



ANALYSIS: LABOUR MARKET SUCCESS OF VOCATIONAL AND HIGHER EDUCATION GRADUATES

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I KEY CONCLUSIONS

On its educational statistics website www.haridussilm.ee, the Ministry of Education and Research has published **data on the labour market conditions and income from work of 2005-2013 graduates of VET and higher education** as of 2011-2014 by educational institution and field of study.

- Educational attainment is valuable as each subsequent level contributes to an increase in income.
- Work experience provides additional income on the Estonian labour market. The analysis demonstrates a significant difference in the income of school-leavers now and nine years ago.
- While immediately after finishing school, education with a narrow focus (upper secondary VET and professional higher education) proves to be more profitable than that with a general focus (general upper secondary education and academic BA studies), the differences recede or even reverse over time.
- The data confirm the rapid increase of income in the past few years, particularly among recent school-leavers. The income of those who graduated in 2010 increased by 30% on average in the 2011-2014 period, while the same figure for 2005 graduates was slightly less than 20%.
- Engineering and computer sciences provide higher income at all education levels, suggesting that the current educational policy aiming to raise the number of STEM graduates and encourage young people to enter these fields of study has been appropriate. It is important to continue to prioritise growth areas and fields of study as well as to promote STEM fields.
- Over 10% of VET or higher education graduates are inactive on the Estonian labour market, do not work, are not unemployed and are not in military service or raising young children, with 1/3 of them being abroad according to data from the Population Register. The majority of them are VET graduates.



- Young people who have not reached at least upper secondary education prior to entering the labour market are primarily at risk.
- Gender gaps in education and income are of particular concern. The latter is especially obvious among vocational education graduates.

II ANALYSIS

EVERY SUBSEQUENT EDUCATION LEVEL INCREASES INCOME. HIGHER EDUCATION PROVIDES A 50% HIGHER INCOME THAN VOCATIONAL EDUCATION.

Similarly to other studies, this analysis reveals that the higher the education level, the higher the income from work (see Table 1). According to current data, the income of those who attained higher education in the 2005-2013 period (1,176 euros) was approximately 50% higher in 2014 than the income of vocational graduates (772 euros).

Table 1. Average income of 2005-2013 graduates of vocational or higher education in 2014 by education level.

Education level	Year of graduation									
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2005-2013
PhD programmes	1,672	1,653	1,717	1,646	1,707	1,573	1,621	1,578	1,523	1,623
Integrated bachelor and master programmes	1,590	1,521	1,357	1,446	1,511	1,480	1,399	1,429	1,339	1,437
MA (or equivalent) programmes	1,485	1,462	1,361	1,444	1,357	1,354	1,324	1,300	1,215	1,350
BA programmes (4 years)	1,311	1,343	1,322	1,081	1,427	1,378	1,387			1,318
BA programmes (3 years)	1,275	1,203	1,224	1,185	1,105	1,104	1,016	947	849	1,061
Professional higher education	1,157	1,164	1,177	1,116	1,095	1,092	1,027	1,024	993	1,094
Higher education	1,274	1,262	1,258	1,240	1,188	1,189	1,121	1,090	1,025	1,176
Vocational education after upper secondary education	851	818	834	817	819	803	781	765	741	798
Vocational upper secondary education	827	824	831	802	763	757	718	673	642	757
Vocational education after lower-secondary education		712	787	794	763	684	678	641	789	734
Vocational education without prior education requirement		505	637	715	656	625	546	561	483	583
Vocational education	839	819	830	807	784	771	742	712	700	772
TOTAL	1,109	1,098	1,103	1,077	1,034	1,033	978	943	894	1,023

Source: Ministry of Education and Research, HaridusSilm.ee



The variation between several higher education levels is also significant. Compared to the first level of higher education (Bachelor's degree and professional higher education, *ca* 1,075 euros), a Master's degree provides *ca* 25% higher income while those who hold an integrated Bachelor's and Master's degree or a doctoral degree earn 35% and 50% more, respectively. It is interesting to note that immediately after graduation the income of professional higher education graduates is slightly higher than that of BA programmes. However, 3-4 years after graduation this difference disappears, and nine years after graduation the BA programme graduates earn more than the professional higher education graduates.

The data reflects the low income from work of VET graduates. The income of those who have attained vocational upper secondary education is 642 euros immediately after leaving school, while those who finished school nine years earlier earn 827 euros. Whereas immediately after finishing school the income of those who attained vocational education after upper secondary education differs from vocational upper secondary education graduates (741 euros), no substantial difference can be seen among those who graduated earlier. The income from work of school-leavers who attained vocational education after upper secondary education in 2005 amounted to 851 euros in 2014. As such, there is no substantial difference in terms of when vocational education is attained or whether it is attained together with secondary education or thereafter. Meanwhile, the income from work of professional higher education graduates is over 300 euros higher immediately after graduation than compared to those who attained vocational education after finishing upper secondary school (see Table 1).

Compared to general upper secondary education, vocational upper secondary education provides an income advantage upon entering the labour market, but incomes later equalise due to work experience. At the same time, the decrease in studies being suspended at the (vocational) upper secondary education level is important as it provides a significant income advantage compared to basic education (lower secondary) (see Figure 1). Previous studies have revealed that the main difference between upper secondary and lower secondary education graduates can be attributed to whether the individual is successful in finding a job. According to previous studies conducted in Estonia, upper secondary school leavers are more likely to secure employment than lower secondary school leavers (see e.g. Anspal et al. 2011¹). The same trend was emphasised by a PIAAC survey² demonstrating the difference between the unemployment rate of upper secondary school leavers (*ca* 8-11%) and those who attained

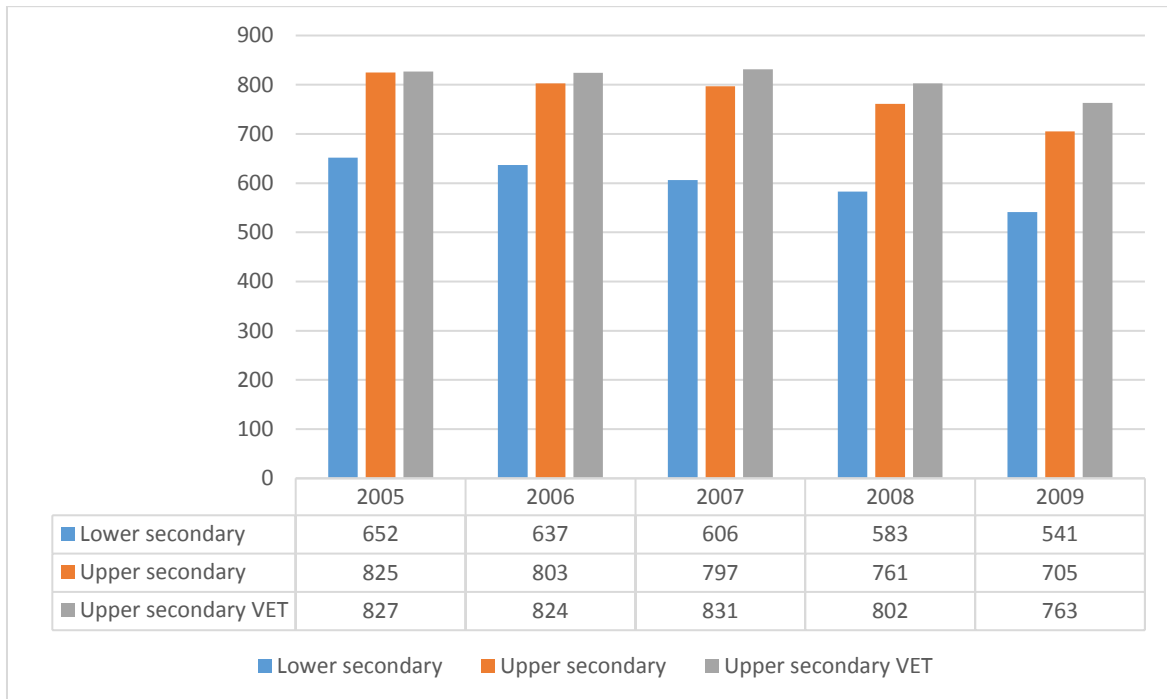
¹ Anspal, S., Järve, J., Kallaste, E., Kraut, L., Räis, M. L., Seppo, I. (2011). *The Cost of School Failure in Estonia*. Estonian Center for Applied Research CentAR. Research report for the Estonian Ministry of Education and Research.

² Anspal, S., Järve, J., Jürgenson, A., Masso, M., Seppo, I. (2014). *Oskuste kasulikkus tööturul: PIAAC uuringu temaatiline aruanne nr 1*. Tartu: Ministry of Education and Research



vocational education after upper secondary education (4-9%). No difference can be discerned between the incomes of these two groups.

Figure 1. Average income of 2005-2009 graduates of general lower secondary (basic), general upper secondary and vocational upper secondary education in 2014.



Source: Ministry of Education and Research, HaridusSilm.ee



INCOME INCREASED BY 20-30% IN 2011-2014

Recent months have seen intense media coverage of the overly rapid rise in incomes. Current data confirm this: the income of 2005-2010 graduates of VET and higher education has increased by approximately 20-30%. This increase in income is more rapid among later graduates, which is logical considering that they start at a lower income level. See Table 2. On the other hand, looking at the income of vocational education graduates, this increase is necessary. It is likely that we cannot and should not presume that cheap subcontracting with low labour costs will last for long. Meanwhile, it is difficult to attract young people to vocational education. The nature of work must therefore become smarter and specialist training more comprehensive, which is not at all consistent with the immediate expectations of every employer.

One option would be to focus primarily on economic sectors that require high-skilled workers and that allow for paying higher remuneration (see fields of study analysis).

Table 2. Income of 2005-2013 graduates of vocational and higher education in 2011-2014 and income growth of 2005-2010 graduates in 2011-2014.

Year of graduation	Vocational education, year of observation					Higher education, year of observation				
	2011	2012	2013	2014	2011-2014	2011	2012	2013	2014	2011-2014
2005	683	733	785	839	18.60%	1057	1131	1197	1,274	17.00%
2006	656	710	770	819	20.00%	1,040	1,104	1,184	1,262	17.60%
2007	638	704	772	830	23.00%	1032	1102	1,184	1,258	17.90%
2008	611	680	745	807	24.30%	975	1058	1158	1,240	21.40%
2009	574	641	721	784	26.80%	894	998	1,095	1,188	24.70%
2010	538	615	690	771	30.30%	854	955	1088	1,189	28.10%
2011		590	671	742			881	1004	1,121	
2012			641	712				957	1,090	
2013				700					1,025	

Source: Ministry of Education and Research, HaridusSilm.ee

ENGINEERING AND COMPUTER SCIENCES GRADUATES EARN HIGHER INCOMES. INCOME IS MORE AFFECTED BY FIELD OF STUDY THAN EDUCATION LEVEL.

At the higher education level, the income from work of graduates varies from 800 to 1,700 euros, i.e. the income of arts graduates whose income is below average earn 53% less than computer science graduates who earn the highest income. At the VET level, incomes vary from



620 to 1,130 euros, i.e. those who graduated from personal services earned *ca* 45% less than those who graduated from security³ services. See Table 3.

Table 3. Average income of 2005-2013 graduates of vocational or higher education in 2014 by field of study and gender.2005-2013.

Field of study	Higher education			Vocational education		
	Total	Male	Female	Total	Male	Female
Computer sciences	1,713	1,777	1,500	881	982	653
Security services	1,530	1,600	1,268	1,130	1,174	989
Transport services	1,480	1,618	1,274	767	929	590
Engineering and engineering trades	1,451	1,495	1,205	897	913	616
Law	1,370	1,507	1,303			
Architecture and construction	1,307	1,442	1,055	773	792	543
Health	1,236	1,641	1,201	653	972	624
Mathematics and statistics	1,217	1,326	1,184			
Business and administration	1,204	1,405	1,133	702	885	676
Veterinary sciences	1,198	1,428	1,154	740		740
Social and behavioural sciences	1,193	1,391	1,124			
TOTAL	1,176	1,425	1,060	772	887	622
Journalism and information	1,123	1,341	1,082			
Physical sciences	1,090	1,206	983			
Agriculture, forestry and fishery	1,064	1,201	896	829	953	695
Manufacturing and processing	1,060	1,296	951	656	778	565
Life sciences	1,031	1,148	988			
Personal services	974	1,073	937	620	761	574
Environmental protection	974	1,135	906	707	863	647
Teacher training and education science	966	1,274	943			
Humanities	919	1,031	890			
Social services	901	1,153	886	638	1,040	612
Arts	807	922	767	677	811	598

Source: Ministry of Education and Research, HaridusSilm.ee

OVER 10% OF PROFESSIONALLY EDUCATED PEOPLE ARE INACTIVE ON THE ESTONIAN LABOUR MARKET

As of 2014, 3.7% (i.e. 5,400 people) of 2005-2013 graduates of vocational or higher education (a total of 147,000 people) were abroad according to the data of the Population Register. In addition, 8.5% (12,600 people) were inactive on the Estonian labour market, i.e. no data necessary for carrying out this observation were available in the Tax and Customs Board, the Unemployment Insurance Fund or the Estonian Education Information System (EHIS)⁴. They

³ Personal services graduates are mostly studying at the Estonian Academy of Security Sciences and the Estonian National Defence College.

⁴ No study information was available for 2014.



were not receiving parental benefits or child care allowance paid to parents raising a child up to three years of age or in military service (see Table 4).

Table 4. Status of 2005-2013 graduates of vocational or higher education in 2014.

	Total	Vocational education	Higher education
2005-2013 graduates of vocational or higher education as at the end of 2013 by highest education level	147,266	58,315	88,951
Abroad or unknown	17,941	8,368	9,573
%	12.2%	14.3%	10.8%
incl. those abroad	5,399	2,244	3,155
%	3.7%	3.8%	3.5%
included in Estonian Population Register, status unknown in current study	11,486	5,751	5,735
%	7.8%	9.9%	6.4%
incl. no data available in Population Register	1,056	373	683
%	0.7%	0.6%	0.8%

Source: Ministry of Education and Research, HaridusSilm.ee

Employers are increasingly warning that Estonia's economic development is being hindered by the lack of qualified labour. This overview shows that notwithstanding the shortage of labour, there are thousands of professionally educated people who are inactive on the Estonian labour market. We know that some of them are abroad, but it is much more complicated to determine the status of those whose data for 2014 was unavailable. Are they also abroad, or still in Estonia but cannot find a place for themselves on the labour market? This question remains unanswered.

Given the free movement of labour, the Estonian labour market is strongly influenced by the structural shortage of staff, higher incomes and better working conditions in the Nordic countries. This is also reflected in this analysis. For example, ca 1,100 (15%) of the 7,500 vocational graduates who completed architectural or construction studies from 2005-2013 were abroad in 2014 (see Table 5).

Many of those who completed health studies in a vocational or higher education institution were also inactive on the Estonian labour market. This can also be noted among higher education graduates in the fields of transportation and arts and among VET graduates in the fields of manufacturing and processing, as well as personal services. Veterinary higher education students and graduates include many Finns, which explains the great loss of students in this field.



Table 5. Activity status of 2005-2013 graduates of vocational or higher education in 2014 by field of study.

Field of study	Higher education					Vocational education				
	2005-2013 higher education graduates as at end of 2013 according to highest education level	Abroad or unknown	%	incl. those abroad	included in Estonian Population Register or no data available	2005-2013 vocational education graduates as at end of 2013 according to highest education level	Abroad or unknown	%	incl. those abroad	included in Estonian Population Register or no data available therein
Journalism and information	1,636	120	7.3%	39	81		0		0	0
Architecture and construction	3,020	221	7.3%	69	157	7,532	1513	20.1%	1,118	395
Computer sciences	4,364	394	9.0%	97	264	2,759	319	11.6%	233	86
Life sciences	1,618	178	11.0%	68	111		0		0	0
Physical sciences	1,677	140	8.3%	55	89		0		0	0
Humanities	5,585	799	14.3%	262	493	7	5	71.4%	4	1
Personal services	2,322	292	12.6%	114	181	10,994	1,717	15.6%	1,123	594
Environmental protection	2,003	160	8.0%	58	108	370	50	13.5%	32	18
Arts	4,612	795	17.2%	172	546	1,797	257	14.3%	187	70
Mathematics and statistics	453	32	7.1%	7	29		0		0	0
Agriculture, forestry and fishery	1,493	127	8.5%	43	87	3,559	511	14.4%	369	142
Social and behavioural sciences	5,387	600	11.1%	178	379		0		0	0
Social services	3,311	312	9.4%	145	166	1,301	154	11.8%	80	74
Engineering and engineering trades	4,696	439	9.3%	104	313	12,799	1,744	13.6%	1,296	448
Health	7,555	1,136	15.0%	660	412	683	118	17.3%	69	49
Manufacturing and processing	1,795	180	10.0%	52	118	5,741	908	15.8%	620	288
Transport services	1,804	327	18.1%	48	285	2,284	258	11.3%	178	80
Security services	1,457	40	2.7%	10	38	2,053	134	6.5%	62	72
Veterinary sciences	275	115	41.8%	25	92	13	0	0.0%	0	0
Law	4,837	405	8.4%	98	284		0		0	0
Teacher training and education science	8,221	494	6.0%	212	273		0		0	0
Business and administration	20,830	2,267	10.9%	639	1,427	6,423	680	10.6%	380	300
Total	88,951	9,573	10.8%	3,155	5,744	58,315	8,368	14.3%	5,751	2,617

Source: Ministry of Education and Research, HaridusSilm.ee



BASIC EDUCATION AND RISK OF IN-WORK POVERTY: 20% OF YOUNG PEOPLE NEVER REACH UPPER SECONDARY EDUCATION.

Between 2005 and 2009, the number of basic school (general lower secondary education) leavers in Estonia was 88,000. By the end of 2013, 18,000 (20%) of them had not acquired higher level of education. 60,000 people completed general upper secondary education from 2005-2009, less than half of whom had not acquired vocational or higher education in Estonia by the end of 2013 (see Table 6)

Table 6. General education (general lower or upper secondary education) graduates from 2005-2009 with the same education level by the end of 2013.

Year of graduation	General lower secondary education	incl. those who had not acquired an education level higher than basic education in Estonia by the end of 2013	%	General upper secondary education	incl. those who had not acquired vocational or higher education in Estonia by the end of 2013	%
2005	19,758	3956	20%	11,958	4603	38%
2006	19,212	3985	21%	12,192	4866	40%
2007	17,812	3434	19%	12,457	5602	45%
2008	16,461	3122	19%	12,027	5861	49%
2009	14,855	3512	24%	11,517	6814	59%
2005-2009	88,098	18,009	20%	60,151	27,746	46%

Source: Ministry of Education and Research, HaridusSilm.ee

While the proportion of people who have attained general upper secondary education among the Estonian population is high⁵, the large number of young people who do not progress beyond basic education poses a serious problem. There are too many young people who have not reached at least the upper secondary education level and, whereas some of them will certainly achieve this, those who acquire only lower secondary education are at high risk of becoming bystanders in the world of work and face in-work poverty (see also Figure 1).

⁵At least upper secondary educational attainment among 25-64 years old in Estonia is notably higher than EU28 average (Estonia 2015: 91,1; EU28: 76,5)

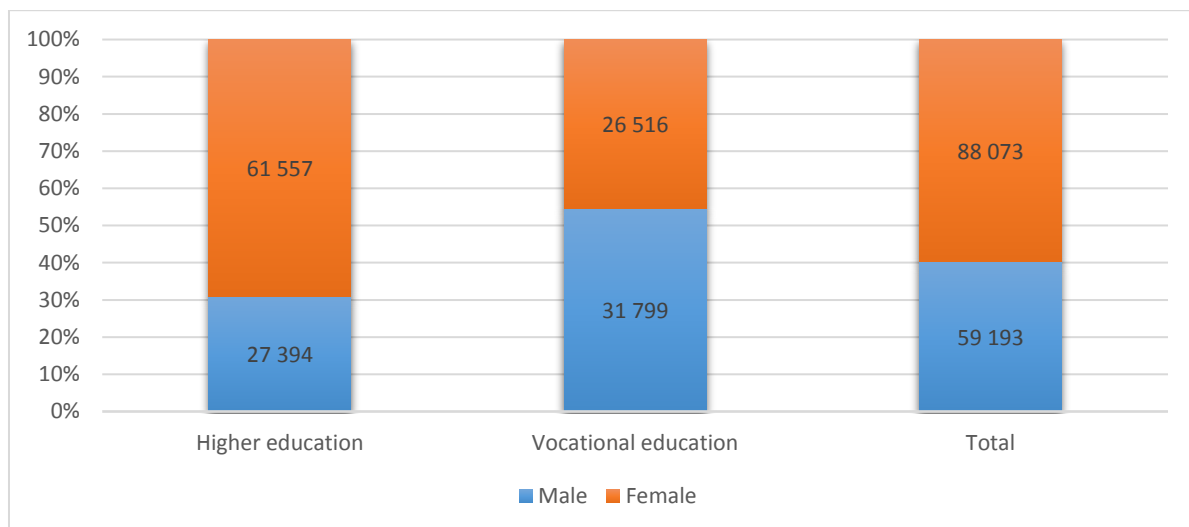
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GENDER-BASED EDUCATION AND INCOME GAP

At the end of 2013, the number of 2005-2013 graduates of higher education was *ca* 89,000 and the number of vocational education graduates *ca* 58,000. There are twice as many female as male higher education graduates, whereas the gender distribution in vocational education is more homogenous (see Figure 2). There are 88,000 professionally educated females and 59,000 males.

Figure 2. Highest education level among 2005-2013 graduates of vocational or higher education at the end of 2013.



Source: Ministry of Education and Research, HaridusSilm.ee

According to the analysis data, the income gap between women and men, without counting any additional factors, is 18%. Particularly noticeable is the income gap among vocational education graduates: women earn 30% less than men. The income gap among BA and MA graduates was 25% and 23%, respectively, while it was 13% among those who hold an integrated Bachelor's and Master's degree and 15% among doctoral graduates. The total income gap is smaller than the income gap by most individual education levels as there are more of them, including women, who have acquired higher education and earning higher income. Even more noteworthy is the income of women with vocational education: 456–660 euros, which could partly explain the low rate of participation of women in vocational education (see Table 7).



Table 7. Average income of 2005-2013 graduates of vocational or higher education in 2014 by gender.

Education level	Total	Male	Female	Income disparities
Doctoral studies	1,623	1,770	1,507	15%
Integrated Bachelor and Master programmes	1,437	1,580	1,368	13%
MA programmes	1,350	1,610	1,236	23%
BA programmes (4 years)	1,318	1,576	1,161	26%
Professional higher education	1,094	1,379	977	29%
BA programmes (3 years)	1,061	1,269	955	25%
Vocational education after upper secondary education	798	998	660	34%
Vocational upper secondary education	757	845	558	34%
Vocational education after basic education	734	798	607	24%
Vocational education without prior education requirement	583	605	456	25%
Total	1,023	1,144	938	18%

Source: Ministry of Education and Research, HaridusSilm.ee

III METHODOLOGY

- The data of the Estonian Education Information System are linked to the data of the Tax and Customs Board, the Social Insurance Board, the National Defence Obligation Register, the Population Register and the Unemployment Insurance Fund.
- The data reflects the highest education level (vocational or higher education) of an individual attained in Estonia as at the end of 2013. This education level was attained between the beginning of 2005 and the end of 2013.
- The average income from work was calculated according to the Tax and Customs Board data containing three types of income: remuneration; remuneration payable to a member of a management board; and remuneration received on the basis of a contract under the law of obligations. The income is presented in a gross amount.
- The average monthly income from work was obtained by dividing the annual income by the number of months during which the income was received.
- A parent or conscript is an individual who did not receive parental benefits or child care allowance paid to parents raising a child up to three years of age or in military service in 2014.
- 'Unknown' or 'abroad' means an individual who, according to Population Register data, was abroad in 2014 or whose data is not available in the registers.
- Difference from previous methodology: This analysis excludes 1% of those receiving the lowest and the highest incomes. Every individual has only one status in the analysis. The average or median income is marked with an X in HaridusSilm if the number of people whose income was calculated was less than three.
- Compared to previous studies, it should be borne in mind that this analysis focused mainly on young people.



The same observation has been made by Statistics Estonia for 2012 and 2013⁶. The data allow the labour market success of individuals who have completed various education levels and fields of study to be analysed, which is, *inter alia*, one of the bases for making education choices, assessing the (actual) need for labour market training and monitoring economic trends.

⁶ http://pub.stat.ee/px-web.2001/Database/Sotsiaalelu/05Haridus/04Hariduse_uldandmed/04Hariduse_uldandmed.asp