



HARIDUS- JA
TEADUSMINISTEERIUM

Annual analysis by the Ministry of Education and Research 2017, Summary



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The Ministry of Education and Research (MER) is issuing the annual analysis for the third time and its objective is to give an overview of the developments in the fields of education, research, youth and language policy and archiving in Estonia.

Knowledge and information are a significant part of the road to the right decisions. The MER is not the only one that makes decisions in the field of education: we all do. Every fifth person in Estonia goes to school every autumn in a sense – to pre-school, school or university – and they all have family members supporting their decisions. More than every other person takes part in training each year and gains new knowledge. As a rule, employers who have decided something needs to be done better and differently at work are behind this. We think learning is necessary and we want to learn more than people in many other countries shows PIAAC study. The current analysis indicates that more and more young people from other countries are also finding their way to Estonian institutions of higher education. This has been a big decision for them.

The MER wants to support learners, interested people and decision-makers by publishing more and more data about education, research, youth work and language training. The latest additions to the education data environment www.haridussilm.ee established five years ago are the performance indicators of schools and the employment and wage indicators characterising the success of graduates of vocational schools and institutions of higher education on the labour market. These data help schools to assess the effectiveness of the activities and the learners and other parties to make smarter decisions and act on a knowledge basis.

The performance reports of the development plans of the MER (the full texts of which are available only in Estonian under surveys and statistics on the MER website) also include many numbers, results and points to ponder¹. A brief summary of the reports can be found below.

The annual analysis has two objectives. In addition to providing a comprehensive overview of the status of Estonian education, research, youth and language policy and archiving, we take a closer look at certain topics. In 2016, we analysed the seven problems of Estonian education², which by now are very well known to us. They were and most of them still are areas in which we have yet to achieve our goals.

This year we focused on the **five strengths of Estonian education**. These analyses provide a more detailed overview of the topics that have stood out in the areas of responsibility of the MER in recent years by answering the following questions: why is it important, where are we today, what factors influence it, what have we done and, if necessary, what else could we do. A detailed overview of the success of graduates on the labour market has been added to the annual analysis as an extra topic this year.

¹ <https://www.hm.ee/en/activities/statistics-and-analysis>

² The participation of adults in lifelong learning turned from a problem into positive news last year, as participation increased by 3 percentage points in 2016 after a standstill of several years. Regarding the analyses of other problems, the picture is however not so positive. The number of young people with a low level of education is two percentage points higher than we expected. The profession of teacher has not become more attractive despite the rapid increase in wages. There are too few young people who want to go to vocational school after basic school. The level of Estonian language proficiency among Russian basic school graduates is slowly improving, but is not good enough to meet the goal set for 2020 (90% at level B1). It is very good that the reading skills of boys are no longer as far behind those of girls, but as PISA 2015 showed, the gender gap in education remains an issue that needs constant attention. The regionally unequal changes in the number of children and young people keep putting the school network under pressure.

Main messages

The high level of basic education was confirmed in 2016: **Estonian students are among the world's best**. It is equally important that we are able to provide competitive education on later educational levels as well. The general information-processing skills of young Estonians who have graduated with general education or an academic degree are among the best in the world.

The pay rise of teachers remains a priority: the wages of teachers have increased by almost 50% in the last five years and the **pay rise is the fastest among OECD countries**.

Participation of young people in youth work is increasing. Approximately 10% do not participate anywhere. It is extremely important that in addition to acquiring a strong academic education, our young people have the time, interest and opportunities to discover themselves and their interests, and for self-realisation.

The share of STEM fields (science, technology, engineering and math) in Estonian higher education has increased. This has taken a lot of work from the popularisation of science in pre-schools to specialty grants in institutions of higher education. **ICT and its rapid growth stand out in particular**, but technical sciences need similar attention. Graduates in the area of natural sciences have not been as successful in finding employment.

Just 10 years ago we thought that Estonia was not an attractive country to for eign students, but this situation has changed. **Almost 4000 foreign students were studying in Estonia by the start of the 2016/2017 academic year – over four times more than 10 years ago**. Foreign students comprised 8.2% of all university students in the 2016/2017 academic year, which is higher than the average in OECD countries.

Learning pays off, as every additional level of education means a job with a higher salary. This comparison also applies when the salaries of drop-outs and graduates are compared. Graduates at all levels, with the exception of Master's studies, earn up to 50% more than drop-outs depending on their level of education.

Comprehensive overview of the performance reports of the development plans of the MER

Education

- 1) **The share of children aged 4-7 in pre-school education** has increased slightly in recent years and was 93.6% in 2016³. There is no central information about those who do not attend as to whether they go to day care, have not found a place in a pre-school, are at home with their parent(s) or grandparent(s) because their parents prefer this, have moved abroad with their parents without informing the Population Register about this or come from so-called risk families, where parents do not have the strength or skills to look after the children. In 2016 we started cooperating with local governments to clarify this situation.
- 2) The biggest and best news in the area of education last year was the **excellent knowledge and skills of Estonian students on the basis of the 2015 PISA Survey**. In natural sciences, Estonian students are ranked first in Europe and third in the world after Singapore and Japan; in mathematics we are second in Europe after Switzerland (sharing places 1 and 2) and ninth in the world. The functional reading skills of Estonian students rank third among European countries after Finland and Ireland, and sixth in the world.

In comparison with the three earlier PISA surveys (2006, 2009 and 2012), the average performance of Estonian students has remained practically the same in natural sciences and improved slightly in mathematics and significantly in reading. The success of Estonia can be explained by the fact that the majority of our students have acquired basic skills and the proportion of weak students is low in comparison with other countries. However, the share of students with poorer skills has increased in comparison with the previous PISA survey, as has the share of excellent performers (in reading and to a lesser extent in natural sciences).

In addition to excellent results, it is at least as important that we are managing to guarantee equal opportunities for students from different backgrounds: the impact of the parents' background on the student's performance is among the smallest in the world and many students from families with a weak socio-economic background achieve good results. Differences between schools are small, incl. those between country and city schools. Although the difference between the results of Russian-medium and Estonian-medium basic schools has decreased, the average performance of students from Russian-medium schools in the PISA test is still significantly poorer. However, it is important to point out that the results of Russian-medium schools are also very good in the context of the world and above the OECD average.

- 3) **The share of early leavers from education and training**⁴ in Estonia is 11% (according to the Estonian Labour Force Survey). The target of the lifelong learning strategy for 2020 is to have fewer than 9% of such young people. According to the Estonian Education Information System, however, around 20% of young people fail to complete secondary education within seven years of completing basic education, and Estonia is the only OECD country where the share of those completing at least secondary education is decreasing in younger age groups.
- 4) **The regionally unequal decrease in the number of students** places enormous expectations on the continuation of school network reforms. 535 general education schools are operating in Estonia in the 2016/2017 academic year: 351 primary and basic schools; 168 gymnasiums; and 16 adult gymnasiums. There are 454 schools

³ Source: Estonian Education Information System; level of EUROSTAT indicator in 2015: 91.7%.

⁴ Young people (aged 18-24) who completed at most a lower secondary education and were not in further education or training during the four weeks preceding the survey.

providing basic education (incl. gymnasiums that have the basic school level) and 168 schools providing general upper secondary education, incl. 21 pure gymnasiums (only grades 10 to 12), of which 12 are state gymnasiums⁵. State gymnasiums operate in 10 counties and the plan is to establish 24 state gymnasiums by 2023. The number of small gymnasiums with fewer than 100 students in grades 10 to 12 in the 2016/2017 academic year was 73, and 41 had fewer than 50 students (incl. those that are being reorganised). State gymnasiums should guarantee the accessibility of general secondary education with choices in a contemporary environment in every county equally to the upper secondary schools of bigger cities.

The number of general education schools has decreased by 66 in the last 10 years. This decrease has mainly affected municipal schools with the general upper secondary education level – two-thirds of the schools that were operating 10 years ago remain. The number of gymnasium students has decreased even more: by 40% on average, less only in Tartu County and Harju County, but 50% or more in most counties. The objective for 2020 is to streamline the school network further in such a way that there will be ca 100 schools with the general upper secondary level in Estonia.

Demographic forecasts show that the population of Estonia is ageing and the proportion of young people is continuing to decrease. According to forecasts, the number of full-time students in general education will increase until 2023 and the years of fastest growth lie ahead. The number of students in full-time education in 2030 will be approximately the same as now. The number of basic school students will change very differently by region – in the last decade, the number of students has only increased in Harju County and Tartu County, by 22% (almost 10,000 students) and 2%, respectively. The number of basic school students has decreased most in the last decade in Hiiu County (39%), Jõgeva County (36%), Võru County (33%) and Põlva County (32%).

General education schools use more than half of all education infrastructure. If no changes are made to the infrastructure, the already unreasonable use of space will increase by a fifth in all counties, excl. Harju County and Tartu County, by 2030.

- 5) **The distribution of basic school graduates between vocational and general secondary education** has not changed in the past 10 years. The goal for 2020 is to have a ratio of 35/65, but in the past five years, 26-28% and 72-74% of basic school graduates have chosen vocational education and general upper secondary education, respectively. The establishment of state gymnasiums (also the separation of basic schools and gymnasiums, e.g. in Tartu) has not changed the educational choices of basic school graduates in counties in favour of vocational education. The analysis published by the Ministry of Education and Research in 2016⁶ regarding the choices made after basic school indicated that boosting the share of vocational students on the account of general education students is not the best solution considering the goals of economic growth and the conditions outside of the education system. Analyses of the progress of graduates indicate that the risk group consists mostly of young people who did not acquire at least secondary education before entering the labour market. Vocational upper secondary education gives a small advantage over general upper secondary education in terms of income when the person enters the labour market, but further work experience equalises the income. Since general education has been historically popular in Estonia and we have a liberal labour market, achieving the objective with “soft” measures (e.g. advising people and improving the reputation of vocational education) is probably impossible.
- 6) **The objective of educational guidance and career counselling** is to reduce the proportion of young people with a low level of education and the drop-out rate. The premise is that the drop-out rate is reduced by conscious career and specialty choices as well as the implementation of support measures in the case of students with

⁵ As a rule general education schools are managed by municipalities. State has decided to establish at least one strong gymnasium managed by state in each of 15 counties.

⁶ Read the survey here: https://www.hm.ee/sites/default/files/haridusmin_pohikoolijargsed_haridusvalikud_30112016.pdf

learning difficulties so that they can participate in learning according to their abilities. The state is aiming for inclusive education, which primarily means the broadest possible inclusion of students with special educational needs (SEN) in ordinary schools. Noticing special needs at the right time and offering the necessary support is important.

The counselling will take place at two levels: primarily in schools and secondly in *Rajaleidja* centres⁷. The system was launched in 2014. While the achievement of goals was difficult in 2015, i.e. the first year of full operations, the number of children, learners and young people who received individual educational guidance and career counselling doubled (exceeding 55,000) in 2016. The work of the *Rajaleidja* centres in counselling parents and educational staff is considerably more extensive than planned. *Rajaleidja* centres have reached most small schools: 271 of 293 small schools used the services of the centres in 2016, which also exceeds the target level set for 2020.

The main obstacle in the area of counselling is the shortage of educational guidance specialists, especially special education teachers and psychologists. **According to estimates from different sources, 40-60% of schools have problems with the accessibility of school-based support services.** Estonian Centre for Applied Research Centar prepared a survey of SEN students in 2016⁸. According to the survey, parents were satisfied with the selection of support services currently offered and felt that schools and teachers usually have every possibility to support students. Unfortunately, satisfaction with the quality of the services was not uniformly high. The criticism of parents concerns the provision of SEN support measures and especially the unsatisfactory support of teachers of SEN students attending ordinary schools.

- 7) The share of those **aged 30-34 with higher education**, which was 45.4% of the age group in 2016, has increased. The target for 2020 is 40% for both Estonia and Europe. The gap between the proportions of men and women with higher education remains large: 38.8% of men and 52.4% of women aged 30-34 have higher education. However, the proportion of men with higher education in this age group has increased in the last five years: the indicator in 2011 was 30.6% for men and 50.5% for women.

Although not all higher education graduates immediately find work suited to their level of education, the PIAAC survey shows that over-education among young people with higher education in Estonia is less of a problem than in OECD countries on average. The reports prepared on the basis of the OSKA system for forecasting the need for workforce and skills also suggest that the number of newcomers with higher education does not meet the needs of the labour market.

Since the share of upper secondary school graduates who continue their education in Estonian higher education institutions has decreased by *ca* 10% since 2010 (with 62% of upper secondary school graduates continuing their studies in the same year in Estonian higher education institutions in 2010 but only 52% doing so in 2016), it can be assumed that the share of people with higher education will also start decreasing.

- 8) **The short-term learning mobility of Estonian students** or, to be specific, the number of mobility grants among all students was stable from 2011-2014 (3.3-3.6%). The methodology changed in 2015 and account is now kept on the basis of the results of university students recorded in the data of the Estonian Education Information System (EHIS) instead of the existing mobility grant-based calculations made by Archimedes. Consequently, the indicator has decreased to a considerable extent (2015: 1.4%; 2016: 1.8%).

The **number of foreign students** has more than doubled in the last five years (2011/2012: 1573 foreign students; 2016/2017: 3917). Foreign students already comprise 8.2% of all university students in 2016/2017.

⁷ *Rajaleidja* (Pathfinder) centres established in all counties provide both career and study counseling for youth, their parents and schools.

⁸ The analysis in Estonian: <http://dspace.ut.ee/handle/10062/55400>

The share of foreign students in Master's and Doctoral studies is around 14%. Last year, foreign students also comprised 7% of all graduates. The 2015 overview of the National Audit Office about the state's migration policy choices refers to massive unused potential: although the number of foreign students who come to study in Estonia has increased, only a fifth of them find permanent work in Estonia after graduating. The differences between various fields are remarkable, e.g. ca 50% of ICT graduates find jobs in Estonia (according to reports of StudyITin.ee).

Both short-term mobility and the number of foreign students are likely to increase as a result of the new **financing model** established in 2016, which is aimed at motivating higher education institutions to contribute more to the achievement of strategic goals. According to the model, up to 17% of funds will be allocated on the basis of the achievement of six performance indicators. These indicators are the share of students who graduate after the standard period of study; the share of students admitted to the area of responsibility⁹; the further education or employment of graduates; the ratio of the private money received from academic activities to the operating subsidy; the share of students who participated in short-term mobility; and the share of enrolled foreign students.

- 9) **The share of graduates in STEM fields (science, technology, engineering and math)** in higher education has remained close to 25% in recent years, which is also the goal set for 2020. The share of STEM graduates in 2016 was 27.4%¹⁰. Increasing the share of STEM graduates has been set as the target considering the need for the replacement of workforce and an increase in productivity.

The average wages of graduates with higher education in STEM (2005-2014) in 2015 were 1425 euros and 1262 in other areas, but there are also areas with lower wages among STEM: the average wages of ICT graduates from 2005-2014 were 1807 euros in 2015, but only a little over 1000 euros in the area of environment. The number of ICT graduates has increased by approximately one quarter in the last year.

The share of STEM graduates in higher education has been influenced by specialty grants, the programme of the IT Academy, incl. the support of the sector's companies for the programme, the measures for popularisation of STEM and science and the measures that support the internationalisation, mobility and next generation in higher education. It is positive that early interest in STEM has increased in recent years: according to the 2015 PISA Survey, 25% of 15-year-old Estonian students would choose a profession related to natural sciences at the age of 30, and the share of such students in the 2006 PISA Survey was 21%. In comparison with neighbouring countries and the OECD average, the number of students who would like a career in ICT is highest in Estonia (8.1% in Estonia; 2.6% OECD average).

The conclusions of the working group of economic development published last year¹¹ included the proposal to set 35% as the goal in terms of STEM graduates instead of the current 25%. Achieving such a high target is probably unrealistic for the coming years, but we hope to reach 29% by 2020.

- 10) **Teachers' salaries have increased by more than 50% over the last five years:** the average gross monthly salary of a municipal school teacher was just over 800 euros in 2012, but it had increased to 1206 euros by 2016 and comprised 105% of the average salary in Estonia. Increasing teachers' pay continues to be a national strategic objective. By 2020 the aim is to achieve a situation where the average salary of teachers is equal to or higher than the average salary of an employed higher education graduate. and comprises 120% of the average

⁹ The areas of responsibilities were divided between higher education institutions in order to decrease the overlap in teaching provisions between different institutions.

¹⁰ The share of curricula in the area of STEM increased a little in relation to the implementation of the new version of the education classification system ISCED-F 2013, and the share of STEM graduates therefore also increased by 2%. According to the old ISCED, the share of STEM graduates in 2016 would have been 25%.

¹¹ <https://valitsus.ee/et/uudised/toogrupp-pakkus-valitsusele-valja-80-tegevust-majanduse-elavdamiseks>

national wage. The salaries of teachers working in kindergartens are considerably lower. The average gross monthly salary of municipal pre-school teachers in 2015 was 753 euros, which is 312 euros less than the national average.

In this area, another target is to have the share of labour costs in the education-related costs of the general government sector at a level of 60% by 2020. In 2015, labour costs were at their highest in recent years – 68.4%. The share of the labour costs of teachers in the general education costs of the government sector has also increased (from 36% in 2012 to 47% in 2015).

Irrespective of the pay rise of teachers, **the job of a teacher is (as yet) not very attractive** and the indicators of teacher training (share of young teachers, gender division and entering teacher training) have not improved. A survey carried out by TNS EMOR in 2016¹² indicated that 16% of gymnasium students would like or rather like to work as a teacher in the future, and a little over half (55%) of teachers would choose teaching as their profession again.

The reputation of teaching is “not associated with the respectability and social contribution of the profession, but the large workload, stressful communication with various stakeholders and low wages” (EMOR 2016:39). Looking at the ratio of teachers and students in Estonia, the uneven distribution of the workload in different schools and regions seems to be the problem.

The admission data of universities also indicate that teaching is not an attractive profession. According to the Admissions Information System (SAIS) for 2016, competition to enter teacher training curricula was smaller than average – if we equalise average competition to 1.0, the total competition in teacher training curricula was 0.9. Competition in the curricula of pre-school teacher training was higher than average (1.3) and in the curricula of general education and vocational education teacher training it was 0.7. A new initiative aimed at valuing the profession of teachers and making it more attractive will be launched in 2017.

- 11) **The share of adults (aged 25-64) with no professional or vocational training** was less than 28.5% in 2016 and has remained at a similar level for the last 3-4 years. People with basic or lower education are the most vulnerable on the labour market. The share of such people among adults without professional and vocational education aged 25-40 is more than half.

In order to reduce the share of people without professional or vocational education, it is important to reduce the number of drop-outs from formal education and to increase the share of adults in vocational and higher education. A positive trend in recent years is the rapid increase in adults (25+) in vocational training: their share had increased to 35% or 8801 learners by 2016 (compared to 17% or 4767 learners in 2010). The share of drop-outs in vocational training has also decreased – it was 22% in 2016 (from 28.5% in 2011). At the same time, the share of adults (30+) in higher education has decreased a little in terms of numbers (ca 12,300 in 2016) but increased as a share considering the rapid decrease in the number of learners, comprising 25% of all university students last year. The share of drop-outs at the start of studies (22% last year) has remained unchanged in higher education. The goal set in the lifelong learning strategy for 2020 is to reduce the share of adults without higher and vocational education to 25%, which is difficult to achieve.

- 12) **The participation of adults (25-64) in lifelong learning** saw a pleasing increase last year and was the highest of all time. During the four weeks preceding the Estonian Labour Force Survey¹³, 15.7% of adults were acquiring further education in the adult education system or participated in training; the earlier share of participants was

¹² The survey in Estonian: : <http://dspace.ut.ee/handle/10062/51771>

¹³ The situation on the Estonian labour market is assessed with the survey. The collected data is used to monitor the status of the economy and the labour market and to assess the impact of national policies.

ca 12%. The rate of participation in lifelong learning has increased mainly on the account of participation in informal education. According to the type of training, work-related courses comprised 57.1% of all courses (51.4% in 2015).

The increasingly active participation of people with a low level of education (basic education and lower) and older people in lifelong learning is very positive. While just 1.9% of people with a low level of education participated in lifelong learning in 2010, this number had more than doubled by 2016 (4.9%). Participation in the 44-54 and 55-64 age groups has almost doubled in the last year.

The free in-service courses offered by the MER have certainly contributed to the participation of adults in lifelong learning. 11,947 adults acquired new skills on free courses in 2016, 11,237 (94%) of them obtaining certificates. These training courses were aimed at specific target groups: adults without professional education, adults without secondary education and adults with outdated skills aged 50+. The training courses were prepared according to the conclusions of the OSKA reports to ensure that they complied with the needs of the labour market.

- 13) **The share of Russian-medium basic school graduates who have achieved at least B1 proficiency in Estonian** has increased in comparison with 2011 (56% in 2011; 61% in 2016), but achieving the target for 2020 (90%) is unrealistic at this speed. In order to better reflect the development of the Estonian language skills of all students with non-Estonian background irrespective of whether they study in Estonian, Russian-medium or language immersion classes, we also monitor the Estonian language skills of basic school graduates whose **home language is not Estonian** – 69% of whom reached at least the B1 level in 2016. Participation in the language immersion programme (90% reach at least B1) and the acquisition of education in Estonian (99%) produce the best results. As at 2016, 20% of all full-time general education students whose native language is not Estonian study in language immersion and 8% in Estonian-medium classes.

The Estonian language skills of upper secondary school students have improved **since gymnasiums made the transition to learning in Estonian**. The first young people who completed at least 60% of studies at general upper secondary level in Estonian graduated in 2014. 23% of the graduates failed to achieve B2 language proficiency at that time, by 2016 the failure rate has declined to 17%.

Approximately 15,000 teachers are working in Estonian general education schools in the 2016/2017 academic year, 93% of whom comply with the language proficiency requirements. 94% of the 2200 teachers in vocational educational institutions and 91% of the 8000 teachers in pre-school children's institutions comply with language proficiency requirements. The number and share of teachers who comply with the Estonian language proficiency requirements in all school types has increased slowly in recent years.

Youth affairs

- 1) When the current situation in youth affairs is assessed, it must be kept in mind that the number of young people has decreased by ca 20,000 in the last five years (aged 7-26) and their share in the population has dropped from 23.3% to 21.5%. The number of young people living in Estonia in early 2012 was ca 303,000, but it had dropped to 283,350 by early 2016. According to the forecasts of Statistics Estonia, the share of young people among the total population will continue to decrease until 2022.
- 2) The results of youth work have been positive in the last five years. **Participation of young people in youth work** (i.e. the proportion of young people participating in hobby education, hobby activities, the work of youth centres, etc.) has increased: from 37% in 2010 to 50% in 2016. The goal for 2020 is 60%. More than half of all hobby school students study in the field of sports, and almost a third in the fields of music and art.

Participation in other fields is smaller. The rate of participants in the fields of technology and nature is particularly small: only a little over 3% of all hobby school students. The survey carried out in 2016 in order to map a sub-part of youth work – **hobby activities and hobby education** – indicated that approximately 40% of Estonian young people aged 7-26 participate in hobby education and hobby activities and that the share of participants among young people attending general education schools exceeds 50%.

- 3) The **regional accessibility of youth work**, measured by the number of young people per hobby school (475) and youth centre (1077), **has improved** significantly. The targets for 2020 are 400 and 1000, respectively. The number of organised participation opportunities (youth councils etc.) is a challenge. There were 90 of them in 2015 (the target for 2020 being 200), but a positive shift has occurred here as well in the last year.
- 4) The satisfaction of young people with youth work was measured for the first time in 2015. The average satisfaction rate was 86% for all activities (the share of those satisfied or very satisfied) while **91% are satisfied (incl. 64% very satisfied) with hobby education activities** in particular.

Research

- 1) There are several indicators in research that reflect the **excellence of Estonian researchers**. The success of Estonian scientists in applying for international research projects was remarkable in 2015: the research money won in the European Union (EU) research and development framework programme Horizon 2020 was 1.5 times more than the EU average per resident. Publishing activity, which reflects the activity of scientists and the high level of science, has increased (to 1493 peer-reviewed articles per million residents in 2015¹⁴). This allows us to hope that the goal set for 2020 (1600 articles) will be achieved. The goal set in the Estonian Research, Development and Innovation Strategy (RDI Strategy) for 2014-2020 is to reach a level where 11% of Estonian peer-reviewed scientific articles are among the 10% most quoted articles in the world. It has remained between 7-8.5% in the last year and was 7.3% in 2015 according to the European Innovation Scoreboard 2016¹⁵.
- 2) In the last four years, the **share of high-tech exports** has accounted for 14% of total exports (2015: 15.4%) and in 2014 we surpassed the EU average as well as our own target for 2020: 15%. The share of high- and medium-high-tech sectors in total employment has grown from 5.7% to 7.6% in the past five years (2015) with the goal for 2020 set at 9%. The contribution of science to the economy is indirectly demonstrated by the level of productivity of business entities per employee (% of the EU average), which was 72% in 2015 and lower than the goal set for 2020 (80%).
- 3) In addition to the above, 2016 was also significant for **several important decisions** that will determine the success of science in the future. The biggest financing decisions made in 2016 included the institutional development programme for research institutions and higher education institutions (ASTRA), which supported seven investment projects to a total value of 54.1 million euros. The development of the quality of the academic and research work of universities and research institutions is supported in addition to infrastructure. 20 research institutions and universities in total will receive support for content activities to a total value of 67.4 million euros, plus the support granted to research centres of excellence and the plan of research

¹⁴ This figure is set to change, as not all of the articles have yet been approved.

¹⁵ It is important to add that the data of the European Commission differ significantly from the data of the OECD. According to the OECD, the relevant indicator of Estonia is 13.5%, which exceeds the global average (10%) and surpasses countries like Italy, France, Slovenia, Korea and Japan. Source: OECD and SClmago Research Group (CSIC) (2016), Compendium of Bibliometric Science Indicators. OECD, Paris. <http://oe.cd/scientometrics>.

infrastructure investments of national importance. Increasing core funding for research by 8 million euros as of the 2017 state budget was agreed in the state budget strategy in 2016.

- 4) The **level of research and development (R&D) investments in Estonia** has been declining since 2012: from 2.31% of GDP (2011) to 1.5% (2015), incl. a decrease in business sector investments from 1.48% to 0.72%. The goal for 2020 is for private-sector R&D costs to be at least two-thirds, i.e. 67%, of our total R&D costs. The contribution of the private sector in 2015 was less than half. Moreover, R&D commissioned from the public sector by the business sector remains low, representing just 4.6% of the R&D volume of the public sector. The target for 2020 is 7%. However, this was the best level in the last five years. The Estonian R&D system is highly project-based and characterised by a large share of foreign sources of funding (structural funds and Horizon 2020), especially in the case of research and development in the public sector.
- 5) **The number of Doctoral graduates** was 239 in 2016. This is the highest indicator in the last five years, but the target set for 2020 (300 graduates per year) remains distant. One of the drivers that will enhance the effectiveness of PhD programmes may be the fact that the number and share of foreign PhD candidates has grown exponentially in the past five years: 14% of Doctoral students in 2016 were foreigners. It is necessary to turn attention to ways in which their potential after graduation could be realised in Estonia
- 6) **Estonia's ranking on the European innovation scoreboard** is stable – for the past five years we have ranked 13th or 14th; the goal for 2020 is to rank 10th. However, Estonia was classified as a “moderate innovator” in 2015, which is a step lower than the earlier category of “followers of innovation”.

Estonian language and language skills

- 1) The indicators of Estonian as **native language skills** are stable or positive, e.g. the results of the final examinations in upper secondary schools and basic schools have seen stable improvement in the last 10 years. In comparison with the 2006/2007 academic year, the result of the final basic school examination is better by 8 points (64 points out of 100) and the result of the final upper secondary school examination has improved by 7 points (77 points). The results of the last PISA survey also indicated an improvement in reading skills, as Estonian students earned 18 points more than six years ago and 3 points more than three years ago. It was mainly the reading skills of boys which had improved.
- 2) **In Estonian language learning outside of Estonia**, the number of students learning Estonian at foreign universities (950 in the 2016/2017 academic year) and children learning Estonian outside of the country (3500) as well as the number (80) of general education institutions and Sunday schools, kindergartens, playgroups and language courses offering Estonian language learning in foreign countries have all increased in the past five years. Learning Estonian language and culture is supported in 30 different higher education institutions outside Estonia, incl. nine with lecturers from Estonia.

An impact assessment of the Compatriots Programme was carried out in 2015¹⁶ and the central conclusion was that the programme and the activities it supported are necessary to help compatriots maintain a connection with Estonia and Estonian culture and preserve the cultural heritage of Estonian expatriates. The

¹⁶ Read the survey here: <https://www.ibs.ee/publikatsioonid/rahvuskaaslaste-programmi-moju-uuring/>

most important activities for Estonians living abroad are those that allow them to actually spend time in Estonia (learning, apprenticeships in companies and language camps).

An estimated 150,000-200,000 Estonians currently live abroad. According to Statistics Estonia, the number of immigrants from Estonia, incl. Estonian citizens and/or immigrants who were born in Estonia, increased suddenly in 2015. Based on the survey carried out within the scope of the impact assessment of the Compatriots Programme, the decision to return to Estonia is influenced mostly by the existence of family and relatives in Estonia, Estonia being the preferred place of residence and the desire to have children attend school in Estonia, as well as the desire to make life better in Estonia and develop the state of Estonia. In addition to finding a new place of residence and job, it is very important to families with children that they find a place in pre-school and school, and that their children quickly adapt to the Estonian education system. In 2017 the MER commissioned a survey to map the education-related problems of people returning to Estonia¹⁷ and will develop a concept for supporting the children of returning families who start attending school in Estonia.

- 3) The share of non-Estonians who speak Estonian has increased in the last 10 years overall, but has remained at more or less the same level in recent years. According to the Estonian Labour Force Survey, the number of non-Estonians who do not speak Estonian exceeds 100,000 in the country. **It is mainly the Estonian language skills of people aged over 30 that have improved.**

Estonian language proficiency is important in finding a first job, but also in terms of later employment and wages. The employment and wage indicators of non-Estonians with good or excellent Estonian language skills and Estonians are equal. Young people with better language skills are socially more active and more likely to continue their education in general and higher education.

- 4) 49% of young people achieved the B2 level in the **state examination in foreign language** in 2015, which is the same result as in 2014, but 4 points lower than in the previous year. When we compare the results in different foreign languages, the share of those who at least achieved the B2 level in English has decreased a little: from 49% in 2014 to 43% in 2016. At the same time, the share of those who submit a level C language certificate instead of taking the state examination in English has increased (2.4% in 2014, 4% in 2015 and 6.4% in 2016). Learning the first foreign language is compulsory in Estonian schools from the third year. In the last five years, the share of children who start learning at least one foreign language in the first year (2011: 6%; 2016: 10%) or second year (2011: 25%; 2016: 35%) has increased.

Compared to other EU Member States more foreign languages are studied in Estonia. According to Eurostat, the average number of foreign languages studied at the basic school level (ISCED2) in 2014 was 1.6 in the EU and 2.0 per student in Estonia. In 2014, each Estonian upper secondary school student studied an average of 2.3 foreign languages; ahead of us were only Malta (2.5), Luxembourg (3.0) and Finland (3.0). English is popular in Estonian schools (as elsewhere in Europe) – the number of students who learn it is more than twice that of those who study Russian, which is in second place (2016/2017 academic year). 96.5% of basic school students and 97.4% of secondary school students learnt English in Estonia in 2015. The number of learners of other foreign languages has increased by a third in the last 10 years, which is very positive. The share of German learners has decreased the most: 16.5% of all foreign language learners studied German in the 2005/2006 academic year, but their share had decreased to 8.6% in the 2015/2016 academic year.

¹⁷ Read the survey here: <http://dspace.ut.ee/handle/10062/56616>

Governance (archiving)

- 1) The **accessibility of archival documents online has constantly increased** in the field of archiving (15.7 million digitized images of records , with the goal for 2020 being 16.9 million). The number of institutions who gave their digitalized records to National Archives for preserving, has been stable in the last two years (5)¹⁸ and the share of institutions whose main activity documents have been assessed has increased (83.5%). The problem of the archival documents preserved in proper depositories in the National Archives was eased with the completion of a new main building of National Archives in 2017 (the share of documents archived in depositories meeting the demands for good preservation conditions in 2016 was 79%; goal for 2020: 75%).
- 2) The most important activity of the National Archives in 2016 was the **relocation of archival documents to the new main building of the National Archives, known as Noora**. The move to Noora and the relocation of archival documents went more smoothly than expected. Agreeing on the development goals for the next four-year period and several important archival policy documents must be mentioned among the most remarkable achievements of 2016. The collection policy of the National Archives has been given a clearer and more specific framework in terms of the assessment and acceptance of archival documents.

¹⁸ Number of institutions that have given digital archival documents to the National Archives.

The five strengths of Estonian education, summaries

Understanding what we have done well and how to maintain or improve our activities is just as important as understanding problems and finding solutions to them. Due to our excellent PISA results, we have often had to answer questions from foreign journalists and other interested people over the last year who have wanted to uncover the secret behind the strength of Estonian education. Based on the previous annual analysis of the MER and performance area reports, we selected five topics with which Estonian education stands out internationally and/or where our development has been exceptionally positive, and analysed them in greater detail.

The five strong aspects of Estonian education and youth work which will be discussed in greater detail in this analysis are:

- good skills;
- salary increase of teachers;
- participation in youth work;
- STEM education in Estonian higher education; and
- foreign students in Estonian higher education.

In addition to the five strengths, the success on the labour market in 2015 of people who graduated with vocational and higher education from 2005-2014 also is included in this summary.

We will take a brief look at all of these topics below. The full texts of the analyses in Estonian are accessible on the website of the MER in the survey and statistics section.

Good skills

The main cognitive skills (literacy and numeracy) are (very) good in Estonia among young people who have completed basic, general upper secondary or academic higher education (up to 30 years of age) (Figure 1). The cognitive skills of young people with vocational and professional higher education are equal to the OECD average. The skills of older age groups and especially people with higher education are below the OECD average, and the problem-solving skills of Estonian people in a technology-rich environment are especially poor.

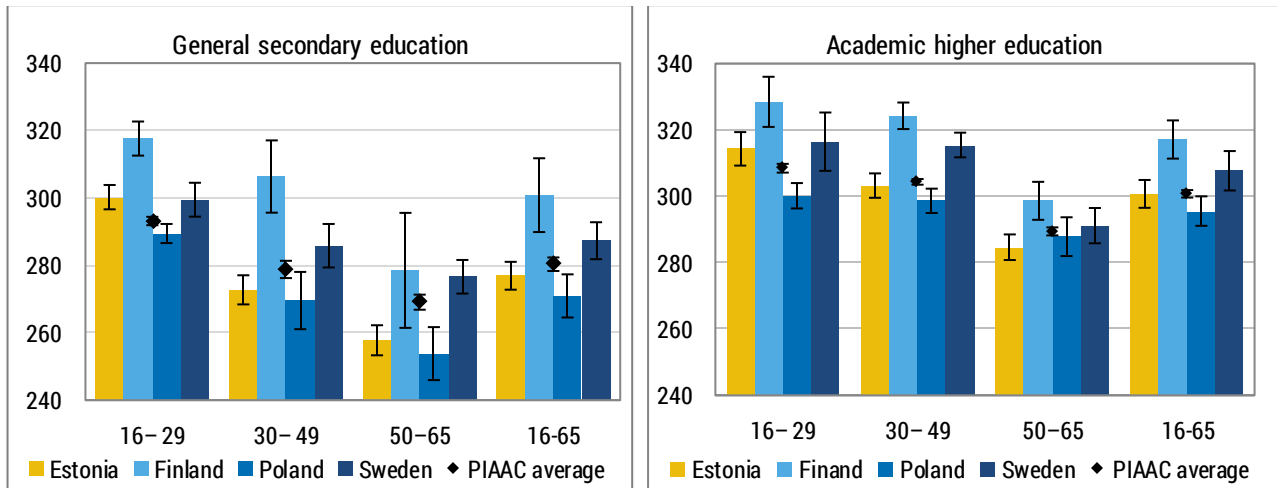


Figure 1. Average results in literacy in different age groups among people with general secondary and academic higher education in Estonia and neighbouring countries and the 24 countries of the PIAAC survey on average
Note: academic higher education includes Bachelor's, Master's and Doctoral studies and specialist diploma studies from the Soviet era.

Source: PIAAC survey (Valk & Silm, 2015)

Skills are important in ensuring success on the labour market and participating in society. The importance of non-cognitive skills¹⁹ is even more universal than that of cognitive skills, as the bigger benefits of the latter become evident on the labour market to those whose education is higher and whose work is more complicated. Those whose level of education remains low may not benefit greatly from a slightly better knowledge of mathematics, but need better self-direction or communication skills instead. The early years, incl. pre-school and primary education, are the most important in the development of skills. Later interventions during the teenage years primarily have an impact on non-cognitive skills and, through them, on future education and success on the labour market. The development of cognitive and non-cognitive skills is influenced by the family and the school in addition to inherent capabilities and personal characteristics. The school also plays an important role in the development of non-cognitive skills, and better non-cognitive skills do not develop on the account of academic knowledge and skills, but support their development instead.

Many things have been done right in Estonia to ensure that the skills of our young people and adults are not only very good, but also equally distributed. In brief, our good skills can be explained by the following factors:

- Education is highly valued in Estonia. Children's performance is better if parents take an interest in their studies. Over 90% of parents do so. Estonian school principals involve parents in school life more than in most other countries and this is also associated with better performance.

¹⁹ Non-cognitive skills can largely be associated with personal characteristics, but they also include social and emotional skills, persistence or consistency, enterprise, self-efficiency, self-control and self-management skills.

- The Estonian education system supports equality. The majority of children participate in pre-school education, which is largely financed from public funds. Although a few schools use admission exams to select first-year students, a broader tracking between general and vocational education still occurs later here (at the age of 16).
- Estonian teachers are highly qualified and schools are not systematically different in terms of how many qualified teachers they have.
- Schools offer additional opportunities for hobby activities. Olympiads and subject competitions support interest and skills.
- Estonian schools have great responsibility and decision-making rights in respect of their activities. The performance of schools is monitored and results are published.
- Basic education is not the only type that is strong in Estonia. Upper secondary and higher education in Estonia today are competitive among OECD countries. However, there are problems after upper secondary education, as the development of stronger students is not as marked as the development of weaker students.
- The need for and interest in lifelong learning are great and participation is increasing. Estonian adults consider participation in training significantly more necessary than the OECD average. People are also rather eager to participate in training. The participation of Estonian adults in lifelong learning has tripled in the last 20 years and doubled in the last decade.

Salary increase of teachers

The average salaries of general education school teachers have increased significantly in the last 10 years and particularly in the last four years: the average gross monthly wages and the minimum wages of teachers in 2016 were 49% higher than the same indicators in 2012. The average gross monthly salary of the general education schools owned by the state and local governments in 2016 was 1210 euros, which was 64 euros higher than the Estonian average gross monthly salary (Figure 2). The pay rise of Estonian teachers also stands out at the international level. The wages of teachers have increased in most OECD countries in the last 10 years, but the indicators of Estonia are more impressive when compared to others.

The national goal of teachers' salary increase set at the level of government in Estonia, which is already being strongly implemented, has resulted a significant increase of teachers salaries. Above all, this should send a clear message to teachers and society in general: teachers are important and valued. In order to ensure that the teacher's salaries continue to increase, it is necessary to maintain the existing national levers – the minimum wage of teachers and the targeted use of the wage subsidy. It is also important to guarantee that all of the wage subsidy allocated by the state reaches teachers – in 2016 there were 59 municipal school managers who did not pay all of the wage subsidy included in national education grant to teachers as wages in the same budgetary year. School owners also have an important role in guaranteeing the pay rise of teachers, as their ability to streamline the school network and modernise the basis of the organisation of work and wages of teachers should increase following the administrative reforms.

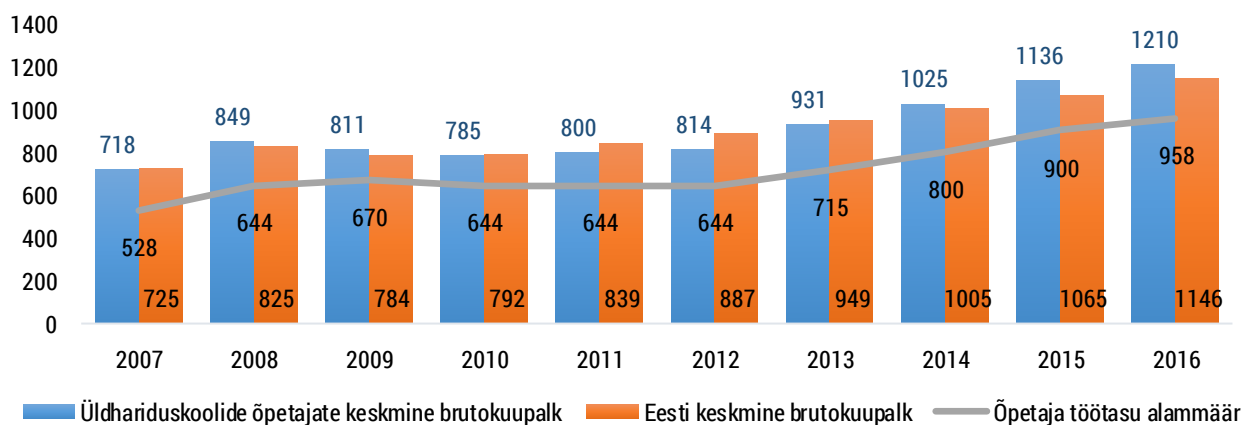


Figure 2. Teachers average gross monthly salary²⁰ in comparison with average national salary in Estonia, 2007-2016

Source: Calculations by the MER and Statistics Estonia

Guaranteeing teachers a good salary and thereby improving the reputation and attractiveness of teaching is important in making teachers feel that they and their work are valued. It emerges that teachers themselves accord teaching the lowest reputation. The good reputation and attractiveness of the profession are also important in ensuring a supply of new teachers. 11% of general education school teachers have reached retirement age in the 2016/2017 academic year and a significant number of teachers will be doing so in the coming years. However, the number of students admitted to and graduating from teacher training has decreased in the last 10 years, and in terms of percentages the decrease has been greater than the average in higher education. Less than half of graduates start working in schools after completing teacher training. The wage level is certainly not the only factor that shapes the reputation and attractiveness of teaching, and it should not be the main factor in choosing a career. However, the wage level should not become an obstacle to choosing a specialty either.

²⁰ In state and municipal general education schools

The performance of students is also influenced by many different factors, starting from the students' families and ending with the state's education policy goals. However, teachers play the main role in motivating, supporting and developing students in schools. The way teachers manage to motivate and develop students depends on the teacher's own motivation, training, knowledge, personal characteristics and much more. The reputation of teaching must be good and it must be an attractive career choice to many in order to have the chance to choose the best and most suitable candidates for teacher training and then teaching positions.

The surveys carried out by educationalists and economists mainly describe the impact of the wages of teachers on the performance of students from two angles: a better wage level guarantees more competition for teacher training and teaching positions, which improves the quality of teachers; and the quality of teaching is higher in countries where teachers' wages are higher than in similar jobs or jobs requiring similar knowledge. However, it is important to note that the impact of many other factors on the performance of students has also been raised in various surveys and the goal of the analysis is not to highlight the wage level of teachers more than other impact factors. The goal is to acknowledge that a factor like this, which may seem unexpected at first, also has an impact.

Participation in youth work

Youth work is an important opportunity for discovering interests and talents in addition to formal education, and developing them in a suitable format. An important priority in the area of youth affairs in Estonia is that as many young people as possible make use of this opportunity. In 2016, 50% of young Estonians aged 7-26 participated in the youth work activities included in the indicator that assesses participation in youth work measured since 2008 – 32% in hobby education²¹, 11% in camps, 5.2% in national youth associations, 1.4% in summer work camps and 0.8% in participation councils (Figure 3).

Many young people also take part in activities that were either created during the period of the new development plan or participation in which started at the time – an estimated 25% in the various activities of open youth centres and ca 26% in the hobby clubs of general education schools (both of which are long-term activities, but the collection of detailed statistics about them only started recently). If every young person in Estonia participated in just one youth work activity, there would be more young people participating in youth work in Estonia than are living in Estonia. However, various surveys show that 5-20% of young people do not participate in any youth work activities and that many young people (more among those who are younger, fewer among those who are older) participate in several activities. A large share of young people who participate in youth work (85% according to the satisfaction survey of 2015) are satisfied with youth work.

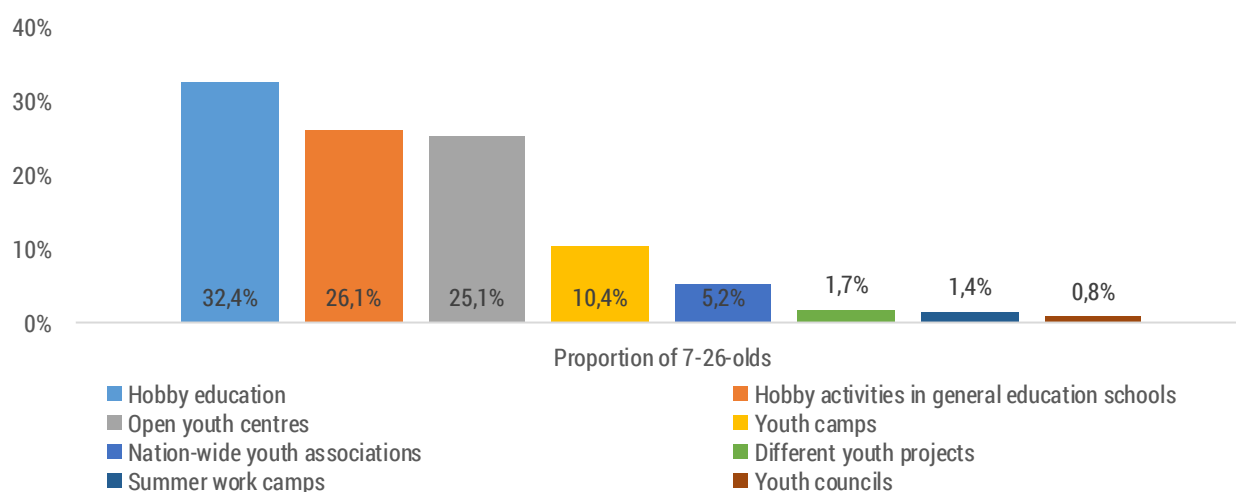


Figure 3. Participation of Estonian young people in various youth work activities, 2016

Source: Calculations by the MER. Data: MER (Estonian Education Information System), Statistics Estonia, Estonian Youth Work Centre

Although many young people participate in at least one youth work activity, there are still some who cannot participate in youth work for various reasons. The local government field of activity, which is used to advise local governments and to encourage them to cooperate in the organisation of youth work and the creation of new opportunities is one of the biggest measures recently used to improve the accessibility of youth work opportunities. A hobby activity support scheme will be implemented from autumn 2017 which on a broader scale has the same purpose, but is aimed at solving problems in hobby education and activities (especially problems related to the diversity and accessibility of hobby education and activities) in local governments.

²¹ Hobby education is provided in hobby schools on the basis of curricula.

Considering the increasing activity of young people in the digital world, smart youth work is an important topic (and an important youth work priority during the Estonian Presidency of the European Union) – the concept of smart youth work was prepared in late 2016 and the action plan prepared for its implementation includes activities aimed at young people, activities related to the development needs of youth workers and activities related to the quality of youth work and using digital tools to improve the knowledge of young people. In addition to the local government field of activity, various new activities have been implemented with the support of the ESF (vocational laboratories, community practice, the youth initiatives programme “Nopi Üles” that [provides young people with an opportunity to design and carry out a project in their local communities](#), Youth Prop-Up Programme aimed at bringing NEETs back to education or employment and supporting local governments that have not organised summer work camps for young people in the last three years from the working summer programme).

The general situation in participation in youth work is good and the needs and interests of young people are taken into account when activities are planned, but keeping the situation (the number of participants in youth work and their satisfaction with youth work) at the same level needs constant work, and effort has to be made so that young people who have not been able to participate in youth work activities for various reasons can do so if they wish to.

STEM²² education in Estonian higher education

Increasing the proportion of science, technology, engineering, math and ICT (i.e. STEM) in higher education has been a priority for long time, as these are the areas that have been found to have a clear impact to economic development. The labour market demand in Estonia is also largely related to STEM specialties. As a whole, development in the last 10 years has been positive: the numbers of entrants, university students and graduates alike show positive trends (diminishing decrease or even increase as a contrast to other fields of HE in Estonia) The share of graduates in all three STEM fields has increased to 27% of all graduates, which exceeds the goal initially set in lifelong learning strategy (Figure 4).

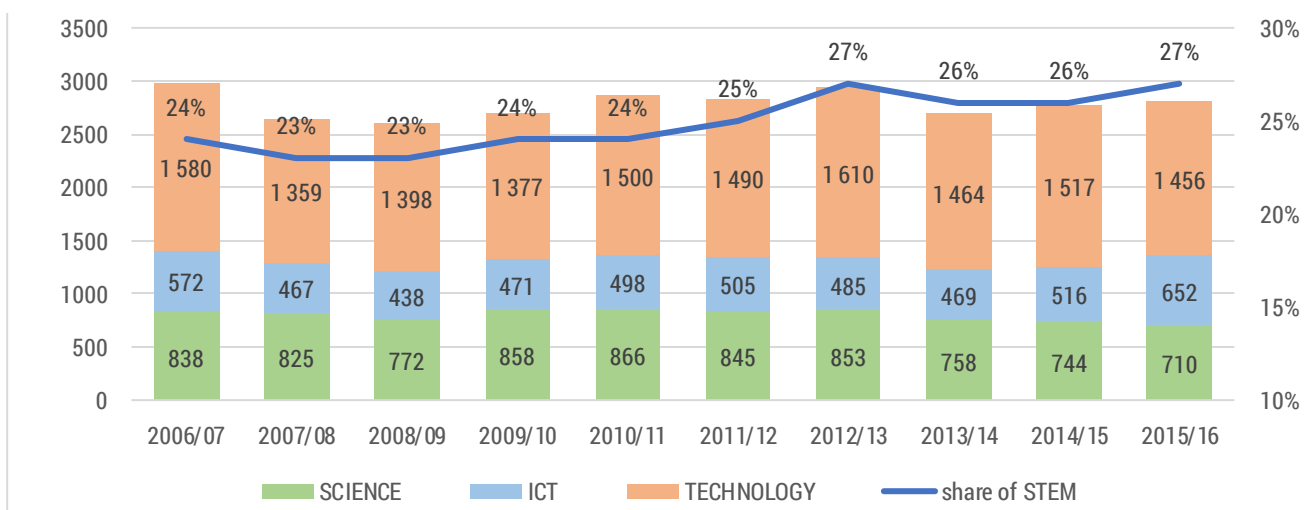


Figure 4. Numbers of graduates with higher education in STEM fields* and share of STEM graduates among all graduates

*Fields in figure are responding to ISCED-F 2013 broad fields of education (resp. SCIENCE – 05 natural sciences, mathematics and statistics, ICT – 06 Information and Communication Technologies and TECHNOLOGY – 07 engineering, manufacturing and construction).

Source: Estonian Education Information System

However, the picture behind the generally positive situation is diverse: the developments in the three STEM areas have been different. Labour market supply and demand and also the interest of students, are nurturing the ICT field – the deficiency of both high-qualified ICT specialists and employees with good ICT skills in any field is growing fast. Paradoxically in spite of growing number of ICT students and graduates, the employers are still complaining about the shortage of qualified workers. The same tendency seems to appear in technical sciences, especially considering the future trends and growing demand in labour market. On the other hand in the field of natural sciences, the supply seems to outstrip demand

A breakthrough has occurred in ICT in the last decade, where the numbers and proportions of entrants, learners and graduates demonstrate a growth even against the backdrop of the decrease in the total number of students. ICT is clearly in demand on the labour market, which is evident in high employment and salaries, but also in the relatively high drop-out rate, low learning mobility and, in comparison with other STEM areas, the rather small proportion of people who continue their studies after graduation. However, it is positive that every third ICT graduate continues in Master's studies a few years after graduating, usually also in ICT (even if they do not obtain

²² STEM denotes three fields of study: (1) natural sciences, mathematics and statistics (SCI); (2) information and communication technologies (ICT) and (3) engineering, manufacturing and construction (Technology, TECH).

the degree). Various support measures (grants, scholarships, special programmes, etc.) are stimulating the rapid development of ICT specialties, as there are more of them in ICT than in any other area.

It is difficult to characterise the area of natural sciences, mathematics and statistics unequivocally. The small minority (less than 10%) in this field are mathematics and statistics students – in a way more academic part of ICT: they are continuing their studies twice as often as ICT graduates, mainly in Doctoral programmes; and they earn high salaries after graduation, but still not as high as ICT graduates. At the same time, the number of those who only work is two times smaller among them. Very few of them have gone abroad or are unemployed. The natural sciences programmes, however, remain an area of many questions. . 2500 people with good skills (as proved by relatively high competition in admission, good state examination results after secondary education and skills of graduates are studying in this field, a large share of whom (twice as many as the average) are continuing their studies after the acquisition of higher education, including record numbers in Doctoral studies (more than in any other field). However, there is no clear labour market demand that is evident in salaries in these fields: the earnings of graduates are smaller than the higher education average.

While the field of science is characterised by more supply and less demand, the situation in the area of technology is the opposite. Employment and salaries in two subfields in the area of technology (technological specialties, and architecture and construction) are high and studying further after graduating is not very common. However, the situation in other specialties included in the field is very diverse. Admissions in the field of technology as a whole have decreased – by a third in the last five years, competition being below the Estonian average and the general information-processing skills of graduates being low. There are also an exceptional number of drop-outs in the field of technology, especially during the first year of studies. Thus, considering current demand, it is necessary to find a way of getting more university students who prefer natural sciences to select technical fields instead.

Foreign students in Estonian higher education

Internationalisation is a process in modern higher education and research which brings all sorts of benefits to many participants. The participation of foreign students in Estonian education system helps to improve the quality of higher education and to strengthen international position not to mention the enrichment of learning environment. Engaging foreign students is also an opportunity to compensate the decrease in the number of Estonian students as well as the shortage of qualified workers on the Estonian labour market

In the strategy for the internationalisation of Estonian higher education approved in 2007, it was conceded that the historical experience, geographical location and linguistic peculiarities would not help Estonia become a place of studies attractive to large numbers of foreign students. However, current developments show that the number and share of foreign students in Estonian higher education can be significantly increased. Almost four thousand foreign students were studying in Estonia by the start of the 2016/2017 academic year – over four times more than 10 years ago and almost 2000 more than was set as the target in the above-mentioned strategy (Figure 5). In the 2016/2017 academic year, foreign students comprised 8.2% of the student body, which indicates rapid movement towards the target set in the higher education programme (10% by 2020). In Master's and Doctoral studies, the share of foreign students has already exceeded the target: the share of foreign students was 13.5% in Master's studies and 14.2% in Doctoral studies in the 2016/2017 academic year.

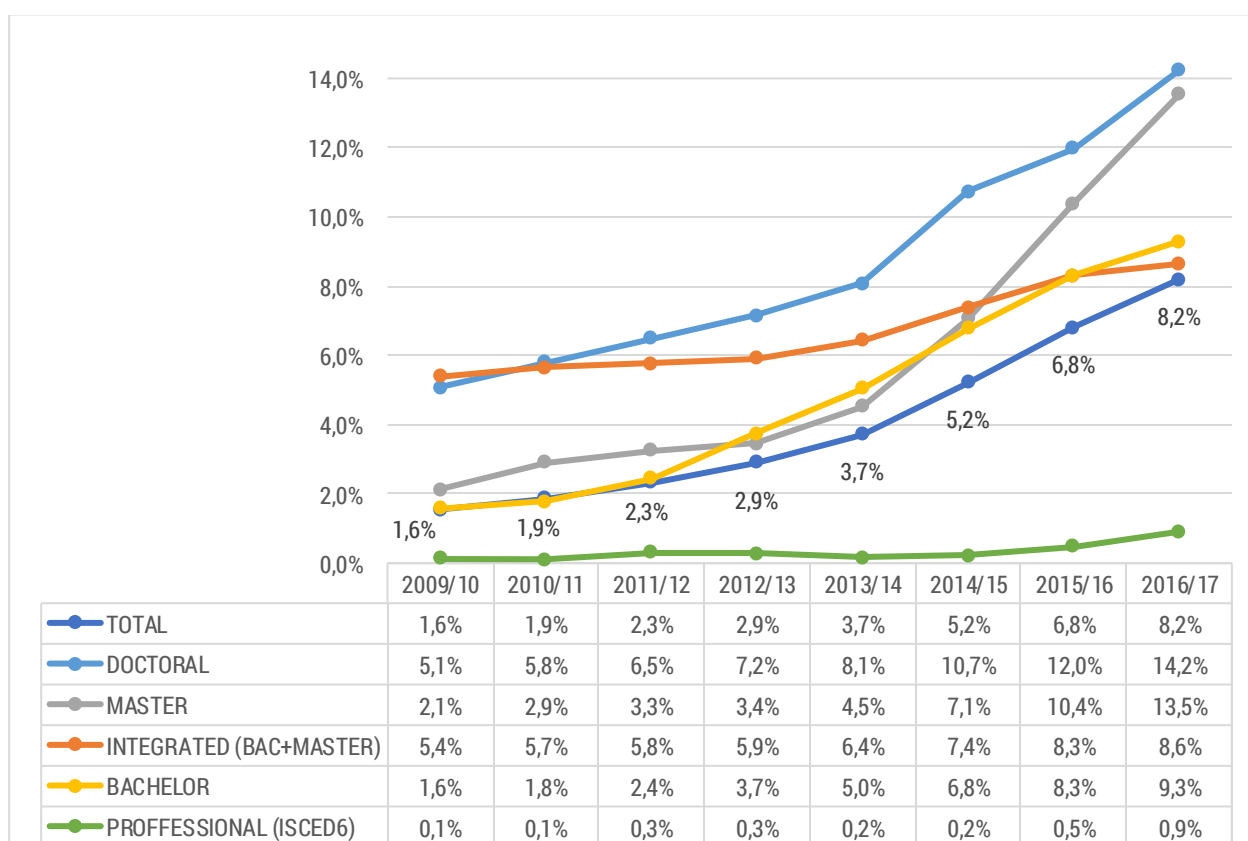


Figure 5. Share of foreign students among total HEI students in Estonia by level of study

Source: Estonian Education Information System

The proportion of foreign students completing their studies among all graduates has also increased rapidly and reached the same level as the indicator for the student body as a whole in the 2015/2016 academic year: foreign graduates comprised 6.9% of all graduates, while the share of foreign students among all students was 6.8%. The

drop-out indicators are considerably lower than the average : 9.9% of foreign students dropped out from November 2015 to November 2016 (dropout rate of total student body: 16.1%). However, even the one-tenth of foreign students who dropped out during the year is an issue for concern.

International joint curricula and curricula in foreign languages create good conditions for foreign students. Among the latter, the number of curricula in English has increased very rapidly so that more than 14% of all curricula were in English by spring in the 2016/2017 academic year, and the share of curricula in English exceeded one-quarter at the Master's level. Foreign students are also studying according to multilingual curricula (English and Estonian curricula on Doctoral level) and approximately 5% according to Estonian curricula in the 2016/2017 academic year.

The share of male students among foreign students is higher than in the general student body (43% females among foreign students in 2016/2017). The division of foreign students by age reflects their division by level of study – since there are relatively more students at second and third level (Master's and PhD) of tertiary education among foreign students than on average, the share of students representing the age group characteristic of these levels (25-29) is also relatively higher (30% of foreign students and 22% of all students belonged to this age group in the 2016/2017 academic year). There are fewer adult learners (defined as aged 30 and over) among foreign students than among university students in total (7% of foreign students in recent years; twice as many on average among the student body).

Traditionally, the biggest share of foreign students in Estonia come from Finland. However, while Finnish students comprised almost half of all foreign students in Estonia five years ago, their share in 2016/2017 was 35%. The number of foreign students of other origin and the geographic range of home countries have grown. Foreign students from Russia retain second place (7% in 2016/2017), but Ukraine and Nigeria have risen strongly as countries of origin of foreign students in recent years. These countries also correspond to the priorities of Estonian higher education internationalisation policy. However, there could be more students from Asia, e.g. China and India, from where more and more students are entering on international higher education system around the world.

Most often, foreign students come to Estonia to study business, administration and law (39.3% of foreign students in 2016/2017). In comparison with the overall number of university students, the share of foreign students exceeds 10% in three fields: agriculture, business and social sciences. The share of foreign students in ICT also reached 9.1% in 2016/2017. The share of foreign ICT students is particularly high among Doctoral students – almost a third. The share of foreign students has always been small (less than 3% of all students in the field) in education, service and health, but still the share of foreign students in all of these fields has increased in the last three-four years.

Some foreign students stay to work in Estonia after graduating (e.g. ca one-fifth of foreign students who graduated in 2014 were employed in Estonia according to national registers in 2016) or continue their studies (7% of the students who graduated in 2015/2016 continued studying in Estonian HEIs).

The state and institutions of higher education alike have made efforts to attract foreign students to Estonia.. A strategy for the internationalisation of higher education has been developed and an agency for this has been established. Work on the development of curricula is important – joint curricula with foreign universities and many English curricula have been created. The establishment of massive open online courses (MOOC) is an increasing trend in the internationalisation of studies.

Marketing campaigns are constantly carried out to attract foreign students to Estonia. The target countries have been selected and the information portal 'Study in Estonia' has been launched. Several grant programmes are aimed at foreign students who have already come to Estonia (the national grant programme for foreign students, researchers and teachers, Dora Pluss). Universities provide support services and information (e.g. Student Ambassadors at the University of Tartu), yet support services and the distribution of information are the aspects with which foreign students are not fully satisfied. An important area that should be developed further is the provision of traineeships in accordance with the studies..

All in all, it is possible to repeat the conclusion given in the interim assessment report of the strategy for internationalisation of higher education of 2011, which is that despite the complicated preconditions, “remarkable steps have been taken in Estonia to make Estonian higher education more international” (Tamtik et al., 2011: 54).

Success on the labour market in 2015 of people who graduated with vocational and higher education from 2005-2014

Professional education and skills are becoming increasingly important alongside the development of technology and society. In conditions of a changing labour market, where habitual jobs are disappearing and new ones are emerging in their place, those who are prepared to constantly learn end up being more competitive. Previous education and its quality play an important role in the development of readiness for lifelong learning. This is where future skills and learning habits develop. In other words, a person's education, experience and skills have a cumulative impact on further education and career development – for example, people with lower levels of education participate less in lifelong learning and thereby limit their career prospects.

Although we could not measure this directly with this analysis, the results suggest that learning is beneficial in every sense, in terms of both general employment and income. It is also clear that education is one of the most important factors that shapes the economic well-being of a person: the higher the level of education, the better the prospects on the labour market. The results of this analysis indicate that the wages of people with vocational education are significantly lower than those of people with higher education (the latter exceeding the wages of people with vocational education by half on average; see Figure 6). On the one hand, the reason may be that people with higher education have more complicated jobs and are paid higher wages for it, or they work in more profitable and innovative areas of activity.

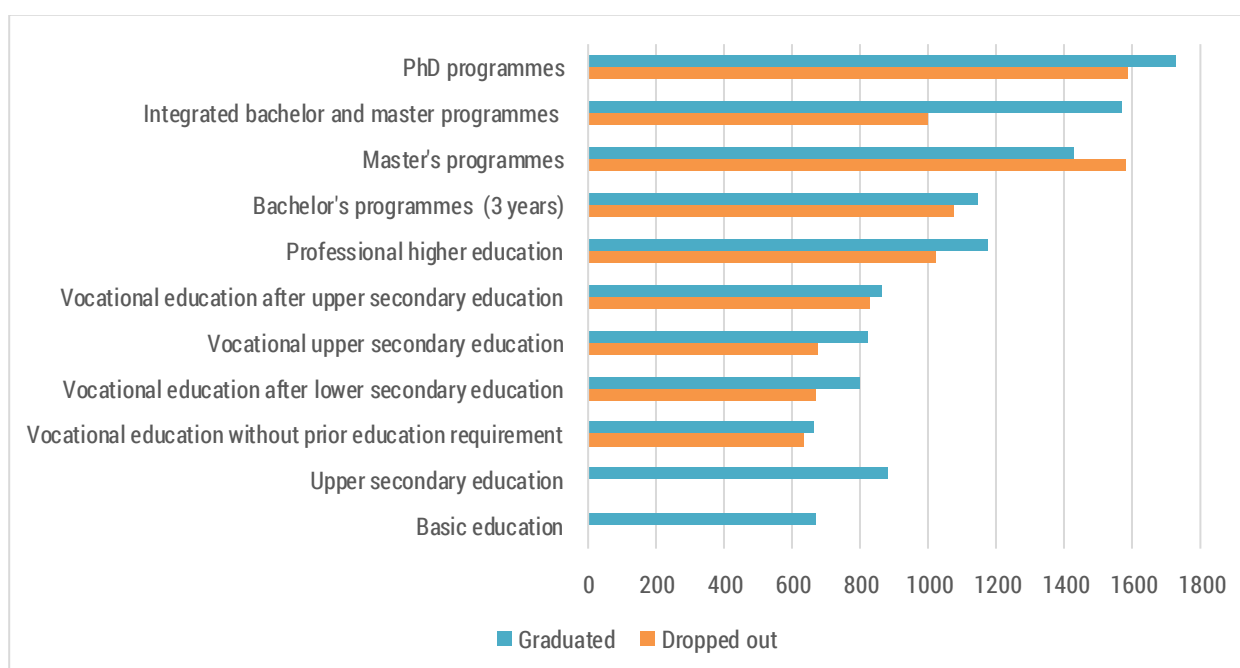


Figure 6. Salaries of people in 2015 who dropped out of and graduated from vocational schools and higher education institutions from 2005-2014

However, it must be kept in mind that only the official wages of people are taken into account in the analysis 'Success on the Labour Market' and the data about them is obtained from the Tax and Customs Board. Thus, unofficial earnings (envelope wages) are not recognised in this analysis. The data of the Estonian Institute of Economic Research indicate that it is people with lower education who often earn envelope wages. Many people in the service industry (beauticians, hairdressers, car mechanics, etc.) may also be among those who are paid such wages. The income earned as a sole proprietor and dividends are not taken into account either when the average monthly income is calculated. This sets some restrictions on the interpretation of the results, but income gaps that depend on the level of education, field of study and gender also exist on the basis of the current methodology.

People may be doing equivalent jobs, have exactly the same length of service and a similar (professional) background, but their income may be many times different.

The main conclusions that can be drawn on the basis of the analysis are as follows:

- Most people with professional education are employed. The higher the education, the higher the employment rate.
- The employment of vocational school and higher education institution graduates is influenced by the field of study in addition to gender, age and graduation following the standard period of study. Graduates of ICT, technical fields, physical natural sciences, education and mathematics and statistics are more likely to be employed among graduates with higher education. Those who graduate from the specialties of construction and architecture and humanities in vocational education have a slightly smaller chance of finding work than others.
- There is a linear connection between the level of education and wages: every subsequent level of education increases the average income. Every year spent on the labour market does the same.
- The wages of people with vocational and higher education increased by a third on average from 2011-2015. The wage increase in vocational education was greatest among graduates in the fields of study of health, security services and manufacturing and processing, and in higher education in the fields of study of agriculture, veterinary medicine and mathematics and statistics.
- The person's gender, age and speciality (field of study) all have an impact on the average wage. The gaps in income can amount to 600 euros, depending on the field of study in vocational and higher education alike.
- Those who graduated from the field of study of ICT in a vocational school or institution of higher education earn the highest average income, while the income of those who studied humanities is the smallest.
- Gender gaps in income have increased and do not depend much on the level of education: the difference between the income of men and women is 42% in vocational education and 32% in higher education.
- Graduation is more beneficial than dropping out. Master's studies are the exception, as drop-outs earn somewhat more than graduates. There could be several reasons for this – for example, people who start studying for a Master's degree already work and only want to acquire specific knowledge or skills without being interested in acquiring the degree. It may also be that the people who drop out already have a large workload and/or work in their specialty before their studies, so their salary is already higher before they drop out.

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