The impact of professional capital on educational excellence and equality in Estonia

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Abstract

Purpose – Estonia's results in programme for international student assessment (PISA) studies between 2006 and 2012 showed both high-level attainment and social equity. The combination of excellence and equity makes Estonia stand out from other countries. The purpose of this paper is to explore the wide range of factors that influence Estonian students' performance in these tests and note how professional capital fits into the overall picture.

Design/methodology/approach – First the authors present a brief analysis of the outcomes in terms of the PISA results. Then the authors describe a wide range of contextual factors in Estonia such as: the country's general level of human development; historical and cultural factors; demographics and social factors. These are the inputs to the education system. Finally the authors explore the interplay between features of the education system itself – the schooling processes – and note the impact of professional capital.

Findings – The authors judge that the interplay between professional capital with other factors that work in harmony explains why the system is highly effective. This coherence is not accidental; it is the outcome of a series of deliberate reforms and investment over a single generation.

Originality/value – Between 2009 and 2012 Estonia increased its share of top performers in PISA tests while, at the same time, reduced the proportion of low performers. This is commonly referred to as "raising the bar and closing the gap". Individual schools struggle to close attainment gaps between different groups of students. Estonia is one of a very small number of countries to achieve both excellence and equality across the whole national system.

Keywords Professional learning, Leadership, Decision making, Community, Professional capital, Knowledge mobilization

Paper type Viewpoint

1. Introduction

Estonia regained its independence in 1991 following the collapse of the Soviet Union. The new government implemented a series of deep reforms to its education system. After 25 years of reform Estonia's education system outperforms not only the other Baltic States and the former socialist countries in Eastern Europe but also most other countries in the Organisation for Economic Co-operation and Development (OECD). It is clearly a highly effective system.

The programme for international student assessment (PISA) is a worldwide study of the performance of 15-year olds in reading, mathematics and science. It is administered by the OECD and over the last 15 years it has become an influential tool to assess and compare member countries' education systems. Government policy makers are forming their decisions using data from PISA

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(Engel, 2015; Froese-Germain, 2010; Neumann *et al.*, 2010). Estonia follows this trend; the national educational strategy "Estonian Lifelong-learning Strategy 2020" indicates, among its key objectives, actions to raise the proportion of students having top-level competencies in mathematics, reading and science (Haridus- ja Teadusministeerium, 2014). Achievement of these national goals will be assessed by PISA results.

Estonia participated in four PISA studies: 2006, 2009, 2012 and 2015 (results to be published in December 2016). The Estonian sample for the PISA 2012 study consisted of 4,779 students (from a total age-related cohort of 12,439 students), of which 79 per cent were taught in Estonian-speaking schools and the remaining 21 per cent were taught in Russian-language schools. Estonian students have consistently scored well above the OECD averages in mathematics, science and reading (see Table I). Estonia is among the four highest performing countries in Europe (see Table II).

The three PISA studies in 2006, 2009 and 2012 indicate consistent improvements by Estonian students (OECD, 2007; Tire *et al.*, 2010, 2013). Estonia has a sizeable Russian-language speaking minority (about 30 per cent of the population). These children follow the Estonian national curriculum in Russian-language schools. Although students

Table I.
The top of PISA 2012 results

	Mathematics		Reading		Science	
	Comparison country/ economy	Mean score	Comparison country/ economy	Mean score	Comparison country/ economy	Mean score
1	Shanghai-China	613	Shanghai-China	570	Shanghai-China	580
2	Singapore	573	Hong Kong China	545	Hong Kong China	555
3	Hong Kong China	561	Singapore	542	Singapore	551
4	Chinese Taipei	560	Japan	538	Japan	547
5	Korea	554	Korea	536	Finland	545
6	Macao China	538	Finland	524	Estonia	541
7	Japan	536	Ireland	523	Korea	538
8	Liechtenstein	535	Chinese Taipei	523	Vietnam	528
9	Switzerland	531	Canada	523	Poland	526
10	The Netherlands	523	Poland	518	Canada	525
11	Estonia	521	Estonia	516	Liechtenstein	525
12	Finland	519	Liechtenstein	516	Germany	524
	OECD average	494	OECD average	496	OECD average	501

Source: OECD (2013b)

Table II.
Highest performing countries in Europe according to PISA 2012

Mathematics		Reading		Science	
Comparison country	Mean score	Comparison country	Mean score	Comparison country	Mean score
Liechtenstein	535	Finland	524	Finland	545
Switzerland	531	Ireland	523	Estonia	541
The Netherlands	523	Poland	518	Poland	526
Estonia	521	Estonia	516	Liechtenstein	525
Finland	519	Liechtenstein	516	Germany	524
Poland	518	The Netherlands	511	The Netherlands	522

Source: OECD (2013b)

attending Russian-language schools in Estonia achieved considerably lower results in PISA tests than students taught in Estonian-language schools, (−31 points in mathematics; −36 points in reading; −35 points in science in 2012) they improved more significantly in the 2012 study with an average increase of 38 points over the 2006 study (Haridus- ja Teadusministeerium and SA Innove, 2013).

What makes Estonia's results in PISA outstanding is the combination of excellence with equity. According to the PISA 2012 results, Estonia had the lowest percentage of students whose results were below the baseline (level 2) in Europe. At the same time the proportions of resilient students is quite high. In PISA studies the term "resilient students" refers to students from disadvantaged backgrounds who are among the highest performing students with similar backgrounds internationally. Estonian resilient students ranked second across Europe in 2012 (OECD, 2013a). Between 2009 and 2012 Estonia increased its share of top performers while, at the same time, reduced the proportion of low performers in science; commonly referred to as "raising the bar and closing the gap". The gap between the performance of rural and urban schools was low (eight points) after accounting for the PISA index of socio-economic and cultural characteristics of students (OECD, 2013a).

We next explore contributory factors connected with Estonia as a country and developments in the Estonian education system which may explain why Estonia is among the highest performers but with lower attainment gaps in PISA studies. Professional capital has made a significant contribution to Estonia's success because it is a complementary factor to a range of other causes. In order to appreciate how professional capital harmonizes with these other factors it is necessary to provide a broader view. By doing so, we indicate other factors that allow professional capital to flourish.

2. Contextual factors influencing the education system (inputs)

2.1 Country's general level of development

According to the United Nations classification, Estonia belongs to the group of highly developed countries (Human Development Report 2015, United Nations Development Programme (UNDP), 2015, p. 242). In 2014 Estonia ranked 30th among 188 countries according to its Human Development Index (HDI). The HDI is a composite measure across key indicators that cover: lengthy and healthy lifespan; education; and standards of living. Students' PISA results are strongly correlated with their country's development level. For example, in 2009 students' reading results from PISA had a correlation, r, with each country's HDI, between 0.7 and 0.74. The HDI explains about half of the variation in students' PISA results between different countries (Mikk, 2015). Estonia shares a common European cultural identity characterized by populations educated to a high level as well as other human development indicators.

2.2 Historical-cultural factors

While Sahlberg (2012) claims that Finland's success in PISA studies is based on the rational education reforms in the second half of the twentieth century, Estonia's success story is quite different. Contemporary Estonian education has developed step-by-step since the seventeenth century. Education for Estonians became available after the Reformation around 1525 when public elementary schools were formed in many places around Estonia to teach reading for Bible study and simple mathematics. It may be reasoned that the Reformation initiated systematic schooling across Estonia (ESTONICA, 2015). The first academic gymnasiums (upper secondary schools for

students aged 16-19) were established in Tartu, 1630, and in Tallinn, 1631, providing the foundation for a massive expansion of Estonian public schools between the years 1686 and 1688 (Andresen, 2006).

The Treaty of Nystad in 1721 transferred Estonia from the Swedish Empire to the Russian Empire. Three years compulsory education for all children, both boys and girls, was underway throughout Estonian territory from 1870 to 1890 (Tannberg and Woodworth, 2010). The Russian census of 1897 indicates that the Estonian population had the highest literacy level (79.9 per cent) in the whole empire, outperforming Moscow (56.3 per cent) and even the capital Saint Petersburg (62.6 per cent) (Karjahärm and Sirk, 1997).

The first gymnasium for girls was established in 1906 with instruction in Estonian. After declaring independence in 1918, "The Law of Public Elementary Schools" was enacted. This enforced six years compulsory elementary schooling based on comprehensive education principles (Andresen, 2006). According to national statistics 96.1 per cent of the population were literate in 1934.

During Second World War Estonia was occupied by Nazi Germany. After the war Estonia was forcibly absorbed into the Union of Soviet Socialist Republics. As part of Soviet Union, seven years compulsory schooling was established in 1949 and from 1958 to 1963 the minimum entitlement increased to eight years compulsory schooling. Educational reforms in 1970s made upper secondary education compulsory; a total of 11 years schooling in Estonia. As a result, 99 per cent of 18-year olds graduated from general or vocational upper secondary schools during the early 1980s (ESTONICA, 2015). Because of several problems related to the quality of education, it was reduced to nine years of compulsory general schooling in 1988. This system is in place today.

The tradition over several hundred years of public schooling valued education in Estonians' mindsets (Rämmer, 2009). Täht and Paškov (2013) state clearly that education remains highly valued in Estonia. Both students and parents hold learning and academic success in high esteem. Teachers also consider high academic achievement as a vital outcome of schooling and an integral part of the school value system. The education system itself supports the overall development of students, including their academic attainments (Ruus *et al.*, 2007; Veisson, 2009).

The history of schooling is an important part of the Estonia's national history and identity. The nation gained its independence in 1918 after centuries of foreign rule. While governed by Danish, Swedish or German lords, Estonians were country folk and less well-educated than their rulers. Education was a privilege about which country folk could only dream (Piirimäe, 1982). Under these circumstances few Estonians were able to fully achieve their educational potential. Gaining independence in 1918, the widely shared dream of universal education became reality through the introduction of comprehensive school principles. During the Soviet Union occupation after Second World War, most young generations had no restrictions on their education despite limitations to their freedom and the lack of democracy. Estonia enjoyed more autonomy in education than other parts of the Soviet Union and this enabled administrators to improve education systematically.

2.3 Demographic factors

The official population of Estonia was 1,313,271 inhabitants in 2015. The populace is fairly homogeneous: mainly Estonians 69.1 per cent and Russians 25.1 per cent. (Eesti Statistika, 2015).

In global terms, Estonia may be considered as a country with well-educated people. Estonia leads the European Union for the percentage of adults between 25 and 64 years old who have successfully completed upper secondary education

(Haridus- ja Teadusministeerium, 2007b). This is confirmed by the OECD in their annual report for 2014 which notes that the level of education in Estonia is one of the highest among all OECD member countries (OECD, 2015). For the students that participated in the PISA 2006 study, their mothers' educational level in Estonia was significantly higher than the OECD average. There was only a very small proportion of Estonian students whose mothers' educational level was below level 3 (upper secondary school) on the International Standard Classification of Education (OECD, 2007).

Chiu and Chow (2010) argue that roles and stereotypes associated with gender in schools damages both boys and girls. Girls' motivation to learn in school falls when their options to be successful in society are low and boys suffer from a lower level of competition with hard-working and bright girls. The gender inequality index (GII) value is small (0.164) in Estonia indicating equity between males and females in the country (UNDP, 2015). Although female workers have significantly lower incomes than males in Estonia, the very high levels of education among females compensates for this and keeps the GII low. Estonia is one of those few countries according to the OECD (2015) where every second female in the age group 25-34 has a higher education degree. Among all active adults (age group 25-64), 45 per cent of Estonian females have higher education, which is significantly more than the OECD average (34 per cent) (OECD, 2015).

2.4 Social factors

One of the reasons for the success of the Finnish education system is that schools provide more than education. In Finland "full-service" schools also provide a daily hot lunch for all students; they have medical services available, including dentistry, guidance and psychological counselling (Sahlberg, 2012; OECD, 2011, p. 122). Similar services are available in Estonian schools: a free hot school lunch for all primary and lower secondary school students since 2006 and also medical and dentist services. Frisold (2015) states that free breakfast increase students' achievements in school. Good nutrition is clearly linked to effective learning.

Many municipalities provide financial support to families with school-age children. For example, in Tartu a family receives 50 euros for each child in the first three years of school (Tartu Linnavolikogu, 2014). In the capital, Tallinn, the municipality provides an allowance of 320 euros to every family at the start of each child's first school year (Tallinn Linnavolikogu, 2014). Here we see that decisions made at both levels of government, across the state and at local (municipality) level, work in harmony to provide students with more equal opportunities for schooling.

In 2016 Estonia ranked 104 out of 144 countries according to its Gini index, the most commonly used measure of inequality (Central Intelligence Agency, 2016)[1]. This position indicates that the national wealth is fairly evenly distributed throughout Estonian society. Studies in different countries indicate that children from low-income families, especially those whose parents are less involved with their education, frequently achieve lower academic results than their peers. These students often have poor attendance at school or miss a significant number of lessons for various reasons and may even be excluded from the school in the worst cases (Ferguson *et al.*, 2007; Woolfolk and Kolter, 2013). Many families in Estonia earn relatively low incomes. In 2013, 22.1 per cent of population had a monthly income less than 358 euros ($452) or 4,300 euros ($5,430) per year (Eesti Statistika, 2015). It is extremely important for these families to have access to kindergarten services that compensate for social deprivation associated with low income. While compulsory schooling (first Grade) begins at age seven, almost all children experience some form of pre-school learning beyond the

home. Kindergarten is government subsidized and parents pay a fee which is less than 20 per cent of the national minimum wage validated by the Estonian Government. The monthly kindergarten fee varies in different municipalities, starting from 0 and rising to 58 euros, depending on the family income. In 2013, 87 per cent of children from birth to age three attended kindergartens; that increased to 93.5 per cent of the 4-7 age range (Eesti Statistika, 2013). Participation in high-quality pre-school education prevents children from relatively disadvantaged backgrounds from falling behind their peers in terms of educational progress during their early years. This has a lasting impact on their learning. Estonian students in the lowest quartile according to PISA's socio-economic index perform higher (495 points) than the overall OECD average.

3. Factors initiated by the education system (processes)

When Estonia regained independence in the early 1990s, the country had a serious challenge to develop and implement new education policies that reflected the changes in society. The education system needed a rapid response to a wide range of issues such as: the formation of a new democracy, more personalized learning, creating a new system of shared values and sustaining the national public school system. Estonia became more autonomous, within the Soviet Union, following the "perestroika" movement during the 1980s. Growing autonomy provided opportunities for leaders and key people in the education system to visit Scandinavia, USA, Canada and other countries to learn about contemporary ideas of schooling and understand different principles (Sarv, 2015). Policy makers were well-placed after independence to shape their new understandings of education into legislation that would move the country forward through the new Republic of Estonia Education Act (Riigikogu, 1992) and the Act of Basic School and Gymnasium (Riigikogu, 1993), which decentralized general education to the school level.

The Estonian school system was decentralized in the early 1990s devolving responsibility for the local school system to each municipality. While Reiljan and Timpman (2015) noted at the turn of the century that decentralization in Estonia was similar to the European average, later studies show that schools have higher levels of autonomy today. The Teaching and Learning International Survey (TALIS) 2013 study indicates that Estonian teachers' autonomy is highest among participating countries (Schleicher, 2016). Estonian school principals have very high levels of autonomy including the authority to hire and fire staff, negotiate working conditions and job contracts (Kitsing and Peterson, 2011; Kukemelk, 2015; OECD, 2014, p. 49; Riigikogu, 1993; Stevick, 2009). Estonia is among those countries where leadership is widely dispersed throughout each school (Schleicher, 2016). However, autonomy at school level is not, in itself, a significant factor in school improvement. Other countries with decentralized systems, such as Sweden, do not perform as well as Estonia. In Estonia, autonomy at school level empowers principals and teachers to self-regulate their own professionalism through the development of professional capital.

Hargreaves and Fullan (2012) argue that professional capital is the product of three parts or conditions: human capital, social capital and decisional capital. We consider the development of professional capital in Estonia's education system through the emergence of each condition. By transferring decision-making power and shifting responsibility for final results to the school level, Estonia has created the third of these conditions (decisional capital) for professional capital to flourish. The development of democratic traditions following independence in 1991 led to the abandonment of authoritarian leadership styles in schools and the evolution of more collaborative forms

of leadership. According to the OECD TALIS the collaborative cultures in Estonian schools are among the highest in participating countries (Übius *et al.*, 2014). Collaborative cultures create more social capital; the second of our three conditions for professional capital. Additionally the ministry of education has reduced reliance on schools' external evaluation during the last decade. Regular inspection of every educational institution ceased in 2006 and it was balanced by placing a duty on each institution to undertake self-evaluation. Furthermore, each school has complete freedom to choose how to evaluate itself, what evidence to gather and how to analyse it in order to assess the school's progress. Schools developed the capacity to lead their own professional development, without state pressure. Increased professional capital and more responsibility at the school level have supported the development of more effective learning environments with high students' achievements.

The decentralization of the education system and the differential growth of professional capital may explain the significant difference in PISA results between Estonian-language schools and Russian-language schools in Estonia. In the PISA 2012 survey, the mean scores of students in Russian-language schools were consistently lower than the mean scores of students in Estonian-language schools: lower in mathematics by 31 points, in reading by 36 points and in science by 35 points (Tire *et al.*, 2013). Carnoy *et al.* (2015) consider that the effect of decentralization may be a contributory and detrimental factor in some cases. For example, the freedom to make decisions at school level allowed Russian-language schools to maintain the Soviet-period approach to teaching and learning. The growth of professional capital depends on the product of three things: more openness and collaboration (social capital); a willingness to participate in professional learning and other forms of in-service training to develop human capital; and local decision making at school level. In general, Russian-language schools were more sceptical about the reforms going on in the Estonian education system after independence and less likely to change. Consequently, the development of human and social capital was more restricted in these schools. In 2009, only 33 per cent of teachers in Russian-language schools were fluent in the Estonian language at C1 and C2 levels. Consequently, about two-thirds of teachers in these schools were unable to participate on in-service training courses offered in Estonian. The language barrier reduces collaboration and isolates these teachers from colleagues in other schools. Several studies show that improvements in these schools were slower than those in Estonian-language schools (Kallas *et al.*, 2015; Masso and Kello, 2010; Sarv, 2015). This argument is confirmed by Henno (2015) who observed, in a doctoral dissertation, that teachers in Russian-language schools tend to use didactic teaching methods more frequently than those in Estonian-language schools. Exploring the differences between high- and low-performing schools, Kitsing *et al.* make direct links with the quality of teaching. While the resources for all schools is equal and both Russian-language and Estonian-language schools enjoy equivalent autonomy, we suggest that differences in teaching quality are related to differences in professional capital and the reasons for this should be explored in greater depth.

3.1 Practice of comprehensive school principles in lower secondary education

Ensuring equity is one of the cornerstones of Estonian educational policy. That principle of equity was written into law through the Act of Basic School and Gymnasium, approved by the Estonian Parliament in 1993. Equity has also been supported by several other legislative acts and different international agreements that the country adopted (Riigikogu, 1993). However the practice, or implementation, of

comprehensive school principles required action across all schools to provide learning environments that meet the needs, abilities and interests of all students.

The variety of students' interests and abilities is frequently wide inside any school within a comprehensive school system. Estonia's National Development Plan for general education 2007-2013 paid particular attention to the early discovery of any special educational needs among young children. Early intervention through precise support matched to children's needs was offered to children in the pre-school ages. Students with special educational needs were monitored closely when they entered the school system and additional personalized support was provided for each individual to prevent them dropping out of the comprehensive school. Estonia is distinguished from other countries in the PISA study by low vertical and horizontal differentiation. For example, in Estonia students are only allowed to repeat a school year in exceptional circumstances (Vabariigi Valitsus, 2011). Horizontal stratification refers to arranging teaching in different ability groups within a grade or education level (OECD, 2014).

Gifted students were considered to be students with special needs and an appropriate support system was planned. This included special educational programs for gifted students and additional financial support to students' scientific schools (extra-curricular science clubs and competitions organized and managed by universities). Sepp notes that gifted students are stretched more by participating in subject-based competitions and this leads them to develop more as independent learners (Sepp, 2009). During the period of the development plan (2007-2013) consulting centres for students (and parents) were established all over the country, providing additional support for students with identified special needs such as: speech therapist, education counsellor who deals with students' social problems and educational psychologists (Haridus- ja Teadusministeerium, 2007a). By 2014 this type of consulting centre was operating in every county throughout Estonia. They develop professional capital through special education consultancy and educational psychology services to small municipalities with less than 350 students (Riigikogu, 2013). Larger municipalities deploy staff with this expertise in schools.

3.2 Output-oriented curricula and modern text-books

Changes in Estonian society before, during, and after achieving independence influenced the creation of a new national curriculum and helped its creators to follow social constructivist ideas, developed by Vygotsky and others, about the importance of collaboration in the learning process (Rouk, 2013). The national curriculum states that the purpose of schooling is to develop Estonian citizens, who will contribute to, and benefit from, their society.

The new national curriculum, agreed by Parliament in 1996, was oriented to school outcomes. It described competencies, or standards, to be achieved at the end of each school stage and provided guidance about how to organize a student-centred learning process in school (Ruus and Timoštšuk, 2014). In 2011 the national curriculum was separated into two frameworks: one for elementary and lower secondary and one for upper secondary. Each framework enabled schools to develop their own curricula taking into account students' interests and opinions and also local cultural differences associated with regions in Estonia. Furthermore, it provided a contemporary understanding of teaching and learning informed by research and created a theoretical basis that supports curriculum continuity and students' progression in their learning. Developing a school curriculum is a good example of professional capital in action.

Just as social constructivism formed the foundation for Estonian educational policy so too did this philosophy grow to influence educational leadership and management. The major study carried out to assess the efficacy of elementary schools (Grades 1-6) states that most class teachers paid much more attention to developing students' cognitive abilities than their social competencies (Uibu, 2009). Teachers' instructional practice is a strong factor influencing school effectiveness and predicting students' learning outcomes (Hattie, 2009; Säälik *et al.*, 2013). Analysis of international comparative studies indicates that Estonian teachers structure their lessons clearly and organize learning activities to develop higher-order thinking, which may explain Estonian students' high performance in PISA studies (Henno, 2015). Additionally, Estonian students have well-developed metacognitive learning strategies, such as planning, monitoring and evaluating their work, which are important supporters of high achievement (Säälik, 2015). Belonging to countries where variation between schools by average results is small it is interesting to note that Estonian students' awareness of metacognitive learning strategies explains 30 per cent of the differences between schools in Estonia and 13-15 per cent of the differences between students within schools (Säälik *et al.*, 2015). This is clear evidence of the value that metacognitive skills add to students' learning. Nurturing students' higher-order skills is a consequence of advanced teaching developed through professional capital.

New text-books were written to support the national curriculum. It was culturally important for text-books to reflect Estonian values after independence because during the Soviet era the majority of text-books were translated from Russian and they conveyed a foreign ideology (Krull and Trasberg, 2006; Pilve, 2010). We should note here that there were some text-books written by Estonian authors for Estonian schools during the 1980s, in particular science and mathematics. High-quality Estonian text-books were appreciated even in Soviet Union; in 1986 an Estonian mathematics text-book for Grades 4 and 5, written by Enn Nurk and Aksel Telgmaa, won a Soviet text-book award. That text-book was published in 1995 in USA (reprinted in 2003) (Nurk and Telgmaa, 1995). Estonian text-books have been listed among the best throughout Europe in recent competitions of learning materials (Best European Learning Materials Awards, 2013a, b, 2014).

3.3 Assessment of learning outcomes

The new national curriculum empowered schools to plan their own schemes of work and design learning activities so that students would meet the national standards. Professional capital was necessary for schools to be able to respond. The external evaluation process started to monitor the implementation of the new national curriculum at state level in 1997. Initially, all students had to take state examinations at the end of upper secondary school. Later on, final exams were introduced at the end of lower secondary with harmonized materials and grade-level tests in the lower grades at the end of each school stage (Grades 3 and 6). It is important to clarify that the purposes of the external assessment of students' learning through level tests and state exams are: to inform students about their progress; to direct the content of the curriculum; to guide the learning process; and to provide feedback to schools.

Schools are not ranked according to their test results. The Ministry of Education and Research analyses the results of a representative sample of lower secondary schools' final exams in order to develop and publish the national averages. It does not publish individual school exam results. A similar approach is used for grade-level tests carried out in Grades 3 and 6. Each school receives detailed feedback about its results but students' and schools' scores are not publicized. Testing in the third and sixth grades is

done by sample so it is not a high-stakes test for schools or students. As already noted, the national averages are published so that schools can compare them with their own results. The final state exam results at the end of upper secondary are analysed and published at school level but schools are not ranked (Haridus- ja Teadusministri määrus, 2015). Although the news media collect the final exam results and rank schools accordingly, the state education policy does not promote similar ranking in order to avoid competition between schools.

The purpose of assessing students' learning outcomes according to the national standards is to provide important feedback, at both country and school level, which will promote school improvement. Schools with cultures of uplifting leadership analyse their results using meaningful metrics and plan activities to support continuous improvement (Hargreaves *et al.*, 2014, p. 130). The Estonian assessment system provides schools with the necessary information about students' academic achievements to support evidence-based leadership and the development of a learning organization. The OECD (2014) argues that school systems where schools have more autonomy will achieve higher results if schools can modify their own curricula by using valid and reliable forms of assessment across schools provided by the State. In Estonia, professional capital drives this at school level.

3.4 Students' support systems in school

Schooling is free in Estonia for all students according to their needs; schools provide all text-books and learning material. Those students who need additional support for their learning have free access to educational psychologists and speech therapists. Social services for students and their families, provided in school settings, were added in the late 1990s. Any students experiencing temporary difficulties to achieve their expected learning outcomes are entitled to free additional learning support outside normal lessons. Schools have the power, through professional capital, to provide extended-day activities for groups of students up to Grade 9. These take place before and after school or in students' free time and include: guidance, mentoring, learning support and help with homework. Students taken into State care because of problems at home receive free meals and accommodation plus social and emotional support with their learning.

3.5 High professional requirements to teachers

Children are taught all subjects by the same class teacher up to Grade 6. From Grade 7 to the end of upper secondary school students are taught by subject specialist teachers. Both class teachers and subject specialists are required to complete master's degrees or equivalent studies. In addition they must obtain a teacher's professional qualification from university or a professional body after learning and displaying a range of pedagogical competencies, skills and abilities that qualify them to teach.

Teachers' pedagogical competencies are described in the teacher's professional standards (Haridus- ja Teadusministri määrus, 2013a). The OECD TALIS 2013 study indicated that most of the teachers in Estonia (89 per cent) have higher education degrees, they have passed teacher education and most of them are qualified in the subjects that they are teaching (94 per cent) (Übius *et al.*, 2014). In the fields that are measured by the PISA study (reading, mathematics and science for 15-year olds), the vast majority of Estonian teachers (94-97 per cent) have appropriate subject-based higher education qualifications (OECD, 2014). It is important to state that most

Estonian teachers (69 per cent) participate actively in different courses to update and extend their learning, especially in the field of pedagogy, despite the fact that they already meet the requirements of the teacher's professional standards. Teachers' professional capital is supported by state-sponsored optional and free courses. The TALIS study indicated that two-thirds of Estonian teachers paid nothing for activities supporting their professional development (Übius *et al.*, 2014).

There are similar rigorous requirements for pre-school teachers. They need higher education and professional competencies that support effective learning in kindergarten (Haridus- ja Teadusministri määrus, 2013b). Well qualified pre-school teachers create appropriate interventions that compensate for the disadvantages caused by children's social background. This early intervention supports students' progress according to their abilities and provides a secure foundation for schooling (Berlinski *et al.*, 2009; Feiring and Louis, 1997).

4. Summary

Education is complex and has connections with many aspects of human life. Therefore it is impossible to indicate a single, or even the main, reason why Estonian students perform so well in international comparative studies. Estonian people belong to Western culture through their beliefs, understanding and shared values. That culture attaches a high value to education and human development. There is a long tradition of schooling in Estonia that has existed for centuries and Estonian people appreciate what education provides. The result of this appreciation is a highly educated population and especially highly educated women who form 84.5 per cent of the teaching profession (OECD, 2014, p. 260).

The importance of education is expressed in decision making at many different levels, cherishing schools and caring for students' learning. The education system today puts the highest priority on learning and this is shared by the general attitude to education in Estonian society. More specifically, learning is supported by educated parents who consider that academic success is vital for life. These widely shared values and understandings about education harmonize with the social and educational support that the system provides to all students and their families, according to their needs. Consequently all students progress with their learning regardless of their home environment. Students' results in the PISA 2012 survey show that the socio-economic background of Estonian students accounts for a low variation of only 8.6 per cent. There are few countries in Europe with a lower variation: Liechtenstein (7.6 per cent), Iceland (7.7 per cent) and Norway (7.4 per cent) (OECD, 2013b).

The Estonian school system is decentralized, inclusive and adheres to comprehensive school principles. There is a widespread public demand for high-quality education. The national curriculum sets high standards and expectations for students' learning. Professional capital is intertwined with a range of factors that support high performance in schools. External evaluations of learning outcomes provide feedback loops that inform higher levels of professional learning for teachers. Collaborative methods and techniques are increasingly used to develop leadership within schools and also between institutions. These dynamics are spreading good practice, in both learning and leadership, throughout the system.

In conclusion, it can be stressed that the political system and legal framework have created education policies that empower schools to design their own curricula and decide themselves how best to educate their students, within a framework of high national expectations. The system of pre-service and in-service training of teachers coupled with ongoing professional learning has broadened the leadership of school

principals and extended the pedagogy of teachers in the way that creates better conditions for students' learning. Professional capital is the essential catalyst. The environment in which schools operate, for example the value system in society and the social support measures, are backing up the aspirations of schools and there is a growing trust between schools and society.

Estonian education has several challenges despite the high performance in PISA studies. The PISA results are lower in schools where minority ethnic students learn. Modern teacher education and in-service training of teachers throughout the country should reduce that gap. Fewer Estonian students perform in mathematics and reading at the highest level in the PISA study despite the country's high average results. That creates a need to exploit more teaching and learning methods which take into account learners' individual characteristics though more personalized learning. As in many other countries, there is a significant difference in reading abilities between boys and girls. Perhaps the solution here, as in other issues of pedagogy, may be found through the development of teachers' own professional learning by focusing on effective learning processes that pay more attention to students' differences, especially those based on students' gender.

Note

1. Gini index measures the degree of inequality in the distribution of family income in a country. The more nearly equal a country's income distribution, the lower is its Gini index. The more unequal a country's income distribution, the higher is its Gini index. If income were distributed with perfect equality the index would be 0; if income were distributed with perfect inequality, the index would be 100 (Central Intelligence Agency).

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