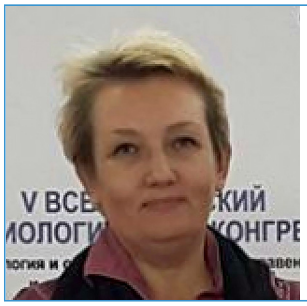
Educational Trends Among Contemporary Russian Youths



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Abstract. This article represents an analytical review of the main trends which were identified based on statistical data for the year 2015 provided by the State policy department in the higher educational field, the State policy department in the field of personnel training and additional professional education (APE), and the Federal State Statistics Service. The authors focused their attention on such issues as the balance between labor market demand and demand for various levels of education among university applicants, the student contingent and its involvement in higher, secondary and primary professional education, admission forecasts. Also considered is an "Atlas of new professions", which describes fields of specializations which will soon appear on the labor market, and professions which will soon disappear from it. Primarily such changes are due to the development of and the demand for information technologies. The main result of the study is the establishment of four currently relevant trends in the field of contemporary Russian education. The first of them has to do with a tendency for mass scale. The second trend is a decrease in involvement in primary professional education and a slight increase in involvement when it comes to secondary professional education, while there has been a drastic increase in involvement in higher professional education. As a result we face a situation when there are not enough specialists in "labor" trades. Trend number three – a disproportionate popularity of certain specialties among applicants given a lack of labor market demand for such an amount of specialists. Trend number four – there is a discrepancy when it comes to professions that are currently popular (be it in economics, education or medicine) and the demands of all sectors of the economy primarily connected with information technologies. The presented data gives the opportunity to bring up statistical data for the years 2016–2017 and "complete" the trends, figure out which of them will remain important.

Keywords: the Bologna system, higher professional education, secondary professional education, primary professional education, atlas of professions, admission forecasts

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Today, the "Education Development for 2013–2020" State Program of the Russian Federation is implemented in our country. It aims to ensure that the quality of Russian education meets people's changing requirements and the long-term development objectives of the Russian society and economy. The program's key objectives include shaping a flexible continuing education system that is accountable to the society, and developing infrastructure and organizational and economic mechanisms for ensuring equal access to and modern quality of education. The consolidated education budget for the period until 2015 amounted to RUB 8 trillion.

The fact that the Russian education system is included in the Bologna system creates quite a number of challenges to the policymakers in the field of education and provides certain benefits to students and applicants. The promising and sought-after training areas for specialists (bachelor's and master's students), the attractiveness of particular specialties to applicants and the social demand are the fundamental indicators used to draw up forecasts for the development of education in the country.

One important aspect of development of the education system in Russia is considering the balance between labor market demand and demand for various levels of education among young people – higher (HPE), secondary (SPE), and primary professional education (PPE).

This article aims to highlight certain trends that may be observed in the field of education at present. Before doing that, it would be logical to review general indicators of the number of Russian youths.

In 2015, over 32.6 million people aged 14 to 30 inclusive resided in the Russian Federation, which accounted for about 22.2% of the total country's population (see Figure 1).

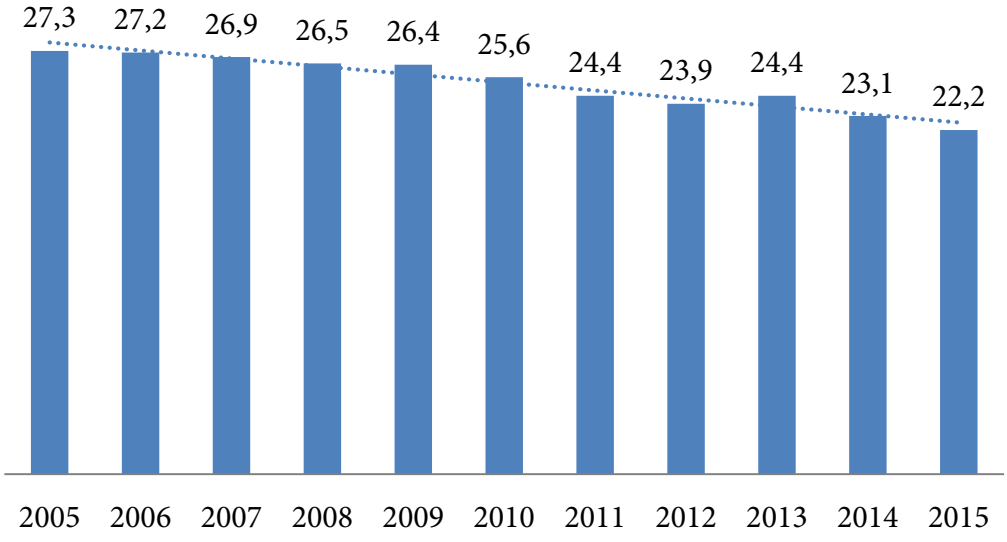

Figure 1. Share of young people aged 14–30 by year, *% of the total population*[1]

[1] The data were provided by the Federal State Statistics Service to the Ministry of Education and Science on April 29, 2016. Before 2015, not considering Crimea and Sevastopol.

According to the statistics data, an increase in the number of higher education institution students was observed until 2009–2010 (see Figure 2). Thereafter, a decline occurred that has continued until present, which is largely attributable to the decreased birth rate in the 1990s. For instance, in 2015, HPE of all forms engaged 479,220 students, SPE – 725,216 students, and PPE – 638,952 students.

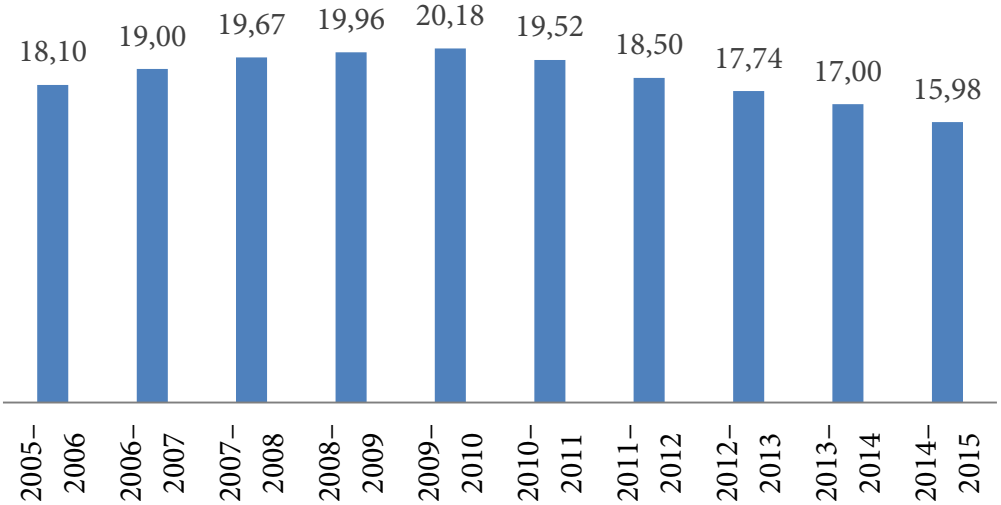

Figure 2. Number of higher education institution students

As of 2015, there were 1,900 educational institutions licensed for educational activities in Russia, of which 1,728 had state licenses[1]. Furthermore, 669 institutions carried out their activities in line with HPE programs, 2,891 – with SPE programs, and 896 – with PPE programs [Education Indicators, 2017].

Based on the data on the number students, it can be seen that the 2013–2015 most popular education areas were "Economics and management", as well as "Humanities", while the trend for a decrease in popularity of the former should be noted.

The least popular areas were "Military science", "Forest resource reproduction and processing", "Geodetics and land management", "Information security", "Aviation, rocket and space engineering", "Weapons and armament systems", and "Instrument engineering and optical engineering" (see Table 1).

[1] The data were provided by the Federal State Statistics Service to the Ministry of Education and Science on April 29, 2016. Before 2015, not considering Crimea and Sevastopol.

Table 1

HPE students in 2013–2015, *% of the total number of students*[1]

2013		2014		2015	
Area					
Economics and management	**30.82**	Economics and management	**28.33**	Economics and management	**25.83**
Humanities	**19.66**	Humanities	**19.49**	Humanities	**20.02**
Education and pedagogy	8.00	Education and pedagogy	8.53	Education and pedagogy	9.12
Health care	4.32	Health care	4.89	Health care	5.54
Architecture and construction	4.04	Architecture and construction	4.17	Architecture and construction	4.07
Transport facilities	3.19	Information and computer science	3.28	Transport facilities	3.48
Information and computer science	3.05	Transport facilities	3.22	Information and computer science	3.37
Agriculture and fishery	3.00	Agriculture and fishery	3.18	Agriculture and fishery	3.22
Energy, power engineering and electrical engineering	2.60	Energy, power engineering and electrical engineering	2.72	Energy, power engineering and electrical engineering	2.79
Metallurgy, mechanical engineering and material processing	2.12	Metallurgy, mechanical engineering and material processing	2.19	Culture and arts	2.24
Service	2.01	Service	2.18	Metallurgy, mechanical engineering and material processing	2.24
Culture and arts	2.00	Culture and arts	2.16	Service	2.12
Geology, exploration and development of mineral resources	1.59	Geology, exploration and development of mineral resources	1.67	Geology, exploration and development of mineral resources	1.77
Natural science	1.52	Natural science	1.66	Natural science	1.68
Automation and control	1.48	Automation and control	1.6	Automation and control	1.67
Health and safety, environmental engineering and environmental protection	1.37	Physics and mathematics	1.43	Physics and mathematics	1.48
Physics and mathematics	1.35	Technology for food products and consumer goods	1.23	Electronics, radio engineering and communications	1.26
Technology for food products and consumer goods	1.28	Electronics, radio engineering and communications	1.23	Health and safety, environmental engi-neering and environmental protection	1.20
Electronics, radio engineering and communications	1.23	Health and safety, environmental engineering and environmental protection	1.18	Technology for food products and consumer goods	1.14

[1] The data were provided by the Department for State Higher Education Policy to the Ministry of Education and Science on October 5, 2016. Before 2014, not considering Crimea and Sevastopol.

Continuation of Table 1

2013		2014		2015	
Area					
Social science	1.20	Social science	1.14	Chemistry and biotechnology	1.07
Chemistry and biotechnology	0.96	Chemistry and biotechnology	1.02	Social science	1.04
Geodesy and land management	0.65	Geodesy and land management	0.72	Geodesy and land management	0.76
Aviation, rocket and space engineering	0.58	Aviation, rocket and space engineering	0.63	Aviation, rocket and space engineering	0.71
Forest resource reproduction and processing	0.51	Marine engineering	0.57	Marine engineering	0.62
Instrument engineering and optical engineering	0.49	Forest resource reproduction and processing	0.53	Forest resource reproduction and processing	0.54
Marine engineering	0.46	Information security	0.47	Information security	0.49
Information security	0.42	Instrument engineering and optical engineering	0.46	Instrument engineering and optical engineering	0.43
Weapons and armament systems	0.05	Weapons and armament systems	0.05	Weapons and armament systems	0.05
Total	**100**		**100**		**100**

In 2015, in terms of the number of students, the following areas took the lead: "Economics and management" – 25.8% (though this percentage is substantially lower than in the previous years), "Humanities" – 20.02%, and "Education and pedagogy" – 9.12%.

The index of youth engagement in HPE was calculated based on the proportion of the number of young people that study at HPE institutions in a given period and the total number of youths in the same period. The figure so calculated is shown as a percentage. Therefore, it may be stated that the youth engagement in higher professional education decreased from 16.62% in 2013 to 14.7% in 2015 (see Figure 3).

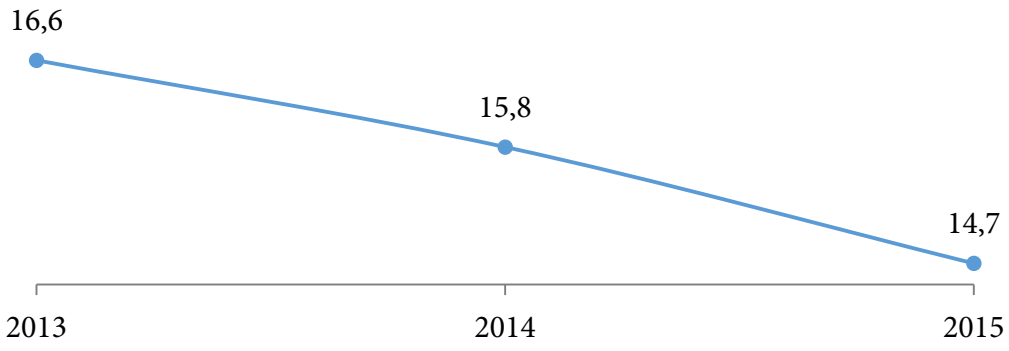

Figure 3. Index of youth engagement in HPE, %[1]

[1] The data were provided by the Department for State Higher Education Policy to the Ministry of Education and Science on October 5, 2016. Before 2014, not considering Crimea and Sevastopol.

Speaking of secondary professional education, we may observe an increment in the number of students of SPE institutions: 2013 – 661,197; 2014 – 693,128; 2015 – 725,216. The engagement index will be considered below (see Figure 4). Be it noted that the proportion of the shares of students aged 14 to 17 and those aged 18 to 29 had remained almost unchanged for three years (see Figure 5). Most young people aged 14 to 17 that are engaged in SPE are noted in the largest constitutional entity of the Russian Federation, Moscow (15.8%). It is followed by the Krasnodar Territory (13.2%) and Republic of Tatarstan (10.6%). The least shares are found in the Jewish Autonomous Region (0.16%), Nenets Autonomous Region (0.09%) and Chukotka Autonomous Region (0.02%).

Speaking of the age group comprising young people aged 18 to 29, the picture is similar: Moscow (15.2%), Krasnodar Territory (10.5%) and Republic of Tatarstan (10.3%). The least numbers of young people engaged in SPE are seen in the Jewish Autonomous Region (0.24%), Nenets Autonomous Region (0.12%) and Chukotka Autonomous Region (0.10%). Overall, for the 14 to 29 age group, the picture is as follows: the largest shares are found in Moscow (15.4%), the Krasnodar Territory (11.5%) and Sverdlovsk Region (10.4%), and the least shares are observed in the Jewish Autonomous Region (0.21%), Nenets Autonomous Region (0.11%) and Chukotka Autonomous Region (0.07%).

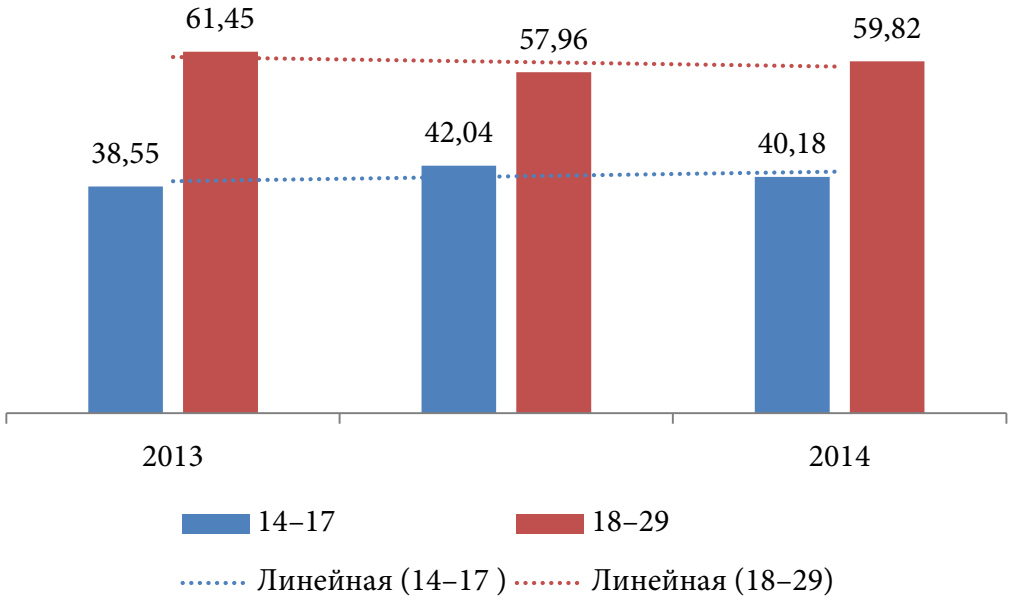

Figure 4. SPE students by age category: 14 to 17 and 18 to 29[1]

The index of youth engagement in SPE was calculated in the same way, as the previous index. In this case, we can see an inverse trend: the youth engagement in secondary professional education increased from 1.93% in 2013 to 2.22% in 2015 (see Figure 5).

[1] The data were provided by the Department for State Policy in Labor Force Training and Further Professional Education to the Ministry of Education and Science on October 5, 2016. Before 2014, not considering Crimea and Sevastopol.

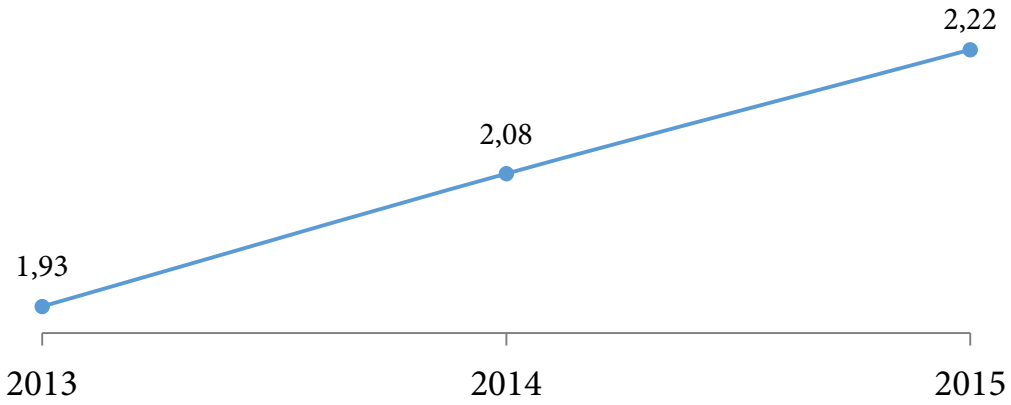

Figure 5. Index of youth engagement in SPE, %[1]

Following its peak achieved in 2011, the number of young people engaged in primary professional education had been consistently decreasing and amounted to 638,952 students in 2015 (see Table 2). The reduced share of the youths aged 14 to 17 that study at primary professional education institutions should also be noted (see Figure 6). This is indicative of the fact that today under-age young people take their time getting involved in labor activities, which may be interpreted as an improvement in the financial standing of their families that enabled deferring their commencement of adult life.

Table 2

Number of young people engaged in PPE by year, *number of students*

2010	2011	2012	2013	2014	2015
578,743	877,438	792,713	728,632	681,540	638,952

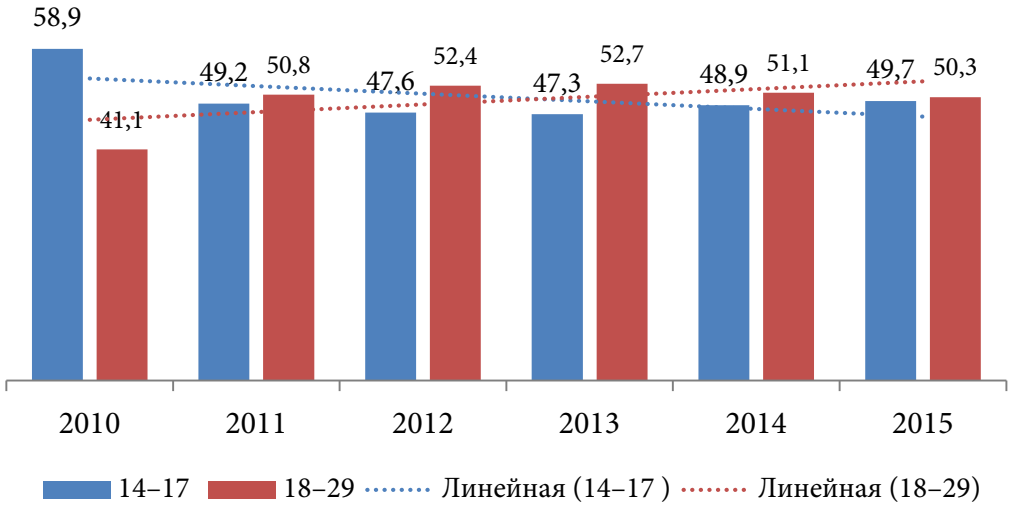

Figure 6. Engagement in primary professional education by age group for 2010–2015, %[2]

[1] Ibid.

[2] The data were provided by the Department for State Policy in Labor Force Training and Further Professional Education to the Ministry of Education and Science on October 5, 2016. Before 2014, not considering Crimea and Sevastopol.

The index of youth engagement in PPE was calculated on the same principle as the HPE and SPE indices. In this case, we can see that the share of those engaged in PPE decreases. Interestingly, in 2011, the engagement share was at its peak (2.43%), but it had been consistently reducing since then to 1.96% in 2015 (see Figure 7). Most young people aged 14 to 29 that are engaged in PPE are found in the Republic of Bashkortostan (4.7%), Rostov Region (3.7%) and Krasnodar (3.5%), and the least of them are observed in the Altai Republic (0.16%), Chukotka Autonomous Region (0.07%) and Nenets Autonomous Region (0.05%).

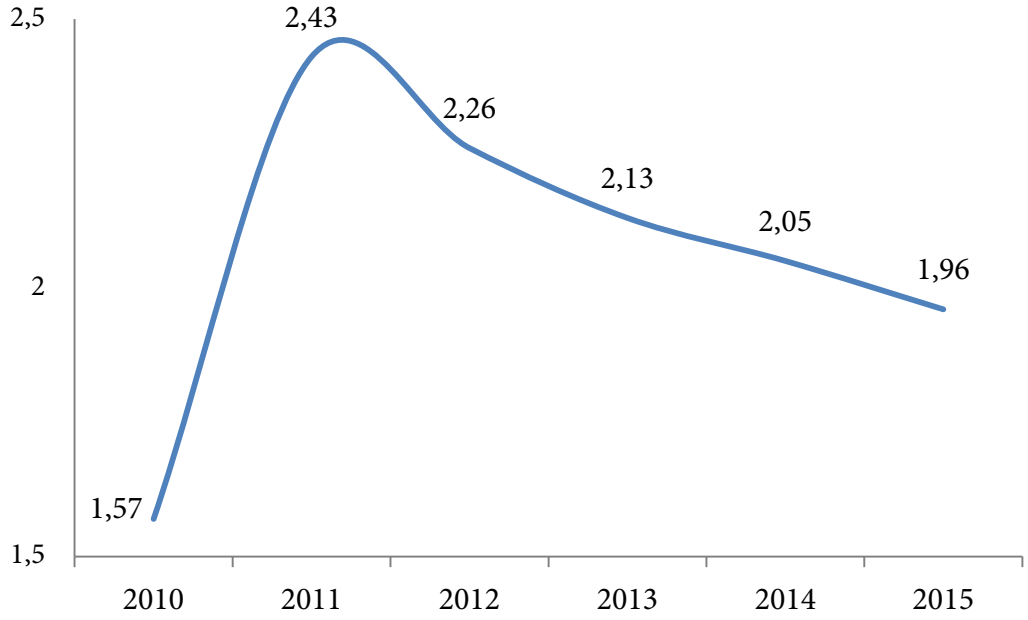

Figure 7. Index of engagement in primary professional education, %[1]

Let us get back to the matter of popularity of certain specialties chosen by the youths in HPE. We have considered the main HPE groups, to which students were allocated in 2013–2015. Additional information on the popularity of various specialties may be obtained from data on the estimated enrollment in HPE areas in 2017 and 2018.

Table 3

Estimated enrollment in HPE areas in 2017 and 2018, *rating*[2]

By specialty Extended specialty/area group name	2017	2018
Economics and management	302,836	317,675
Law	151,711	159,144
Education and pedagogical science	114,431	120,038
Information and computer science	47,084	49,391

[1] The data were provided by the Department for State Policy in Labor Force Training and Further Professional Education to the Ministry of Education and Science on October 5, 2016. Before 2014, not considering Crimea and Sevastopol.

[2] Ibid.

Continuation of Table 3

By specialty Extended specialty/area group name	2017	2018
Clinical medicine	45,925	48,175
Construction engineering and technology	45,044	47,251
Ground transportation engineering and technology	38,334	40,213
Agriculture, forestry and fishery	33,904	35,566
Electric and heat power engineering	33,448	35,087
Mechanical engineering	32,975	34,591
Applied geology, mining engineering, oil and gas engineering and geodetics	30,449	31,941
Linguistics and literature	24,687	25,896
Psychological science	20,729	21,745
Electronics, radio engineering and communication systems	18,697	19,613
Mass media and information and library science	17,301	18,148
Technosphere safety and environmental engineering	14,968	15,701
Service and tourism	14,821	15,547
Engineering systems management	14,789	15,514
Physical education and sports	13,527	14,190
Chemical technology	13,435	14,093
Sociology and social work	12,971	13,607
Industrial ecology and biotechnology	12,906	13,538
Mathematics and mechanics	12,651	13,271
Veterinary medicine and zootechnics	11,845	12,425
Political science and regional studies	11,800	12,378
Earth science	11,421	11,981
Fine and applied arts	9,934	10,420
Cultural studies and socio-cultural projects	8,581	9,001
Physics and astronomy	7,898	8,285
Biological science	7,649	8,024
History and archeology	7,305	7,663
Ship building and water transportation engineering and technology	7,188	7,540
Photonics, instrument engineering, optical and bioengineering systems and technology	6,566	6,887
Information security	6,266	6,573
Architecture	6,218	6,522
Materials engineering	6,117	6,417
Musical arts	5,342	5,604
Aviation, rocket and space engineering	5,136	5,387
Computer and information science	5,108	5,358
Chemistry	5,082	5,331
Pharmaceutical science	4,956	5,199
Performing arts and creative writing	3,661	3,841

End of Table 1

By specialty Extended specialty/area group name	2017	2018
Light industry technology	3,290	3,451
Air navigation and operation of aviation, rocket and space equipment	3,072	3,222
Nuclear power engineering and technology	2,317	2,431
Health science and preventive medicine	1,916	2,010
Physics and engineering science and technology	1,721	1,805
Philosophy, ethics and religious studies	1,716	1,800
Art studies	1,703	1,786
Screen arts	1,400	1,468
Theology	1,295	1,359
Nursing	1,241	1,302
Nanotechnology and nanomaterials	1,064	1,116
Fundamental medicine	816	856
Weapons and armament systems	786	824

Thus, "Economics and management" will remain the most popular education area in 2017 and 2018, followed by "Law" and "Education and pedagogical science". These data are of special interest against the background of information provided in the Atlas of Emerging Jobs [Atlas of Emerging Jobs…] – an almanac of promising industries and occupations for the next 15 to 20 years. It helps us understand which industries will be actively developing; what technologies, products and management practices will be created; and what kind of new professionals will be in demand.

The Atlas highlights 25 industries, in which the most significant changes will occur by 2030, which will lead to the emergence of new professions.

Health care: improved opportunities for prediction and diagnostics owing to new equipment in the future. New professions to emerge: ***bioinformatician, medical equipment designer, and bioethicist.***

Construction: development of fundamentally new architectural solutions enabled by the development of related industries and science. New professions to emerge: ***foreman watcher, environmental analyst in construction and accessible environment designer.***

Security: robotization risks will become the key problem. New professions to emerge: ***remote security coordinator, personal security designer, and business continuity manager.***

Aviation: switching to new types of fuel. New professions to emerge: ***airship designer, operating data analyst, and small aircraft production engineer.***

Culture and arts: a strengthened role of arts, assimilation with other spheres based on which fundamentally new areas, such as "smart art", will emerge. New professions to emerge: ***creative state trainer, personal aesthetic development tutor, and collective art supervisor.***

Education: key trends include remote education based on the development of the electronic educational environment and practice-oriented education. New professions to emerge: ***startup mentor, game master, moderator.***

Tourism and hospitality: a new area called the "impression tourism" – gastronomic tourism, agricultural and ecotourism, spiritual tourism. New professions to emerge: ***individual tour director, tour navigator designer, and space brand manager.***

Media and entertainment: integration of new technology into channels of information perception by a human. New professions to emerge: ***info stylist, media software designer, and media policeman.***

Biotechnology: this is one of the most promising industries – during the coming decades, it will develop itself and have a strong influence on other areas, such as health care, power engineering, basic materials, urban and rural economy. New professions to emerge: ***system biotechnologist, urban ecologist, and biopharmacologist.***

Agriculture: the emphasis is on the environmental friendliness and safety of consumables used in the agriculture. New professions to emerge: ***GMO farmer, city farmer, and automated farming equipment operator.***

Energy generation and storage: the power supply principle of mobile devices will change. New professions to emerge: ***micro generation system designer, recuperation system designer, and energy storage device designer.***

Power grids and power management: modernization of main grids. New professions to emerge: ***energy auditor, power marketing expert, and electric vehicle charging station operator.***

Ground transport: increased engineering capabilities in terms of modeling and implementing transportation patterns in the ecosystem. New professions to emerge: ***cross-logistics operator, smart road builder, and transportation network safety engineer.***

Water transport: multi-modal transportation. New professions to emerge: ***port ecologist, marine infrastructure system engineer, and Arctic navigation specialist.***

Space: breakthroughs in this area are always relevant and expected. New professions to emerge: ***space travel manager, space biologist, and life support system engineer.***

Mining and processing of mineral resources: new professions are associated with technologies that ensure safety of people at production sites – ***mining system engineer, environmental analyst in mining industries, and robotic system engineer.***

Metallurgy: the manufacturing process will become more automated and robotized. New professions to emerge: ***equipment supervisor, advanced metals engineer, and ecorecycler in metallurgy.***

Advanced materials and nanotechnology: new discoveries in this field enable improvements in the properties and durability of materials, mechanisms, and structures. New professions to emerge: ***recycling technologist and smart material designer.***

Robotics and mechanical engineering: virtually, the core of future changes, which forms the basis for alterations in the remaining areas. New professions to emerge: ***ergonomic designer, composite engineer, and children's robot designer.***

Light industry: modification of clothes in line with the requirements of the new intelligent engineering environment: lightweight, sensible, sustainable, and safe. New professions to emerge: ***techno-stylist, advanced fabrics designer, and healthy clothes expert.***

Children's products and services: creation of educational products containing a game component. New professions to emerge: ***transmedia product designer, children's future image expert, and children's R&D manager.***

IT sector: another industry being essential for the modification of the remaining areas. New professions to emerge: ***interface designer, on-line lawyer, and IT preacher.***

Financial sector: new financial tools, such as crowd funding and crowd investing; new, digital code-based currencies (cryptocurrencies) are developing on-line, with other interesting processes underway. New professions to emerge: ***intellectual property appraiser, multi-currency translator, and personal pension plan designer.***

Management: in 2020s, non-hierarchical organizations will play an increased role. New professions to emerge: ***time broker, time manager, and environment auditor.***

Social sector: the emphasis is on switching to the processing of all applications by citizens within an electronic system. New professions to emerge: ***migrant adaptation specialist, government authority communication platform moderator, and crowd sourcing expert for social issues.***

Professions to become obsolete by 2030 (white-collar): accountant, quantity surveyor, credit manager, shorthand typist/transcriptionist, copywriter, proofreader, photo editor, scenic carpenter, librarian, travel agent, test engineer, stunt performer, legal adviser, notary, banking clerk, real estate agent, tour guide, analyst, journalist, secretary/personal assistant, translator/interpreter, government service operator, logistics expert, diagnostician, system administrator, control room operator, navigator, and pharmacist.

Professions to become obsolete by 2030 (blue-collar): ticket inspector, watchman, elevator repairman, parking valet, call center operator, postman, courier, museum attendant, freight train driver, traffic officer, security guard, mining engineer, driver, packer, welder, driller, foreman, sewing machinist, porter, concrete worker, waiter, and coach.

Demographic risks of the past decades have improved the applicants' chances to receive education. Notwithstanding quite low figures of engagement in SPE and PPE, experts have long

indicated the existence of the "mass education" state, which contemplates that the majority of school graduates subsequently get higher education.

Conclusion

In our opinion, the most important trends among young people of our country are those in the field of tiered education system.

The first trend is associated with a tendency for mass scale of HPE. As of today, one in six young men or women is at the stage of receiving higher education (almost 15% of the total number of youths).

The second trend arising out of the first one is a decrease in the engagement in PPE and a slight increase in the engagement in SPE, while there has been a drastic rise in the engagement in HPE. As a result, we face a situation when there is a deficit of blue-collar specialists.

The third trend represents the pyramid of professions imbalance: disproportionate popularity of certain specialties among applicants given the lack of labor market demand for such amount of specialists in these areas.

The fourth trend is the unreasonably low popularity of information technology among applicants choosing their specialties, while it is the very area, which will soon play the most important role and will particularly impact professions that are currently popular, be it related to economics, education, or health care.

It should be noted that certain measures are taken to maintain the balance between the community demand and the demand for various levels of education among graduates: the number of higher education institutions reduces, and enrollment score requirements become more stringent. However, there is still a lot of work to do in this area, as overcoming the key trend for mandatory higher education in the Russians' mass consciousness is quite difficult.

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