UNEMPLOYMENT AND EDUCATION QUALITY IN RUSSIA

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A B S T R A C T

The problem of career guidance for the youth is one of the most pressing social problems in the field of reproduction of manpower resources and human capital. Attempts of its solving in one way or another involve research of the current situation in the labor market by exploring the unemployment rate and the factors that influence it. This refers to the employment statistics that relate to the youth with various education levels. Our conclusions come from the case of Russia at a national level where against the background of the aging population, there are the developed networks of vocational education and resource-rich economy. The analysis of the situation evidences that unemployment affects the youth more than other age groups. When searching for jobs, young people face the difficulties of adjustment and mismatch (or lack) between the gained knowledge/skills and employers' requirements/needs. Having completed correlation and factor analyses, we assessed how much the situation in the labor market depends on the education being received and other aspects of social and economic life. The results obtained suggest that the aggregative factors, such as education, labor supply, and financial well-being have the highest impact on numbers of the unemployed. The influence significance of the education factor (84% versus 6% and 4% of others, respectively) points out the need for harmonization in this field in terms of the manpower training structure and education quality. Different perceptions of education efficiency that students and professors have to confirm this. To some degree, we believe that the solution to this problem might be in a revision of the approach to the provision of educational services, where practice-oriented education should come first.

Disciplinary: Employment and Career Studies, Education (Curriculum Quality Assessment and Evaluation).

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1 INTRODUCTION

The current situation in the labor market has such descriptors, as the decrease in numbers of the

employed, growing unemployment, and longer unemployment periods (Watanabe *et al.,* 2018). The employment problem is especially pressing for young people, who make up a significant part of the working-age population (Punina *et al.,* 2017; Grinevica *et al.,* 2016). One may describe the youth labor market with a wide range of factors. These key factors include the number of young people covered by education and education quality.

Today's educational system is a kind of buffer that minimizes the risks posed by the problems available in the labor market. Educational programs are the most socially attractive tool in the search for solutions to employment challenges in these circumstances (Vasina & Khoreva, 2011). Also note that occupation-education descriptors of manpower resources are among the main factors on which the economic development vector depends (Gnecasheva, 2011; Šileika & Bekeryte, 2013; Aleksejeva, 2016).

There is a clear trend that the competition between institutions of higher education increases with each passing year. The demand for a college is not only generated by students, but also by employers, who evaluate how efficient the training of future professionals is and which knowledge they will gain. Unfortunately, stakeholders have recently with the ever-increasing frequency faced the fact that the knowledge and skills that students gain do not meet market requirements. Pilzer (Smolyakova, 2018) mentions that today's employment market is inefficient in terms of the employer's requests, who often know how to solve the problems that have appeared but are not ready to invest their own money in personnel training. In this scenario, more and more requirements are applied to knowledge, skills, and abilities of students, while for colleges it is now particularly important to know how efficient the skills are that they develop in their graduate students.

The reciprocal demand for educational services shows the aggregate need of prospective college students that lies on various preferences that are very diverse (Minaev, 2012). The problem of career guidance to students is one of the most pressing social problems in the field of reproduction of manpower resources/human capital. The research in this direction involves the identification of the parameters that describe the resources in the system of vocational education to meet the needs of the economy and the high-quality training of professionals.

Therefore, our goal is to evaluate the position of the youth people in the labor market in relation to the education levels of the youth. To do this, we should consider the impact of certain factors in the education sector on the unemployment rate (particularly among the youth) and explore a certain aspect of the education that students get. Note that the demand for the research findings depends on national demographic settings, the educational system development, and economic potential. The case of Russia is a good example in this regard where against the background of the aging population, there are the developed networks of vocational education and resource-rich economy (Grinin & Shestemirova, 2015; Kheyfets & Chernova, 2019; Chernova *et al.,* 2019). This led to the choice of Russia as an object in our research.

2   LITERATURE REVIEW

Vocational training of students and the development of their skills are performed as the provision of educational services. Educational services refer to the totality of activities and products, aimed at

meeting the learning need of an individual (Kuzmina, 2010), the totality of the information, skills, and abilities that the individual uses for his/her personal ends or for his/her job (Schetinin, 2008).

The system applied for students' knowledge and skill control/tests have become an essential element in the education process. Both at the level of didactics, and methodology, there are papers on training efficiency evaluation (Litau, 2018; Shakhnov *et al*., 2013; Vlasov *et al*., 2019; Yudin *et al*., 2017). In large measure, the efficiency evaluation of the tools used for students' knowledge acquisition is like the quality evaluation of college operations, because the education success depends on the techniques they have chosen. College accreditation is one of such formal evaluation techniques. In Russia, the system of accreditation by type includes public, career and community, and international accreditations. In general, key indicators for education quality evaluation are included in the Education Act (RF, 2012). We believe that the alumni employment rate is a key parameter in the time of the evaluation. Qualitative (or efficient) employment might refer to alumni employment in line with relevant qualifications and with balanced wages (Butakova & Beliaeva, 2016) that does not result in the brain drain.

In today's' conditions, there is a wide discrepancy in the structure of graduates' output by degree/field of expertise and needs in the labor market. As a result, alumni are not often employed in the specialty. Young employees are often in positions that do not require high levels of education. In extremis, young employees refuse from working because of excessive requirements (Dembitskaya, 2010). We might explain the latter with a qualifying level of education. Most researchers believe that the proportion of the unemployed alumni is higher than among the people with lower levels of education, for whom it is easier to find a job for the first time and who remains not in demand for the fewer periods (Tangian, 2004). Moreover, recent alumni are much more vulnerable in the labor market compared to more experienced employees because they lack employment experience, have a poor understanding of laws in the labor market, and are likely to be for the dismissal in case of economic crises (Ryan, 2001; Rudakov, 2015).

Researchers point out to the fact that the alumni who have not found positions in specialty get significantly lower wages and are employed on the positions where they do not use their education (Gimpelson *et al*., 2009; Nordin *et al.,* 2010). For instance, in the United States, positions of 20% of alumni from colleges and vocational schools are not related to the completed education (Robst, 2007). Also, in Sweden, 20% of the employed do not work in a specialty (Nordin *et al.,* 2010). In Russia, according to various data, 60-73% of the economically active population does not work in the specialty, while every fourth college alumnus is on the position that does not require higher education (Timoshenko, 2018). This causes various values of the return on education. In contrast to the primary vocational-technical education, which practically does not provide statistically significant advantages compared to secondary (complete) general education, the secondary vocational-technical education shows positive return values, although significantly less than the return on higher education (Denisova & Kartseva, 2007; Gimpelson & Kapelyushnikov, 2011; Roshchin, 2006; Rudakov, 2015). The desire of the youth to improve and expand their knowledge, including through higher education, is indisputable evidence of the growing value of education (Volchik & Maslyukova, 2017). However, it is always necessary to keep in mind personal capabilities for successful learning

under educational programs (Garces-Voisenat, 2016), as well as market needs.

Returning to unemployment, note that the increase in total numbers of the unemployed causes the maximum damage to the least educated and low-paid employees (Farrell *et al.,* 2011). As a result, a price of an error gets higher when alumni start working as an initial stage in a career has a significant impact on the development of future wages (Robst, 2007; Zhang, 2008). The solution to this situation is the development of the dual system of education (Ilyazova & Ilyazova, 2016; Alcalde & Nagel, 2016) when theoretical and practical parts of training are closely interconnected and alternately follow each other throughout the entire education process. Lavrentiev *et al.* (2004) believe that the education process should have a clear focus on the development of logical thinking in making decisions that might be related to future careers. Research-production collaboration also contributes to learning success.

Other effects are directly related to the proactive participation of individuals in the education process. The overlapping of studies and employment in specialty increases chances for the future employment of alumni compared to those who had no employment in a time of studentship. At the same time, in the case of employment not in a specialty, the effect is not significant (Roshchin, 2006). Vasiliev *et al.* (2015) found that the overlapping of studies and employment develops various soft skills (time management, responsibility, and other skills), which are in demand in the labor market. This confirms the idea that the unemployment depends on the sufficiently large number of factors (Salin *et al.,* 2016) that reliably include the demographic situation, socio-economic conditions, and, for sure, education, a role of which is diverse. Therefore, the return on education, depending on various characteristics of the education process itself, needs further research.

3   METHOD

Uncertainty in the evaluation of the education quality efficiency is in constant growth. To make it lower, stakeholders thoroughly examine a college rating, students' and alumni's feedback of the establishment, equipment level, training fee, etc. But we also need to consider qualitative factors. In the framework of our research, the analysis includes two parts. We might call the first part *general* as it provides an idea of combined results of activities of establishments of higher education. The second part provides an idea of the students' training level and the efficiency of educational programs. See the set of indicators in Table 1.

The analysis of indicators was performed with the techniques of descriptive statistics and time series, such as the absolute growth, growth coefficient, growth rate, and accession rate.

To find a degree of relationship between the studied attributes, we used correlation and factor analyses. We built the correlation matrix. The matrix is based on the calculation of the Pearson correlation coefficient. We checked the correlation between numbers of the unemployed and the following parameters: numbers of the unemployed; loading of the registered unemployed; numbers of alumni (mid-level); average consumer spending per capita; numbers of the families that have received housing and utility subsidies; establishments of general education; numbers of alumni (bachelors, specialists, and masters); indebtedness in roubles under the credits provided by credit; organizations to individuals; holdings (deposits) of individuals on rouble accounts; the number of enterprises and organizations; demand for employees as claimed by an employer; numbers of foreign

citizens with valid work permits. According to the null hypothesis (H0), there is no correlation between factors and parameters.

Table 1: Set of indicators to evaluate the education quality

Indicator	Calculation technique and data source
Many establishments of higher education (public and municipal) institutes.	The indicator approved by the order of the Federal State Statistics Service, "Information on the Educational Establishment that Performs Educational Activities under Educational Programs of Higher Education" (Form No. ВПО-1) Source: Ministry of Science and Higher Education of Russia
Funding allocation to establishments of higher education	The indicator approved by the order of the Federal State Statistics Service, "Information on Facilities and Information Base, Financial and Economic Activities of the Educational Establishment of Higher Education" (Form No. ВПО-2) Source: Ministry of Science and Higher Education of Russia
Number of students in establishments of higher education (public and municipal), persons	The indicator approved by the order of the Federal State Statistics Service, "Information on the Educational Establishment that Performs Educational Activities under Educational Programs of Higher Education" (Form No. ВПО-1) Source: Ministry of Science and Higher Education of Russia
The students enrolled in establishments of higher education, persons	The indicator approved by the order of the Federal State Statistics Service, "Information on the Educational Establishment that Performs Educational Activities under Educational Programs of Higher Education" (Form No. ВПО-1) Source: Ministry of Science and Higher Education of Russia
Specialist level graduates from establishments of higher education (public and municipal), persons	The indicator approved by the order of the Federal State Statistics Service, "Information on the Educational Establishment that Performs Educational Activities under Educational Programs of Higher Education" (Form No. ВПО-1) Source: Ministry of Science and Higher Education of Russia
Number of full-time graduates (except for students with a full reimbursement of training fees) who as desired were granted with the free employment right	The full-time graduates (trained at the expense of budgets of all levels for the period from October, 1 of the previous year to September 30 of the current year), who have not received an employment placement document as desired. Source: Rosstat (before 2012) and Ministry of Science and Higher Education of Russia
Number of employed graduates from educational establishments by a group of professions (specialties)	Source: Rosstat
The proportion of employed alumni from educational establishments in the total number of alumni by the level of vocational education	The ratio of numbers of employed alumni to a total number of alumni from educational establishments Source: Rosstat
Number of the unemployed by gender and age group	The persons aged 15+, who in the period under consideration simultaneously met the following criteria: they were unemployed (without gainful business), in a search of work in recent four weeks preceding the survey week, ready to start working during the survey week (according to the ILO methodology) Source: Rosstat

To verify the appropriateness of the factor analysis, we involved the criterion of the sampling adequacy by Kaiser-Meyer-Olkin (KMO) and Bartlett's sphericity test. The factor analysis lies in the method of principal components that makes it possible to reduce the space dimension with the least loss of information. To identify principal components, we used the Varimax-rotation technique with the minimization of variables with a high factor load. We performed correlation and factor analysis

using the SPSS statistical software.

We referred to the data provided by the following principal and official sources of information that show ф status quo in the system of higher education in Russia: Rosstat, Ministry of Science and Higher Education of Russia, and Federal Service for Supervision in Education and Science. Besides, we used the information provided by rating agencies: Expert RA (RAEX) and RIA Novosti (RIA, 2019) that calculate a research-level at colleges, employers' demand for college alumni, applicants' training level by the scores gained at the Unified State Exam.

Along with quantitative descriptors, the evaluation of the efficiency of knowledge that students learn is also described with qualitative indicators. To do this, we propose to use the survey technique in a form of the questionnaire. The sample observation is performed with the nonrepetitive selection, while average and marginal sampling errors are calculated.

4   RESULT AND DISCUSSION

To evaluate the efficiency and education quality, we need to analyze development trends in the system of higher education and employment of college alumni.
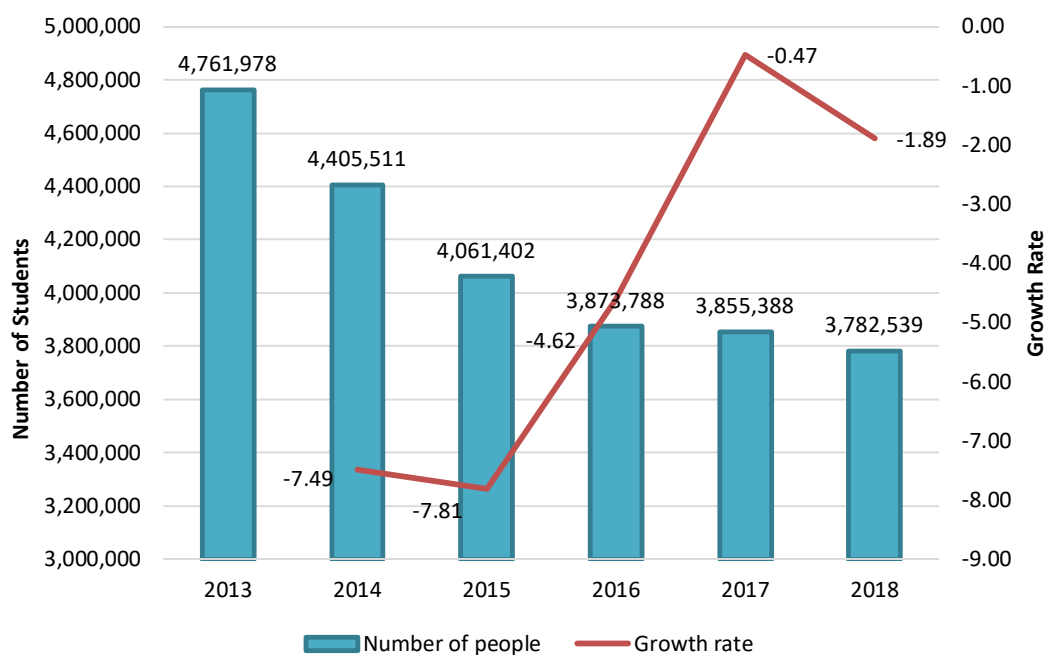

Figure 1: Numbers of students in establishments of higher education in Russia (public and municipal), people Source: Ministry of Science and Higher Education

In 2018, there were 496 public and municipal establishments of higher education in Russia (Ministry of Science and Higher Education of Russia; Higher School of Economics). In the period under consideration from 2013, their number decreased by 82 institutes. In 2017, the Federal Service for Supervision in Education and Science (Rosobrnadzor) suspended 35 licenses among establishments of higher education. The admission of applicants was banned in 68 colleges and their branches. 58 colleges lost their governmental licenses for educational activities. Thus, in 2014-2017, the number of colleges and their branches in Russia decreased by 1.097 (from 2.268 to 1.171). The

reduction mostly covered branches of governmental and non-governmental colleges, their number decreased to 428 and 81, respectively. The largest governmental colleges also suffered losses in that period, their number decreased by 83 (from 567 to 484), while non-governmental by 193 (from 371 to 178).

In 2013-2018, the number of students decreased from 4.8 million to 3.8 million persons (Figure 1). In general, in 2018, compared to 2013, the number of students enrolled by public and municipal institutions of higher education decreased by 2.36% (25.176 persons). In 2009-late 2018, the overall reduction in the number of students is 40%.

In 2018, compared to 2005, the number of alumni from full-time studies with the granted free employment right increased by 34,445 people or 77.16% (Figure 2). In contrast to the situation in 1995-2003, described by Roshchin (2006), today the studies-employment transition of system graduates looks more like a ford than a deep end. In late 1990, there was a slight reduction in employment scales of alumni with job placement documents both in absolute values and the specific gravity. Later, there was a clear upward trend, leading to the growing total numbers of employed college alumni.
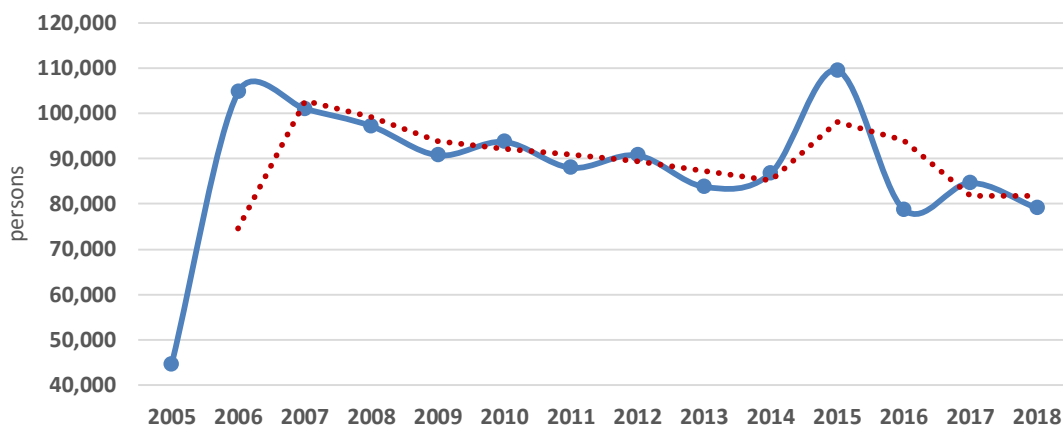
Figure 2: Numbers of alumni (full-time studies) (excluding those with full reimbursement of training fees) in the public and municipal educational establishments that provide programs of higher vocational education with the given right of free employment as desired (Source: Rosstat). The dot line indicate moving average with n = 2.
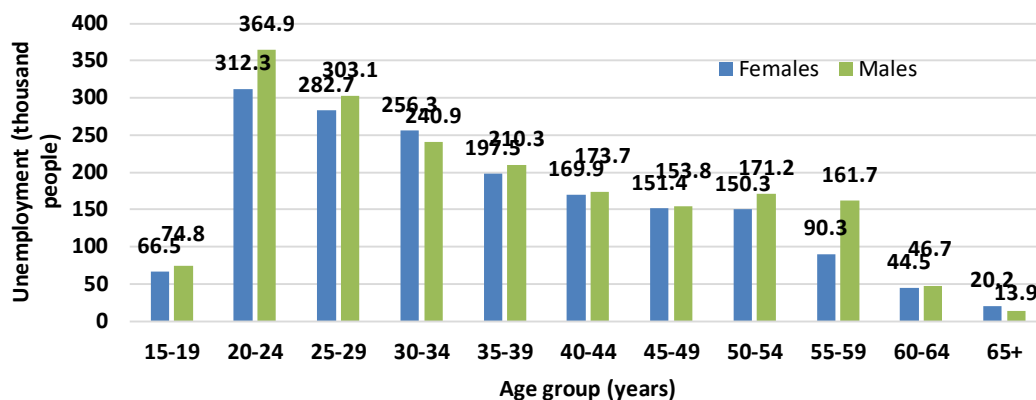

Figure 3: Numbers of the unemployed by gender and age group in Russia as of 2018, (thousands of people) Source: Rosstat

To find out how strongly the parameters of the education being obtained influence the current unemployment rate, we performed the factor analysis (Table 2). This made it possible to conclude about the dependence between education and the unemployment rate.

Table 2: Primary parameters in the factor model.

Index	Parameter
Y	numbers of the unemployed
X_1	loading of the registered unemployed
X_2	numbers of alumni (mid-level)
X_3	average consumer spending per capita
X_4	numbers of the families that have received housing and utility subsidies
X_5	establishments of general education
X_6	numbers of alumni (bachelors, specialists, and masters)
X_7	indebtedness in roubles under the credits provided by credit organizations to individuals
X_8	holdings (deposits) of individuals on rouble accounts
X_9	number of enterprises and organizations
X_{10}	demand for employees as claimed by an employer
X_{11}	numbers of foreign citizens with valid work permits

To explain the relationship between variables, we calculated the correlation dependence (Table 3). Based on the results obtained, we might conclude that such indicators, as average consumer spending per capita (X_3), the load of the registered unemployed (X_1), deposits of individuals (X_8), and numbers of foreign citizens with valid work permits (X_{11}) have a very small impact on numbers of the unemployed. So, it makes no sense to include them in further analysis. At the same time, education-related indicators have a strong influence on the numbers of the unemployed. There are the number of establishments of general educational (X_5), numbers of bachelor, specialist, and master graduates (X_6), numbers of graduates from vocational-technical schools (X_2). This might relate to the fact that due to a large number of educational institutions, and, consequently, high numbers of national graduate students enterprises are not able to provide a required number of jobs as the number of jobs is lower than the number of alumni and it leads to intense competition in the labor market.

Table 3: Correlation matrix of factor model's parameters

	Y	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}
Y	1.00											
X_1	0.19	1.00										
X_2	0.90	-0.06	1.00									
X_3	0.05	-0.43	0.26	1.00								
X_4	0.69	-0.11	0.79	0.35	1.00							
X_5	0.88	0.01	0.93	0.17	0.72	1.00						
X_6	0.80	-0.11	0.91	0.34	0.73	0.85	1.00					
X_7	0.69	-0.28	0.86	0.46	0.82	0.79	0.76	1.00				
X_8	0.40	-0.11	0.55	0.39	0.73	0.50	0.49	0.81	1.00			
X_9	0.80	-0.25	0.92	0.45	0.79	0.84	0.90	0.88	0.57	1.00		
X_{10}	0.60	-0.61	0.77	0.49	0.72	0.68	0.74	0.85	0.54	0.85	1.00	
X_{11}	0.33	-0.46	0.46	0.52	0.53	0.39	0.42	0.65	0.50	0.59	0.70	1.00

The calculated value of the Kaiser-Meyer-Olkin (KMO) criterion is 0.907. Hence, the usage of factor analysis is appropriate. The factor analysis should be considered suitable if KMO is 0.5-1.

We used Bartlett's test to test the *null hypothesis (H0)* for the lack of the correlation between

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parameters. To check the hypothesis, we calculated χ^2 statistics based on the correlation matrix determinant. If the value is lower than the threshold value 0.05, then we need to reject the null hypothesis (*H0*) and the factor analysis is reasonable. In the result obtained $\chi^2 = 819.173$ (number of degrees of freedom is 21), the null hypothesis (*H0*) is rejected as the p-value is <0.001.

At the next stage, it is necessary to find out which proportion (%) of the dispersion of each factor is explained by principal components. The first principal component is the most valuable as it explains the highest percentage in the dispersion. The first component was 84.129%, the second was 6.082%, while the third was 4.227%. This makes it possible to explain 94.5% in the dispersion. See the data of the explained cumulative dispersion in Table 4.

Table 4: Explained cumulative dispersion

Principal components	Initial eigenvalues		
	Total	% dispersion	Total, %
1	5.889	84.129	84.129
2	0.426	6.082	90.211
3	0.296	4.227	94.439
4	0.175	2.494	96.933
5	0.104	1.488	98.420
6	0.066	0.942	99.362
7	0.045	0.638	100.000

Then, we have produced the eigenvalue matrix of principal components using the Varimax rotation method (minimizing the number of variables with the high factor loading). See the results in Table 5.

Table 5: Rotated component matrix

Parameter	Principal components			Factor
	1	2	3	
X_5	0.852			Education
X_6	0.817			
X_2	0.792			
X_{10}		0.862		Labor supply
X_9		0.603		
X_4			0.835	Financial well-being
X_7			0.550	

Having explored the abovementioned signs, we might conclude that the following factors make the highest impact on numbers of the Russian unemployed: education, labor supply, and financial well-being.

The second part of the analysis includes the efficiency evaluation of the knowledge that students learn. For this, we used the sample survey technique based on the survey of college students and professors in Russia (Table 6). The sample included 200 people, students and professors, half and half. The survey was on the Internet via the Google form. The profiles with answers to all the questions in the form were randomly selected from the aggregate.

Table 6: Results of the survey on the efficiency of knowledge test techniques (tools).

Description	Factor's numerical values	Distribution of respondents	
		Students	Professors
The system applied for the evaluation of the efficiency of students' knowledge test techniques (tools)	1, satisfactory	60	34
	0, not satisfactory	40	66
Labor market demand for graduates from a specific college	1, in demand	35	43
	2, most often in demand	25	22
	3, they sometimes have difficulties	30	27
	4, not in demand	10	-
	5. if they were undecided	-	8
Feedback on educational programs and their provider	1, positive feedback	55	76
	0, negative feedback	45	24
Level and quality of teaching under a specific educational program	1, very important	30	62
	2, rather important	45	25
	3, rather not important	15	10
	4, not important at all	10	3

Having compared the survey results, we might conclude that there is a difference in the efficiency evaluation of the methods (tools) for knowledge tests. Thus, 40% of students rated them as unsatisfactory, unlike 66% of professors. Regarding the evaluation of the labor market demand for graduates of a college, 60% of students believe that they are more in demand than not. So do 65% of professors. Feedback reviews on educational programs and the educational institution that provides them, differ, i.e., 55% of students believe that feedback is positive, while as for the professors, this percentage is 76%. The level and quality of teaching under the specific educational program was rated as important by 75% of students and 87% of professors. According to the data obtained, we might conclude that students and professors differently perceive efficiency evaluation systems for knowledge test methods.

5 CONCLUSION

The specifics of the economic and social development in Russia is the main reason for youth unemployment. Having completed the factor analysis, the factors have the greatest impact on numbers of the unemployed, including 1) education (with the indicators of the number of institutions of general education, bachelor, specialist, and master's degree graduates, and graduates from vocational-technical schools), 2) labor supply (with the indicators of the number of the enterprises and organizations, the need in employees declared by employers), and 3) financial well-being (with the indicators of the number of families that received housing and utility subsidies, loan debt). The weight of the education factor influence (84%) points out to the need for harmonization in this field both in terms of personnel training structure and education quality. The major problem lies in the imbalance between the knowledge, skills, and abilities that graduates have obtained and market requirements. The research findings evidence that students and professors differently perceive efficiency evaluation systems for knowledge test methods. In some measures, the solution to this problem will be the revision of the approach to the provision of educational services, where practice-oriented training should come first.

6 AVAILABILITY OF DATA AND MATERIAL

The corresponding author will be liable to provide information regarding this paper.

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