 17.

Upper secondary education is of two types:

- General upper secondary education, mainly geared to the continuation of studies at higher education level (ISCED 34 programmes, Years 10-12).
- Vocational upper secondary education with two major strands:
  - Vocational secondary education, geared to working life or the continuation of studies at higher education level (ISCED 354 programmes, 3 to 4 years duration).
  - Vocational secondary courses based on basic education, geared towards an initial qualification for students, giving priority to their entering the job market while, at the same time, allowing them to study further (but with no direct transition to higher education) (ISCED 351/353 programmes, 2 to 2.5 years duration).

All children attaining age 7 before 1 October of the current year must attend school. Basic education (primary and lower secondary education) consists of a single school stage, from Year 1 to Year 9, providing comprehensive general education to students. General education includes basic education as well as general upper secondary education. Upper secondary education is not compulsory, though it is pursued by 72% of lower secondary students (25% pursue their studies in vocational education and 3% do not pursue further studies according to data from Estonia).

In addition to the vocational education provided as part of upper secondary education, there are two other types:

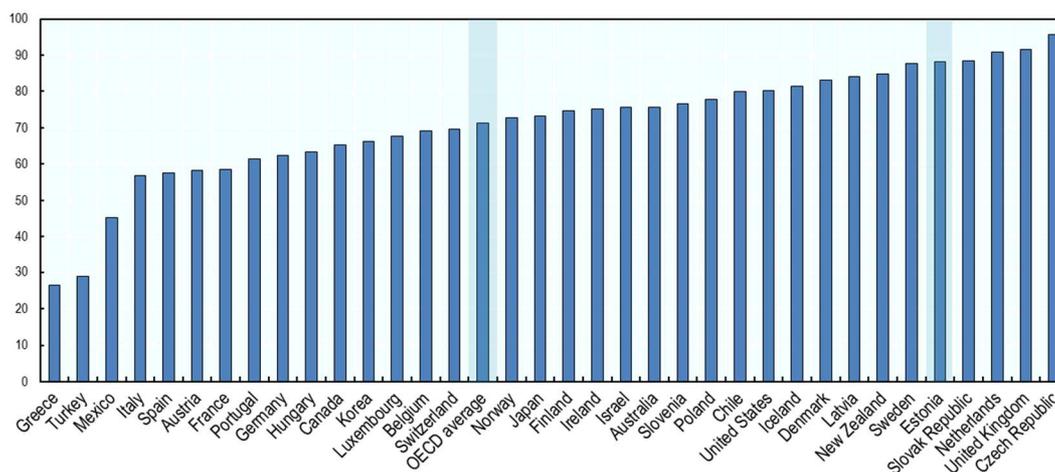
- Post-secondary non-tertiary level (ISCED 45), acquisition of a profession following general or vocational secondary education.
- Lower-secondary level (ISCED 251/253), acquisition of a profession for students who have not acquired basic education and who are past the age of compulsory school attendance (older than 17).

General and vocational education institutions can be state, municipally, or privately owned. A state school is established by the MoER, a municipal school is established by the rural municipality or city/town council, and a private school is established by a private organisation. In 2018-2019, 83% of general schools were owned by municipalities (8% of vocational), 11% by private organizations (19% of vocational), and 6% by the state (73% of vocational).

Local governments play a critical role in financing and managing Estonia's school education. Education constitutes the single largest expenditure of local governments and has consistently accounted for over a third of all local spending (Santiago et al., 2016[5]). For primary, secondary, and special education local governments receive earmarked grants from the national government to support, for example, the salary costs of educational

personnel, school lunches, and textbooks. There are no charges to students for textbooks, school lunches, or student transportation.

**Figure 2. Index of school autonomy, 2015**



*Note:* The index of school autonomy represents the percentage of tasks (pertaining to resources or curriculum) for which the principal, the teachers or the school governing board have considerable responsibility.

*Source:* OECD (2016<sup>[6]</sup>) *PISA 2015 Results (Volume II): Policies and Practices for Successful Schools*, OECD Publishing, Paris.

Schools benefit from extensive levels of autonomy (Figure 2). Within their schools, school directors are given full responsibility for the quality of education, financial management, appointment and dismissal of teachers, definition of teacher salaries (above a minimum) and relations to the school community and the public. School directors are appointed and dismissed by the school founder. School directors form their leadership team.

In PISA 2018, Estonia scored the highest in the OECD in reading and science, and the third highest in mathematics. In addition, and following PISA's definitions, Estonia has the smallest share of low achievers in all three tested subjects (4.2%, 13.4% on average across OECD countries), and a significantly higher than the OECD average share of top performers (22.5% in Estonia vs 15.7% in the OECD) (OECD, 2019<sup>[7]</sup>).

Socio-economic status<sup>1</sup> had one of the lowest impacts in the OECD on reading performance in PISA 2018, explaining 6.2% of the variance in performance (OECD average: 12%). As a consequence, Estonia has one of the highest share of resilient students in reading, with 15.6% of its disadvantaged students scoring among the top quarter of students in all participating countries (11.3% in the OECD) (OECD, 2019<sup>[7]</sup>).

While PISA 2015 showed there was no significant gender difference in science performance, there is in PISA 2018 a significant performance gap in reading between boys and girls of 31 points, in line with the OECD average. Performance differences between immigrant and non-immigrant students<sup>2</sup> are around the OECD average. Immigrants scored on average 39 score points lower than non-immigrants in reading in PISA 2018, compared to the OECD average of 42 score points (OECD, 2019<sup>[7]</sup>).

Part of the Estonian education success lies in the quality of the teaching workforce. According to the Teaching and Learning International Survey (TALIS) in 2014, Estonian teachers had the second highest professionalism index<sup>3</sup>, behind the Russian Federation

(OECD, 2016<sub>[8]</sub>). According to some stakeholders met during the OECD assessment visit, the teaching profession has been highly valued historically: during the previous regime, it was common practice to select among the best candidates of each cohort to become teachers. With an ageing teaching profession at present (44% of primary teachers and 53% of secondary teachers are over 50 years old (OECD, 2019<sub>[9]</sub>)), many would have been trained and selected then.

At present, however, there are concerns, as only 14% of lower secondary education Estonian teachers reported that they agree or strongly agree that the teaching profession is valued in society (the TALIS average being 30.9%) (OECD, 2014<sub>[10]</sub>), and only about 1.4% of 15-year-old students want to become teachers, one of the lowest shares among countries participating in PISA and well below the OECD average of 4.2% (OECD, 2019<sub>[7]</sub>). Moreover, despite a change in 2013 in the way teachers' salaries were calculated in Estonia that led to an average salary increase of 35% at all levels from pre-primary to general upper secondary education, teachers' actual salaries are among the lowest of all OECD countries at each level of education (OECD, 2019<sub>[11]</sub>). As the teaching workforce ages, attracting good candidates to the profession becomes necessary, but remains challenging in these conditions, especially in specific fields such as physics or maths where shortages are now pressing, as reported by some of the OECD team met. This could result in a decrease in teacher professionalism and teaching quality, ultimately curbing student's performance.

To summarise, the Estonian education system is characterised by a high level of autonomy of its education institutions. School founders can open schools, and principals exert leadership in a wide range of domains to run them. Students score high in international assessments, and the student economic status has limited influence on students' performance. This success is linked to the high professionalism of an ageing teaching workforce, whose renewal remains challenging.

Given the level of autonomy granted to education institutions, a comprehensive evaluation and assessment framework is necessary to ensure the sustainability of the Estonian education excellence. OECD comparative analysis suggests this framework can include data from a range of levels, including students' assessments, teachers and school leaders' appraisals, school evaluation, and system monitoring (OECD, 2013<sub>[4]</sub>). These tools can be used at different levels to understand better how students are learning, to provide information to parents and society at large about educational performance, and to improve school, school leadership and teaching practices. As part of this, results from system level monitoring are considered critical to establishing how well school systems are performing and for providing feedback, all with the goal of sustaining high quality education. This is reviewed in the next section, which presents the features of the Estonian education system monitoring in a comparative perspective.

## Education system monitoring in Estonia in a comparative perspective

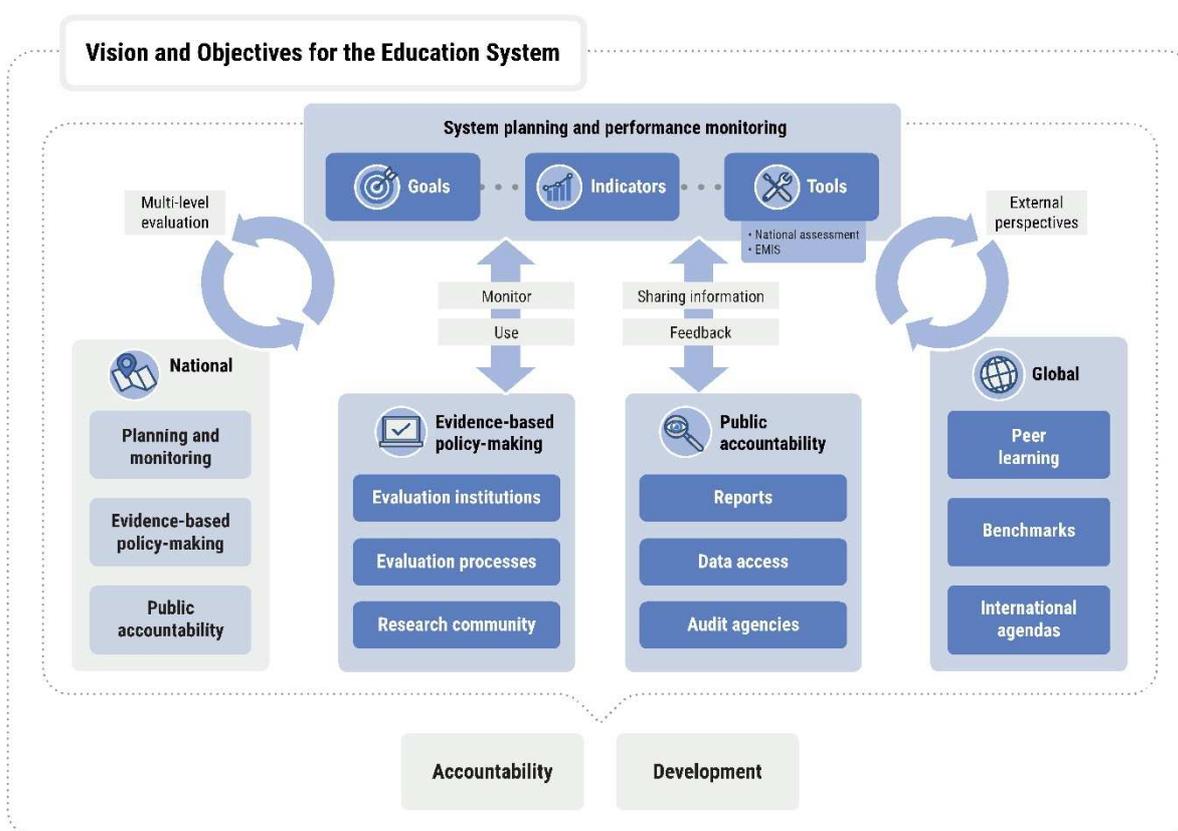
In education, countries use information from a range of sources to monitor and evaluate quality and track progress towards national objectives. The effective monitoring and evaluation of the education system is central to informing policy planning for improvement, as this ensures goals and policies are rooted in evidence, helping to create an open and continuous cycle of organisational learning.

At the same time, governments need to set clear responsibilities – to determine which actors should be accountable and for what – and make information available in timely and relevant forms for transparency and public scrutiny. This provides accountability information to the

public, and can help education stakeholders focus on the major goals and challenges in the education system as a whole.

In many OECD countries, independent government agencies like national audit offices, evaluation agencies, the research community and sub-national governments, play a key role in generating and using available information. The education system monitoring in Estonia is studied here with practices from Denmark and the Netherlands using the OECD’s evaluation and assessment monitoring framework. It refers to goals of the education system, responsibilities for evaluation and assessment, indicators to monitor the system, and tools (Figure 3).

Figure 3. OECD framework for system evaluation / monitoring



### Goals of the education system

The national goals of education are usually broad, inclusive, and stated in an Education Act. They define an education ideal to strive towards, and the organisation and principles to regulate the educational system. Estonia, the Netherlands, and Denmark present their goals in their Education Act and in the Folkeskole for Denmark.

In 2014, Estonia published the Estonian Lifelong Learning Strategy 2020 (LLS), a guiding document for the development of education policy for the period 2014-20. The LLS is aligned to the National Reform Programme “Estonia 2020” and the Estonian national strategy for sustainable development (“Sustainable Estonia 21”). Five strategic goals have been established in the LLS:

- Change in the approach to learning: Implementation of an approach to learning that supports each learner's individual and social development, the acquisition of learning skills, creativity and entrepreneurship at all levels and in all types of education.
- Competent and motivated teachers and school leadership: The compensation of teachers and school leaders including their salaries are consistent with the qualification requirements for the job and the work-related performance.
- Alignment of lifelong learning opportunities with the needs of the labour market: Lifelong learning opportunities and career services that are diverse, flexible and of good quality, resulting in an increase in the number of people with professional or vocational qualifications in different age groups, and an increase in the overall participation in lifelong learning across Estonia.
- A digital focus in lifelong learning: Modern digital technology is used for learning and teaching effectively and efficiently. An improvement in the digital skills of the total population has been achieved and access to the new generation of digital infrastructure is ensured.
- Equal opportunities and increased participation in lifelong learning: All individuals are granted equal opportunities to participate in lifelong learning (Estonian Ministry of Education and Research, 2015<sup>[12]</sup>).

As the LLS was coming to an end, the MoER started preparing a new strategy towards 2035. Three broad-based expert groups (values and responsibility group, welfare and cohesion group, and competitiveness group) were tasked with developing a joint vision on issues that can be influenced by the MoER's four areas of responsibility: education, research, language and youth policy. The resulting vision is represented in Figure 1, where the triangle at the centre encompasses the main targets for Estonian future development: happy learner, inclusive society of welfare and shared values, competitive and sustainably growing economy, and a viable and strong Estonian culture and language. To achieve this four-sided vision, three operational goals were formulated:

- Learning opportunities are diverse and accessible, and the education system enables smooth transitions between different levels and types of education.
- The approach to learning and teaching is learner-focused, forward-looking and helps learners to succeed in life.
- Learning options are responsive to labour market needs (Estonian Ministry of Education and Research, 2019<sup>[31]</sup>).

Other countries establish educational goals in different ways. In Denmark, public primary and lower secondary education is regulated through the Folkeskole Act. The Folkeskole Act sets out the overall goals of the Folkeskole, the responsibilities of the different layers of governance, the subjects to be taught and the learning goals for teaching in each subject ('Common Objectives'). The Ministry of Education introduced the Common Objectives in 2003, revised them in 2009, and simplified them in 2013 as competency, skills, and knowledge objectives.

The Danish government introduced in June 2013, a reform of the Folkeskole based on a broad political agreement by the major political parties to improve public primary and lower secondary education. The reform has been implemented since the 2014/2015 school year. As basis of the Folkeskole reform, the government set three national goals that should

contribute to setting a clear direction and a high level of ambition for the development of the Folkeskole while ensuring a clear framework for a systematic and continuous evaluation:

- The Folkeskole must challenge all students to reach their full potential.
- The Folkeskole must lower the significance of social background on academic results.
- Trust in the Folkeskole and student wellbeing must be enhanced through respect for professional knowledge and practice in the Folkeskole (Nusche et al., 2016<sub>[13]</sub>).

In a different way than Estonia and Denmark, objectives and goals for the Dutch education system are not explicitly stated in a single official document but are inferred from current educational policies and programmes. The definition of student learning objectives at the central level is elaborated in broad core learning objectives for primary and lower secondary education outlined in the Act on Primary Education and the Act on Secondary Education. For the upper cycle of secondary education, learning targets have been translated into centrally set examination programmes. More recently, through the 2010 “Language and Numeracy Act”, the Ministry of Education, Culture and Science developed additional reference levels for literacy and numeracy. These function as “benchmarks” or attainment targets for the knowledge and skills that students are expected to acquire in literacy and numeracy at the end of primary education, and at the end of each of the educational tracks in secondary.

Moreover, the Ministry of Education, Culture and Science is increasingly using Action Plans to express policy agendas. These typically contain specific lines of action and explicit attainment targets, which can be used as further references for education system evaluation. Examples of explicit attainment targets to be achieved at a particular point in time include: specific PISA scores or end-of-primary-education Cito test scores; a given percentage of schools engaged in results-oriented work; a specific decrease of the number of underperforming schools; etc. (Nusche et al., 2014<sub>[14]</sub>)

### ***Responsibilities for education system evaluation and monitoring***

In many countries, an Inspectorate is responsible for school external evaluation and monitoring the education system. Schools have clear guidelines for internal evaluation, and this process sets the foundations for external evaluation. In the Netherlands and in Denmark, a robust accountability system has been established, with the regular screening of all the schools by a central institution, and independent bodies providing external advice on system monitoring and policy making. Similarly in Estonia, an external foundation is in charge of analysing students’ assessments and reporting on the system performance. However, the absence of a legal framework for external evaluation, the advisory rather than coercive role of school evaluation, and the evaluation approach based on a risk analysis, frame a loose accountability system based on shared responsibilities and trust.

There is no separate inspectorate in Estonia; the external evaluation department of the MoER is responsible for education system evaluation. Its major task consists in developing and evaluating the quality systems of educational institutions, which includes managing inspection and analysing results to provide advice to the minister, chancellor, vice-chancellors, counsellors and departments (Estonian Ministry of Education and Research, 2016<sub>[15]</sub>).

More precisely, the external evaluation department of the Ministry is in charge of:

- organising the issuing of education licences to educational institutions,
- organising inspection of education and schooling in educational institutions,
- providing services to the ministry concerning the organisation of supervisory control,
- co-ordinating international surveys in the area of education quality,
- and organising the generalisation and publication of external evaluation results.

The external evaluation department of the ministry delegates to a separate entity, the Foundation Innove, the responsibility to organise the evaluation of the study results of general education institutions, standard determined tests (school stage tests<sup>4</sup>), basic school final examinations and national examinations.

There is no overall framework for education system evaluation in Estonia, but a specific legal framework for school external evaluation. External evaluation of schools is not cyclical, but follows an approach based on thematic evaluations (e.g. professional development for teachers; individualised support for students) which involve a sample of schools. A risk assessment precedes the choice of the schools in the sample. The focus is on the development of schools and supporting their improvement. County governments carry out the regular thematic evaluations through their education departments. At the end of each school year, the county governor submits a summary report to the Ministry of Education and Research. In addition, the External Evaluation Department can also intervene on the basis of specific complaints.

In addition, supervisory control over the lawfulness and efficiency of an educational institution's activities is initialised and carried out by the owner of the institution (in municipal schools by the local municipality, in state schools by the Minister of Education and Research), involving experts of the field, where necessary. Estonian schools are required to draw up a School Development Plan (SDP) for a period of at least three years that must be approved by the school owner. The SDP specifies school goals and objectives, directions for school development (including ensuring safety at the school), and student learning. The purpose of drawing up a SDP is to ensure the consistent development of the school (Parliament of Estonia, 2010<sub>[16]</sub>). Since 2006, educational institutions must also produce an internal evaluation report once during the development plan period, which lasts at least three years. The report should list the strengths and weaknesses of individual schools. There is no mandatory format for the report, but the MoER provides materials to support school self-evaluation activities.

In Denmark, the creation of a new national structure in 2006 has aimed to signal and establish the importance of evaluation and assessment in compulsory education, including: an advisory body with representatives from all the major stakeholder groups to inform the Minister of Education on the quality of the Folkeskole (the Council for Evaluation and Quality Development of Primary and Lower Secondary Education or “the School Council”) and an agency to monitor and develop quality in compulsory education (the former School Agency), the National Agency for Quality and Supervision as of 2011.

The School Council commissions research and documents on “what works” as part of its mandate to follow, assess, and guide the Minister of Education on the academic standard and pedagogical development in the Folkeskole (public schools). The School Council decides the evaluations to be undertaken by the Danish Evaluation Institute (EVA) in the

area of compulsory education. The major collection, processing and presentation of education data is conducted by UNI-C (the Danish IT-Centre for Education and Research), an agency under the Ministry of Education.

The National Agency for Quality and Supervision, which is part of the Ministry of Education, takes the lead on monitoring compulsory education and has responsibility for monitoring compulsory education providers. As such, the National Agency is responsible for monitoring municipalities in the preparation of their biennium development reports (a quality report required by the Consolidation Act on Primary and Lower Secondary Education). The National Agency conducts an annual screening of all public schools (primary and lower secondary education), and where schools show repeated signs of poor quality (non-compliance with legislation or results below national averages), the National Agency staff engages in a dialogue with the relevant municipality about the specific actions to be taken.

An independent state institution, EVA, performs external quality assurance in early childhood and school education to secure and develop the quality of teaching, education and learning in Denmark. EVA gives advice to and co-operates with the Minister of Education as well as other public authorities and educational institutions in matters of evaluation and quality assurance. EVA is furthermore tasked with collecting national and international knowledge on evaluation and quality assurance as well as continuously developing and renewing methods of evaluation and quality assurance (Eurydice, 2019<sub>[17]</sub>).

The responsibility for the evaluation of the Dutch education system is essentially shared between the Ministry of Education, Culture and Science and the Inspectorate of Education. The Ministry's main functions in education system evaluation are: the development of tools to monitor the performance of the education system (e.g. indicators framework, national student assessments, cohort studies), the promotion of evaluative studies of particular aspects of the education system (e.g. policy and programme evaluation), and the use of evaluation results for decision-making and policy development.

In addition, the Education Council (Onderwijsraad), an independent advisory body funded by the government and composed of ten experts, provides independent advice to the government on national education issues. These are typically at the request of the Minister of Education or the Parliament (e.g. review of draft laws). The Education Council has also the right to initiate reviews, investigate specific themes and issue its positions. Recent themes addressed by the Education Council include value-added measurement (to complement growth trajectories), the outsourcing of funding private education, and the decline in reading habits among students. The Education Council is scientific in nature, it does not represent a particular stakeholder group. It seeks to provide a strong empirical basis to its advice.

The Inspectorate of Education assumes the major responsibility for monitoring the quality of education. External school evaluations are carried out by the Education Inspectorate, a semi-autonomous body falling under the Minister of Education, Culture and Science. The Inspectorate conducts a full inspection of every school at least once every four years, the intensity of inspections is based on the outcome of a risk assessment. The identification of schools "at risk" is based on careful desk-based risk analysis using school-level student performance data (such as the end-of-primary test, secondary leaving examinations, and students' more detailed outcomes stored in schools' monitoring systems), documents submitted by schools to the Inspectorate and "failure signals", such as complaints or media news.

The school is accountable to the school owner for its results. The school owner is in turn accountable to the Inspectorate for the quality of education. There are various instruments available for setting and monitoring standards within schools: the school plan, the school prospectus and the complaints procedure. These have been compulsory for primary and secondary schools since 1998. The school plan, which must be updated by the school board every four years and validated by the school owner, describes the steps being taken to improve the quality of education and guides the regular school self-evaluation.

In conducting the school inspection, the Inspectorate relies as much as possible on the results of the school's self-evaluation, but also on available data such as the school leavers' attainment test, the school's student monitoring system, or student portfolios. Since 2016, the Inspectorate makes systematic use of indicators to judge the quality of a secondary school. First, the inspectorate compares the level of third-year secondary students (Grade 9) to the secondary school track advice that was given at the end of primary school. Next, the inspectorate looks at the percentage of students that pass the first year of secondary school without delay and the percentage of students that pass the last part of secondary school without delay. Finally, the results of the national examination are taken into account. These indicators are compared to a standard established by the Inspectorate (Scheltens et al., 2020<sup>[18]</sup>). The inspection results in a public report. The school-owner is then obliged to prepare an action plan for improvement, detailing areas to be monitored, timeline for improvement and schedule for (potential) interim inspection visits (Eurydice, 2018<sup>[19]</sup>).

### ***Selecting indicators to monitor national education goals***

A key challenge in monitoring education systems is to develop indicators and measures of performance that permit a good understanding of how well an education system is achieving its objectives. While national goals are typically comprehensive and broad, monitoring systems may be rather limited in the information they can offer. Estonia is nevertheless at the forefront of developing comprehensive set of indicators to support an education strategy. Denmark is steadily developing capacity in that domain, to tie more closely indicators to policy efforts. The Netherlands already presents various set of indicators associated to policy priorities, but the data collection of original indicators and the setting of policy targets is still work in progress.

The Estonian LLS identifies of a list of indicators to monitor the achievement of the five strategic goals by 2020 (Table 1). This methodology is similar to the one adopted by the European Commission for the Education and Training 2020 framework, where the achievement of 4 common EU objectives (fostering lifelong learning, improving the quality and efficiency of education and training, promoting equity and social cohesion, and enhancing creativity and innovation) is supported by the monitoring of specific indicators. As Estonia is currently refining its Education Strategy 2035, a new set of key indicators needs to be selected, in order to contribute to strengthening education monitoring, promoting school improvement and informing national and local decision-making.

The Danish Government historically managed education statistics through the Database (Databanken), an online public dynamic tool that contains educational statistics across the Danish education system from primary school to PhD (Ministry of Children and Education, Denmark, 2020<sup>[20]</sup>). The database contains a number of regular reports on selected key figures within each educational area. However, the database is gradually phased out as data are progressively transferred or made available in the Data Warehouse, the central application for publication of the Ministry's statistics and data.

Launched in 2014, the Danish Data Warehouse (Data Varehuset) aimed to manage the information linked to primary education, and make it available to schools and municipalities to monitor quality (Ministry of Children and Education, Denmark, 2020<sub>[21]</sub>). It was expanded in 2015 to secondary and vocational education, and has become the primary statistical tool for the Ministry. It gives institutions, regions, municipalities and the public access to a number of predefined reports, graphs and interactive maps with statistical information (Table 2). The data warehouse is thus an open dynamic analytical tool, presenting data at national, relevant geography (region / municipality) and at institution / school levels. It allows comparisons between institutions, and monitoring of developments over time (Ministry of Children and Education, Denmark, 2020<sub>[22]</sub>).

Despite the abundance and diversity of available data, Denmark has not developed an indicator framework as advanced as Estonia to monitor the achievement of the goals stated in its Education Act. The governance-by-data in Denmark relies more on transparency at the local level, which puts pressure on schools (Pedersen and Wilkinson, 2019<sub>[23]</sub>), than on central steering. In fact, the three national goals for the development of the Folkeskole are operationalised through a limited number of clear, simple and measurable targets:

- At least 80% of students must achieve “good” results (ECTS mark C or higher) at reading and mathematics in the national assessments. The baseline is the share of students achieving mark C or higher in the national assessments in 2012.
- The number of high-performing students in Danish and mathematics must increase from year to year. The baseline is the percentage of students achieving the top mark A in the national assessments in 2012.
- The number of low-performing students in reading and mathematics, independent of social background, must decrease from year to year. This target should focus on the percentage of students with parents with only compulsory or unknown education performing poorly in the national assessments.
- The wellbeing of students as measured by a national survey must increase.

Complementary indicators are also presented in the Competitiveness Report that yearly describes the state of growth and competitiveness in Denmark. It includes a clear set of indicators that are used to track the progress of Denmark towards its productivity goals, including in compulsory education. In its 2018 edition, Chapter 5 and 6 (Elementary and High Schools, and Vocational and Higher Education) are dedicated to education, and listed for instance PISA results, public expenditures per student, or the share of 25-34 year old with vocational education (Government of Denmark, 2018<sub>[24]</sub>).

The Ministry of Education, Culture and Science in the Netherlands annually presents in its Budget the most important ambitions and policy objectives. This consists in a dashboard based on two categories: key figures and indicators. Key figures are detailed per policy sector, and support the development of a sector. However, they are not formulated as goals with targets. The policy sectors include:

- Primary school,
- High school,
- Secondary vocational education,
- Higher education,
- Research and science policy,

- Culture,
- Media,
- Emancipation.

Indicators show the yearly progress on 7 policy priorities towards targets (Table 3). They are part of the so called policy agenda, the Ministry's wide formulation of current priorities (Ministry of Education, Culture and Science, Netherlands, 2020<sub>[25]</sub>). In addition, the Education Monitor (Onderwijsmonitor) presents an extensive list of indicators, not necessarily linked to policy priorities, to describe the educational landscape of the country (Ministry of Education, Culture and Science, Netherlands, 2020<sub>[26]</sub>). The Equal Opportunities Dashboard (Dashboard Gelijke Kansen) highlights the indicators connected to the specific equity priority of the policy agenda (Ministry of Education, Culture and Science, Netherlands, 2020<sub>[27]</sub>), and the School Drop-Out Explorer makes available quantitative and qualitative information on school drop-outs at the national, regional, local and school level (Ministry of Education, Culture and Science, Netherlands, 2020<sub>[28]</sub>). The Explorer allows to compare drop-out figures between schools and regions and to observe developments over time, which makes it possible to identify regional and other trends. The tool also includes other relevant information such as examples of promising projects to reduce school dropout.

There are important differences between the Estonian and Dutch strategies outlined in Table 1 and Table 3, respectively. While the Estonian strategy is more comprehensive and includes indicators at all levels of education and across several different areas, the Dutch strategy is mostly focused on vocational education and labour market indicators. The marked difference in scope can also be observed in their choice of teacher-related indicators and priorities. The Dutch strategy focuses on increasing teachers' participation in decision-making and the Estonian strategy focuses on the supply of teachers and the attractiveness of the teaching profession.

Another important difference refers to the timeline: the Estonian strategy lays out a six-year plan and the Dutch strategy corresponds to an annual target. Having a short-term strategy may help monitor progress more closely, but it also creates several challenges. The targets, for example, have to represent a relatively small change compared to the baseline for it to be feasibly accomplished in one year. One of the targets in the Dutch strategy is to increase the "percentage of 25-64 year-olds participating in a learning activity" by one percentage point. It is difficult to interpret such a small change in indicator value, particularly when the indicator is based on a labour force survey and therefore has confidentiality thresholds.

The list of indicators available in the Danish data warehouse does not reflect the government's strategy or policy priorities, but it does highlight what is measured and therefore monitored in the country. Whereas the Estonian and Dutch strategies do not measure education outcomes by students' socio-economic status, this is taken into account in the Danish data warehouse both for student scores and for turnover and transition statistics.

**Table 1. 2020 targets established by the Estonia Lifelong Learning Strategy 2020**

Indicator	Target level 2020 (%)	Starting level (2012) (%)
<b>Key indicators</b>		
Participation rate in lifelong learning among adults (percentage of 25-64 year olds who stated that they received education or training in the four weeks preceding survey)	20	12.9
Percentage of adults (25-64) with general education only (no professional or vocational education)	≤ 25	30.3
Early school leavers (percentage of the population aged 18-24 with at most lower secondary education and not in education)	< 9	10.5
Top achievers in basic skills in: Reading	10	8.4
Mathematics	16	14.6
Science	14.4	12.8
Employment rate of recent graduates (20-34 years old graduates; one to three years after leaving education)	At least 82	73.9
Digital competencies (individuals aged 16-74 with computer skills)	80	65
Comparative general education teachers' salaries (ratio of teachers' salaries to earnings for fulltime, full-year workers with tertiary education aged 25-64)	≥ 1.0	0.84 (2011)
Stakeholders' satisfaction with lifelong learning	Satisfaction has increased	--
<b>I – Change in the approach to learning</b>		
Low achievers in basic skills in: Reading	7.5	9.1
Mathematics	8	10.5
Science	5	5.0
Dropout rate from lower-secondary compulsory education	< 1	0.6
Dropout rate from: Vocational schools	< 20	25.8
General upper secondary education	< 0.8	1.1
Higher education institutions	< 15	21.3 (2011)
<b>II – Competent and motivated teachers and school leadership</b>		
Percentage share of teachers who are aged 30 or below	> 12.5	10.3
Competition for study places in teacher education	Competition has increased	--
Gender distribution of teachers in general education (female:male)	75:25	85.7:14.3
<b>III – Alignment of lifelong learning opportunities with the needs of the labour market</b>		
Share of tertiary graduates in Mathematics, Science and Technology as a percentage of all tertiary graduates	25	22
Share of basic education graduates who passed the career counselling	100	
Share of basic education graduates who continue their studies in vocational upper secondary education	35	28.6
Percentage distribution of upper secondary students by orientation – general:vocational	60:40	67:33
Student mobility	10	3.5
<b>IV – Digital focus in lifelong learning</b>		
Share of students (ISCED 1-6) who use computers, digital and mobile personal devices for studies every school day	100	
Share of Year 8 students at digitally supportive schools	100	33
Share of Year 8 students in schools with a virtual learning environment	100	54
Share of basic education graduates whose ICT basic skills are assessed and certified	100	
<b>V – Equal opportunities and increased participation in lifelong learning</b>		
Tertiary education attainment, age group 30-34	40	39.1
Participants in early education (aged between 4 and compulsory starting age)	95	89.1 (2011)
Share of Russian-language school graduates who master the Estonian language at B1 level	90	56.5
Share of labour costs of governmental education expenditures	60	55 (2011)
Share of teachers' labour costs of governmental expenditures on general education	50	38 (2011)
Optimisation of the use of space in educational institutions (m <sup>2</sup> )	3 million	3.5 million

Source: Estonian Ministry of Education and Research (2014<sub>[29]</sub>), *The Estonian Lifelong Learning Strategy 2020*.

**Table 2. List of the indicators available in the data warehouse, Denmark**

Indicators
<b>Indicators pertaining to primary education</b>
<b>Scores:</b> grades in elementary school and averages, and grades for the socio-economic reference <sup>5</sup> .
<b>National tests:</b> results from the compulsory national tests in Danish and mathematics.
<b>Application and transition to secondary education:</b> applications for 10th grade and secondary education, figures for educational readiness assessments, as well as transition rates for 10th grade and secondary education.
<b>Number of pupils:</b> number of pupils in compulsory school, among others by type of school, grade level and municipality.
<b>Wellbeing:</b> student well-being and general school well-being.
<b>Absenteeism:</b> students' school absenteeism, due to absence of permission, illness, or illegal absenteeism.
<b>Teaching:</b> scheduled teaching hours, proportion of teaching covered by teachers with the adequate teaching skills in the subjects.
<b>Staff and finance:</b> number of employees, students-teacher ratio, proportion of staff working hours spent with students, and the cost of primary school per student.
<b>Indicators pertaining to secondary education</b>
<b>Scores:</b> students' grades, and grades for the socio-economic reference.
<b>Application to upper secondary education:</b> enrolment in secondary education after 9th and 10th grade.
<b>Number of pupils:</b> how many students start, finish, interrupt and complete upper secondary education.
<b>Wellbeing:</b> student well-being and general school well-being <sup>6</sup> .
<b>Students' fields of study and subjects:</b> which subjects and levels do the students in the upper secondary education programs choose?
<b>Staff:</b> statistics on teaching hours such as the proportion of teachers' working hours spent in pupil interaction with a direct learning purpose.
<b>Indicators pertaining to vocational education</b>
<b>Application for vocational training:</b> enrolment in secondary education after 9th and 10th grade.
<b>Internship statistics:</b> information on the development of agreements, school internships and internships in total.
<b>Wellbeing:</b> student well-being and general school well-being.
<b>Number of pupils:</b> how many students start, finish, interrupt and complete vocational education.
<b>Business satisfaction:</b> satisfaction of customer companies (ie the companies that have students in internship).
<b>Turnover and transition statistics:</b> data on completion, dropout and socio-economic background in vocational education programs at both national and institutional level.
<b>Time:</b> data on average hours for the teacher-directed teaching on the basic courses of vocational education.
<b>Staff:</b> statistics on teaching hours, such as the proportion of teachers' working hours spent on learning-related student interaction in vocational education.
<b>Employment rates:</b> employment rates for vocational education graduates.

Source: Ministry of Children and Education, Denmark (2020<sub>[22]</sub>), *Datavarehuset og databanken*,

**Table 3. List of the indicators monitoring progress on policy priorities, the Netherlands**

Indicator	Target level 2019-2020	Starting level 2018-2019
<b>Creating equal opportunities and bringing talents to fruition</b>		
Competency gain between the vocational diploma level and the level of prior education	higher	88%
Completion first year vocational education	higher	84%
Completion first year higher professional education	higher	79%
Number of school leavers	20 000	25 574
% of municipalities offering 960 hours of pre-school to 2.5-4 years old	t.b.d.	-
% of childcare centres offering 10 hours of pedagogical staff member per year per target group toddler	t.b.d.	-
Social inclusion of low literate people	t.b.d.	-
<b>Strong teachers</b>		
% of boards indicating that teachers were involved in a discussion on resources allocation to alleviate teachers' workload.	t.b.d.	-
% of boards indicating that the school council agreed on the resources allocation proposition.	t.b.d.	-
Strategic personal policy	t.b.d.	-
<b>Training for the society of the future</b>		
% of managers satisfied with vocational education	60%	58%
% of prevocational students with a vocational institution within a radius of 10 km around their home	97%	95%
% of science and technology graduates	higher	20%
% of vocational education students in technology	higher	27%
% of vocational education students employed by level of education	higher	1: 59% 2: 80% 3: 88% 4: 90%
% of vocational education graduates who indicates the connection between the study programme and their current position is good.	higher	77%
% of training companies satisfied with vocational education	equal	77%
% of training companies satisfied with professional skills	equal	80%
% of 25-64 year-olds participating in a learning activity	20%	19%
% of higher professional education graduates who are working more than a year after graduation	t.b.d.	89%
... % of them working at least at the level of their degree	t.b.d.	81%
% of university graduates who are working more than a year after graduation	t.b.d.	90%
... % of them working at least at the level of their degree	t.b.d.	72%
<b>World-class research</b>		
% of open access published article	100%	75%
<b>Culture</b>		
% of schools engaged in the Culture Education with Quality programme	equal	50%
% of built monuments in reasonable to good condition	85.5%	84.5%
<b>Media</b>		
Number of performance agreements the Dutch Foundation for Public Broadcasting complies with.	34	33
<b>Emancipation</b>		
Social acceptance of LGBTI people	Equal	90%
% of women on senior position in the labour market	30%	20%

Source: Ministry of Education, Culture and Science, Netherlands (2020<sub>(30)</sub>), *Indicators to monitor policy priorities*.

### *Tools supporting education system monitoring*

The previous sections reviewed how accountability mechanisms and indicators framework are developed to pilot and monitor the education system towards the achievement of specified goals. These indicators rely on national assessments, longitudinal surveys and databases to provide timely and reliable data.

#### *National assessments of student performance*

National student assessments provide information to monitor key outcomes of the education system. They can be administered regularly to provide timely feedback on progress, and allow monitoring student's performance over time. Estonia, Denmark, and the Netherlands have all three well-established cycles of national assessment that provide feedback, comparative data, and feed into the education monitoring system.

In Estonia, sample-based national standardised tests are conducted in Years 3, 4, 6 and 7, the results from which are used for national monitoring. At the end of both basic education and secondary education (Years 9 and 12), national examinations play a certification function.

These assessments are used at the central level for curricula development, teachers' training planning and also for leading the schools risk assessment (for schools) that determines sample school external evaluation. Part of the results are posted on the Education Eye<sup>7</sup> (Haridussilm), an online visual database that allows for the comparison between schools using school background, school environment, and school performance data. The Innove Foundation - a mandated agency in charge of organising the evaluation of the study results of general education institutions, standard determined tests, basic school final examinations and national examinations - undertakes an analysis of these assessments' results, following guidelines prescribed in regulations, and produce a special output in the Estonian Examinations Information System (EHIS).

In Denmark, compulsory national tests were run for the first time in 2010 to provide teachers with a better general assessment of students' learning progress and to follow up on students' attainment of the learning goals specified in the Common Objectives. The average results of Danish students in national assessments are published in the form of national profiles. A "national performance profile" presents a breakdown of student performance in the different areas of the test, plus their overall performance on that test. For example, for the four Danish reading tests (in Years 2, 4, 6 and 8) there are results for how Danish students performed on average in "Language Understanding", "Decoding", "Text Comprehension" and an "Overall assessment" (average performance over the three areas of the test). This "average score" allows comparisons of Danish student performance over subsequent years.

UNI-C calculates every year the national performance profile. The Quality and Supervision Agency publishes yearly on its website the profile for each subject and Form level tested in the national tests to show how student performance evolves over the years. Municipalities have access to national test results for all schools in their jurisdiction and aggregated results for the municipality. Since these results are adjusted for student factors such as gender, ethnic background, parents' education and socio-economic status, municipalities can compare their results to the national profile (Nusche et al., 2016<sup>[13]</sup>).

The Netherlands collects a wide range of data on student performance to monitor learning outcomes at the system level. Information on student learning outcomes is collected from

monitoring sample surveys, standardised student assessment and national examinations at the end of secondary education.

The Annual Survey of Educational Levels (JPON), was introduced in 2008 to specifically monitor progress on the roll out of the Ministry for Education, Culture and Science's quality agenda "Schools for Tomorrow", and monitors student mastery of Dutch language and mathematics at two points in primary education (Years 4 and 8). The design of JPON aims to provide more regular and timely feedback on a narrower area corresponding to the national reform agenda in primary education.

In addition, the central authorities are setting national targets for performance based on the end-of-primary test (formerly called the Cito-test). This is a high-stakes test, primarily to advise students on the appropriate secondary education track for them. Since 2014, the test has become mandatory, but given less weight in advising on secondary school choice than the advice given by the school. The end-of-primary test is used by the Inspectorate of Education to compare performance across schools and its aggregate results are often also used to evaluate the impact of a specific policy or programme. Results from the secondary school leaving examinations are also aggregated to the school, regional and national level for accountability and monitoring purposes (Nusche et al., 2014<sub>[14]</sub>).

### *Longitudinal surveys and databases*

Longitudinal surveys or the constitution of longitudinal databases allows to monitor the progress of student cohorts through the education system, or the evolution of the education quality over time. Embodying the concept of e-Estonia and transparency, the Estonian education management information system EHIS provides an extensive set of data, and many services associated to the X-Road infrastructure. To a lesser extent, the online visualisation of school-based monitoring systems in the Netherlands, and the current migration of Danish education data registers to a better online visual tool, also demonstrates the level of transparency of the systems.

In 2004, the Estonian MoER piloted the official register "The Estonian Education Information System" (EHIS<sup>8</sup>) to collect information for organising and purposefully administering the education system. EHIS combines data that comes directly from all schools in Estonia. These include all institutions that provide education that follows a curriculum. In total, about 2,000 institutions enter data into EHIS. By law, all schools are required to enter the data and keep it up to date, and school principals required to nominate at least two employees who are responsible for EHIS data (OECD, 2020<sub>[31]</sub>).

EHIS consists of five sub-registers:

1. the sub-register of documents certifying education: records are kept of the issuing of graduation documents certifying basic, general secondary, vocational secondary and higher education, and of reports proving the completion of residency,
2. the sub-register of teachers: contains information on teachers and head teachers, including their qualifications, and the subjects / level / school they taught during their career,
3. the sub-register of pupils, university students and resident physicians: records are kept of pupils, students, external students and resident physicians acquiring pre-primary, basic, general secondary, vocational secondary, and higher education,
4. the sub-register of educational institutions: records are kept of educational institutions enabling the acquisition of pre-primary, basic, general secondary,

vocational secondary, higher and hobby education, and of general data and the inventory required for education and schooling in these institutions;

5. the sub-register of curricula and education licenses: contains information on the curricula, programmes and education licenses of educational institutions enabling the acquisition of pre-primary, basic, general secondary, vocational secondary, higher and hobby education or in-service training.

In addition to the aforementioned information system, several other registers are also kept; the following of them are related to education:

- the register of research and development institutions<sup>9</sup>,
- the results of state examinations (not a public register but all examinees can find out their examination results here),
- the register of professions<sup>10</sup>: lists all the existing professional councils,

EHIS provides everyone with an opportunity to review the performance indicators of educational institutions. Data established by the minister's regulation are available for each educational institution on a dedicated website<sup>8</sup>, and is used in particular for:

- making policy and financing decisions in education and other tasks arising from law,
- developing state and international educational statistics,
- monitoring the progress of the Lifelong Learning Strategy through selected indicators,
- other analysis and studies of developments in education, including background data and samples for research,
- X-Road based services<sup>11</sup>,
- quality assurance in higher and vocational education: background data for internal evaluation reports,
- transparency: educational institutions and school owners have access to all of their data and data concerning their students and teachers.

The MoER has developed a more user friendly tool, the Education Eye, for the public to access the databases stored in the EHIS. The Education Eye allows visual representation of the different databases related to the education system. It presents characteristics pertaining to students, teachers, teachers' salary analysis, education expenditures, teaching staff, research, and performance indicators.

In Denmark, UNI-C, the Danish IT-Centre for Education and Research, develops and maintains the educational databases of the Ministry of Education. All the education registers build on a unique personal identification number in the Civil Registration System (Det Centrale PersonRegister number or CPR-number) that covers a range of information about every individual such as the name, the address, the marital status etc. All individuals attending education in Denmark are automatically included in the registers, and their information linked across years. There exist several education registers in Denmark (Student, Attainment, Transition, Exit, and Qualification registers), and for brevity reasons, this notes focuses on the two main registers.

The Students Register, established in the early 1970's, is a longitudinal register that follows the educational careers of students in the mainline education system. The purpose of “the Student Register” is to analyse entrance to, enrolment in, and graduation from the mainline education system as well as transmissions of student within the system. It is based on annual reports from the Danish educational institutions. The majority of data is collected by system to-system reporting. However, there are a few educational institutions which report through web-based questionnaires (Statistics Denmark, 2020<sub>[32]</sub>).

Building on the Student Register, the Attainment register is a yearly updated longitudinal register that stores subject specific marks for the final grades of compulsory schooling and all the formal tests in upper secondary education. It include information relative to tests were oral or written, whether the subject was mandatory or elective. In addition, the Danish Ministry of Education provides all written tests for final grades of compulsory schooling, which eliminates potential differences in tests within one year (Statistics Denmark, 2020<sub>[33]</sub>).

In its annual screening of schools, the National Agency for Quality and Supervision uses the information in municipal quality reports and on the quality indicators fixed over time by the Ministry of Education. They include, for example, the results of national tests and final examinations, enrolment rates in upper secondary education and standardised measurements of student well-being. Agency staff in charge of the annual screening of schools analyses pupils' academic achievements in different subjects in order to assess whether the school is performing as well as the national profile, which takes into account local circumstances such as the social background of pupils in the school (Eurydice, 2019<sub>[17]</sub>).

Schools in the Netherlands have one of the highest level of autonomy in OECD countries (Figure 2), which is balanced by a strong accountability for results (OECD, 2016<sub>[34]</sub>). In fact, the monitoring system in the Netherland is mainly driven by student achievement in standardised testing (national monitoring sample survey JPON, results reported by schools from their monitoring system, and the results from the secondary school-leaving examinations) that allows the Inspectorate to identify low performing schools.

DUO (Dienst Uitvoering Onderwijs), the unit dedicated to information management of the Ministry of Education, Science and Culture, collects student performance data and complements it with a wide range of demographic, administrative and contextual information. For instance, the education databases developed by DUO are enriched with databases from the National Bureau of Statistics (CBS) who collects information on parents (e.g. labour market, population registry), and school finances.

As of 2014, primary schools in the Netherlands are required to implement a longitudinal student monitoring system that consists of formative standardised assessment. Schools have to use these systems to quantitatively assess the progress of their students towards the reference levels. There are three comprehensive student monitoring systems available to schools for this purpose: LVS, ParnaSys, and ESIS. A legacy of the time when the Central Institute for Test Development (Cito) had the monopoly for the end-of-primary test (Cito test), virtually all primary schools participate in the LVS developed by Cito, and schools are requested to periodically send their data in a standardised format to DUO.

For instance, the LVS is a longitudinal student monitoring system and offered for Years 1-8. The tests are taken once or twice a year and are completed by hand or, for some subjects, by using computer-based modes. Tests in ordering, language and orientation in space and time are given in Years 1 and 2 only. For Years 3-5, tests are given in several aspects of

Dutch language, arithmetic/mathematics, and social and emotional development. These tests are also given in Years 6-8, along with world orientation (geography, history, biology), science and technology, and English (Years 7 and 8 only). The formative/diagnostic function is accomplished through provision of interpretive materials, as well as suggestions for relevant pedagogical strategies.

Following the implementation of the unique student identifier, student progress can be analysed as results in LVS tests, end-of-primary and school leavers tests, and national examinations are registered for each student. In particular, scores in LVS tests are vertically equated, which allows the calculation of student growth trajectories<sup>12</sup> in primary education. While there are no intentions to use the LVS results for accountability, the student number can facilitate the longitudinal analysis of student assessment results.

The different databases are connected and made publicly available through an online information system called Windows for Accountability (Vensters voor Verantwoording). This online information system was created at the initiative of the Primary and Secondary Education Councils (the national associations of school boards) to provide information about individual schools. It is subsidised by the Ministry of Education, Culture and Science and managed by the Foundation SchoolInfo (Stiching SchoolInfo). Windows for Accountability brings together central administrative data from DUO, public accountability information and school-based information. It edits and creates visual representations of the data, and a dashboard of twenty indicators supports individual schools in developing quality education (Foundation SchoolInfo, 2020<sub>[35]</sub>).

### Issues for consideration in reviewing monitoring practices in Estonia

Across countries, the positive association between school autonomy and students' performance is conditioned by the level of accountability, the quality of the teaching force and of the support to schools and their staff to be able to respond to autonomy (OECD, 2016<sub>[6]</sub>). Countries seek to strike the right balance between, on one hand, granting autonomy in terms of resources, curriculum, assessment, human resources etc., and, on the other hand, the level of reporting, evaluation, monitoring, and their potential consequences. In Estonia, schools have one of the highest level of autonomy across OECD countries (Figure 2) and are among the best performers in PISA (OECD, 2019<sub>[7]</sub>), and display a loose accountability system based on shared responsibilities and trust.

Against this backdrop, how can Estonia review its monitoring system to meet the goals set in its Education Strategy 2035? Several studies find that to reap the full benefits of school autonomy, education systems need to have effective accountability systems to discourage opportunistic behaviour by school staff, and highly qualified teachers and strong school leaders to design and implement rigorous internal evaluations and curricula (Hanushek, Link and Woessmann, 2013<sub>[36]</sub>). However, tightening the Estonian accountability framework may jeopardise its unique and high performing system built on trust. On the contrary, small adjustments to the existing evaluation and assessment arrangements can be the way forward for Estonia to monitor its education quality efficiently and align it with the new education strategy.

In November 2019, the project team went to Estonia to visit 5 schools and meet key educational stakeholders and policy makers. Following an analysis of monitoring systems in Estonia, Denmark and the Netherlands, and of the information gathered during the study visit, some initial considerations can be made to support Estonia on its next steps with the review of its monitoring system.

In particular at the system level, there is a vast amount of information and data at all levels of the education system in terms of student and school performance and education process and quality indicators. However, an overarching strategy for data use and alignment with the evaluation and assessment framework seems to be missing. Schools mention overlapping data collections between the MoER and Innove, and the proliferation of surveys. The different data gathering processes appear fragmented, and sometimes unfocused to the different stakeholders. Some schools prefer to design their own indicators to monitor their performance, and principals express interest in participating in survey design.

The existing richness of data is reported mainly led by Innove. To support school and education system needs more directly, some suggested tailoring the data further to school needs, for instance, by initiating comparison among similar schools, rather than national average. OECD considers that this can also include developing measures of equity, or stratification by gender/socioeconomic background/minority language, which are not prevalent and do not appear to be considered as a priority by the Ministry or local governments at present. This could contribute to reduce the over-reliance of parents on standardised test information, and highlight the effect of schools on student outcomes. In that sense, the added-value model designed by Innove and the MoER is a very promising development.

In light of the development of the new education strategy 2035, for education stakeholders to engage and progress to accomplish it, schools expressed the need for clear standards of success to benchmark against, such as agreed definitions of excellence and quality education, and examples of successful schooling. School owners may then be able to reflect on school performance, and central support from the MoER could ensure that all schools engage in a significant development plan, especially for more disadvantaged schools. In addition, a coordinated professional development strategy should be integral to any effort to mainstream data use among key actors and endow education stakeholders with the right skills for data assessment analysis (OECD, 2019<sup>[37]</sup>).

The success of the MoER's endeavour to review its monitoring practices will nevertheless depend on the coherence of its implementation strategy. The OECD implementation framework states that a policy is more likely to be implemented if it relies on four dimensions: smart policy design, inclusive stakeholder engagement, conducive context and a coherent implementation strategy (Viennet and Pont, 2017<sup>[38]</sup>). Estonia has already demonstrated very positive results in their monitoring strategy in relation to these dimensions, with a consultation process among stakeholders to establish a consensual vision, a teaching workforce involved and willing to use data, and existing data gathering processes well-anchored in local practices.

However, there is still room for improvement to strengthen its implementation strategy. Among others, and as mentioned earlier, the capacity of the actors supposed to manipulate the data will determine their efficient use. A targeted communication strategy that clarifies to the different stakeholders the purpose of the data development process and its use will increase data reliability and stakeholders' commitment. The institutional support provided by the foundation Innove could be more tailored to the schools' needs, in order for the reporting to feed effectively in a local improvement process. Those are among the questions the MoER could consider as it unfolds its new monitoring system that aims to support Estonian excellence in education. A detailed analysis of current available data, data needs and of practices in the development of monitoring systems in other education systems can provide valuable input into the process.

## Conclusion

Estonia is committed to improve its education governance with the strategic use of relevant evidence and data that aligns to their new vision and education strategy. In this regard, the MoER is now identifying a new set of indicators to monitor the achievement of its 2035 Education Strategy, strengthen decision-making, and define a set of monitoring principles to guide data collection and use.

This note has presented an analysis of Estonia's current education system monitoring practices in a comparative perspective as a starting point for reflection on actions to update the system and indicators to align to its new education strategy 2035. The main conclusions of the analysis show that:

- Estonia has one of the most successful education system among OECD countries, partly due to a highly professional workforce. In highly decentralised contexts, schools autonomy usually comes along with strict accountability (as in Denmark and the Netherlands). This is not the case in Estonia, where shared responsibilities and trust are the norm. The high teaching capacity has supported this equilibrium.
- The renewal of the ageing teaching workforce coupled with a new Lifelong Learning Strategy geared towards 2035 may call for a revision of Estonia's current education monitoring system. Monitoring systems need to align to a vision, have clear responsibilities assigned, and indicators and tools to monitor progress towards the vision.
- Estonia is currently refining its education vision for 2035 and can build on its rich data as well as its strong data development capacity to define an indicator framework to monitor its progress. Moreover, Estonia can build on its current effective tools to support its monitoring system, such as cyclical and well-integrated national student assessments and a cutting-edge education management information system (EHIS). These can be brought together to refine and streamline a set of indicators that can help guide the education system and schools to understand the education vision 2035 and progress towards it.
- Estonia could also draw insights from Denmark and the Netherlands to review its monitoring system. The Dutch accountability framework ensures that school external evaluation results in observable steps for school improvement. The Datawarehouse and the Windows for Accountability present national profiles in Denmark and growth trajectories in the Netherlands, which allow school comparison with peers (Table 4).
- Estonia can build on its strong stakeholder engagement processes to ensure the monitoring system responds to the needs of education stakeholders, especially schools, and is implemented effectively across the country.

As the Education Secretary General Mart Laidmets laid out during the project team visit to Estonia, it is challenging for education stakeholders to navigate among the variety of available data in Estonia, identify what is relevant, and use it appropriately (OECD, 2019<sup>[37]</sup>). Selecting an appropriate set of indicators to guide stakeholders and policy-making, and ultimately monitor the achievement of the new education strategy is a crucial step for Estonia to continue as a high performing education system. This report provides an initial analysis to support the next steps.

**Table 4. Summary of the country comparison of education system evaluation / monitoring**

	Estonia	Denmark	Netherlands
Goals for education system evaluation	Estonian Education Act Estonian Lifelong Learning Strategy 2020 National Reform Programme "Estonia 2020" European Union benchmarks for education	Folkeskole Act Common Objectives	Act on Primary Education Act on Secondary Education Action Plans Language and Numeracy Act Specific policy and programme objectives European Union benchmarks for education
Responsibilities for evaluation	External evaluation department of the MoER Innove Foundation	Ministry of Education School Council National Agency for Quality and Supervision UNI-C (the Danish IT-Centre for Education and Research) The Danish Evaluation Institute (EVA)	Ministry of Education, Culture and Science Inspectorate of Education Education Council Central Institute for Test Development DUO CBS
Indicators	Estonian Lifelong Strategy	4 global indicators Database Data Warehouse Competitiveness report	Policy agenda indicators Education Monitor Equal Opportunities Dashboard Drop-Out Explorer Windows for Accountability
Major tools to monitor performance	National assessments	National (sample-based) standardised tests (years 3 and 6). At the end of both basic education and secondary education (years 9 and 12),	The Periodical Survey of Education (year 8) The Annual Survey of Educational Levels in (years 4 and 8) End-of-primary test (year 8) School leavers test (year depends on the educational stream)
	Longitudinal surveys and databases	The Estonian Education Information System (EHIS)	Student Register Attainment Register
			Longitudinal student monitoring system (LVS, ParnaSys, or ESIS) DUO education databases

<sup>1</sup> In PISA, a student's socio-economic status is estimated by the PISA index of economic, social and cultural status, a composite measure that combines into a single score the financial, social, cultural and human capital resources available to students.

<sup>2</sup> In PISA, immigrant students are students whose mother and father were born in a country/economy other than that where the student sat the PISA test.

<sup>3</sup> The teacher professionalism index is a composite index, created by summing the total number of implemented best practices in three domains: knowledge, autonomy, and peer networks.

<sup>4</sup> School stage test are low-stakes tests that map pupils' knowledge at the end of the first and second stage of studies, i.e., in grades 3 and 6 in maths and mother tongue, and in grades 6 and 9 in science. These tests are not evaluated and aim to provide help and tools for the teacher for further organizing the teaching.

<sup>5</sup> The socio-economic reference is a statistically calculated expression on the basis of the school's student base. The calculation includes factors at the individual level such as gender, ethnic origin and parents' education and income - thus factors that the school does not directly influence. By comparing the socio-economic reference with the actual grades of the school, one can get a picture of whether the school's pupils have passed the final exams better, worse or on a par with pupils at national level with the same socio-economic background.

<sup>6</sup> The aggregate well-being indicators includes four different sub-indicators: "social well-being", "professional well-being", "support and inspiration" and "peace and order".

<sup>7</sup> The Education Eye is accessible at this address: [www.haridussilm.ee](http://www.haridussilm.ee).

<sup>8</sup> The Estonian Education Information System is accessible at this address: [www.ehis.ee](http://www.ehis.ee).

<sup>9</sup> The register of research and development institutions is accessible at this address: [www.etis.ee](http://www.etis.ee).

<sup>10</sup> The register of professions is accessible at this address: [www.kutsekoda.ee](http://www.kutsekoda.ee).

<sup>11</sup> The X-Road is a data exchange layer that was launched in 2001. It is a technical and organisational environment, which enables secure Internet-based data exchange between the state's information systems. For instance, a student fills a study allowance request in the EHIS. The EHIS will update the Population Database, which will update in-turn the Tax Board Database, which takes a final decision and communicates it to the EHIS. The EHIS then directly transfers, or not, the allowance on the bank account of the student.

<sup>12</sup> Growth models involve estimating students' test score trajectories, usually drawing on longitudinal data obtained from annual examinations. Typically, these trajectories are estimated for homogeneous groups of students and enable informative comparisons among groups that are useful for both school self-study and national policy planning.

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