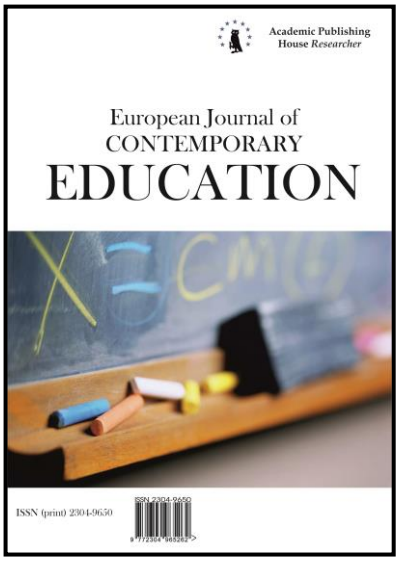
Published in the Slovak Republic
European Journal of Contemporary Education
E-ISSN 2305-6746
2020, 9(4): 710-725
DOI: 10.13187/ejced.2020.4.710
www.ejournal1.com



The Problems of Contemporary Education

Students' Perceptions of Quality in Higher Education and Career Choices: A Case Study of the Russian Industrial Region

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Abstract

The transition to a new technological structure and mass digitalization of society involves revision of the existing forms and methods of educating students for the needs of the Industry 4.0. The problem arises from higher education non-compliance with the expectations of society, the modern requirements of the economy and the labor market. For regional higher education institutions, the situation is exacerbated by the high level of educational and labor migration of young people. This leads to negative trends in demographic indicators as well as to deficits in the regional labor market and to decrease in regional socioeconomic potential.

The study is based on the data from the sociological research conducted by the authors, as well as on the secondary data analysis. At the stage of data analysis in the SPSS 25 functional environment primary data were processed and the results were presented using descriptive statistics methods; an in-depth analysis of empirical information was carried out using multidimensional methods of analytical statistics, including the Pearson's $\chi 2$ significance test and the procedures of factor analysis ($p < 0.001$); non-formalized analysis of the qualitative research materials add statistical data were carried out.

The study revealed the opinions of university level students on the quality of the education they receive, on the problems of gaining professional skills and competencies in the education

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process, the possibility of implementing individual educational trajectories, migratory moods and future plans after graduation. A number of measures are proposed to modernize the regional system of higher education, including the use of opportunities of targeted training, the organization of interaction with business enterprises in the region, the network interaction of higher education institutions, the potential of WorldSkills contests, as well as the implementation of new approaches in the organization of education, student practicums and internships.

Keywords: higher education, students, quality of education, career choices, professional trajectories, competencies, skills, human capital, targeted education.

1. Introduction

The relevance of the study is determined by contemporary challenges facing Russia's entire education system and higher education in particular. The transition to a new technological structure and mass digitalization of society involves revision of the existing forms and methods of education to meet the needs of the new economy. In this regard, it seems useful and significant to identify and analyze the opinions of Russia's tertiary level graduates on motivations for acquiring a profession, the quality of education, issues associated with professional training and ideas about possible professional trajectories.

The problem is that tertiary education does not meet the expectations of society, the modern requirements of the labor market, current and future demands of the economy. For regional tertiary education institutions, the situation is exacerbated by the high level of educational and labor out-migration of young people. This results in the formation of negative demographic trends, in the occurrence of deficits in the regional labor market and in a decrease in regional socioeconomic potential.

The regional context

Kemerovo Oblast (Kuzbass) is a constituent entity of the Russian Federation and is a part of the Siberian Federal District. It is an industrial region with coal production, metallurgy, mechanical engineering and chemical industry as its main economic resources. The population of the region is about 2.657 thousand people. Most of the citizens live in the cities, the largest of which are Kemerovo, the administrative center of the oblast, and Novokuznetsk. There are a lot of ecological, economic and social problems in the Kuzbass, which do not contribute to the region's attractiveness. According to main social and economic factors, the oblast is in the middle of other Russian regions. However, it is characterised by a significant drop in the population and there is a large percentage of youth out-migration, unemployment, death, and crime rates.

The higher education institutions are located mainly in two major cities and have a rather narrow range of specialities. When it comes to university rankings, none of the region's universities is listed as a university of federal importance (a federal university, a national research university, a strategically important regional university, a university that is a 5-100 project participant). These circumstances and the living standard of the population do not contribute to keeping young specialists and finding their niche in the region. In this relation, it is crucial to adapt the system of regional higher professional education to the development of new competences and the establishment of a strong relationship with regional enterprises and build educational programs in accordance with the interests of the regional labor market.

The aim of the study is to analyze the status and existing problems in the tertiary education system in one of Russia's industrial regions and develop recommendations that would improve tertiary education institutions in the region, increase the attractiveness of regional education and weaken youth out-migration to other regions and abroad.

2. Discussion

Current research on higher education system examines various aspects of its functioning. Much attention is paid to ensuring equal and free access to post-secondary education. This topic is developed most actively in countries with certain barriers to education (Wu et al., 2020; Guan, James, 2019). Chinese researcher L. Wu et al. note that with the increasing number of universities in China, the availability of higher education has not changed significantly, as other factors of inequality have remained, in particular, high tuition fees at elite universities. The results of the study show that, with the exception of gender inequality, family economic status and parents' education level, all other factors of inequality remain persistent regardless of the increase in the

number of universities. S. Guan & F. James (2019) analyze this problem in terms of national isolation of some groups of students and suggest ways to overcome the isolation in the process of learning and interaction in the group.

A number of works in the field of accessibility of education are devoted to the territorial factor, i.e. location of the universities across the country (Ying et al., 2017; Dong et al., 2020). Thus, by using the example of Chinese universities, N. Dong et al. demonstrate the influence of regional characteristics, territorial situation and forms of management on the organization success and competitiveness. It is noted that raising the prestige and improving the quality of education are directly linked to those factors. This comment is particularly relevant for the context of this article.

A number of authors pay great attention to the starting positions of potential students and the factors that influence their choice of specialty and educational institution (Stensaker et al., 2019; Jin, Ball, 2019; Lehmann, 2019; Webb et al., 2017). J. Jin & S. Ball (2019) consider this issue from the point of view of the social status of individuals. They believe that people from working class families are more difficult to achieve educational success, as they experience not only academic difficulties, but also have to overcome barriers of inequality, lagging in basic training and some other problems. The same trend can be seen in an article written by W. Lehmann (2019) who, in addition to undergraduate education, considers the problems of transition to a Master's degree. S. Webb et al. (2017) use the example of universities in Britain and Australia to consider the extent to which higher education contributes to social mobility and what factors influence this process.

Researchers' interest in studying the factors that affect the quality of education is also high (Musso et al., 2020; Flores et al., 2020). Beyond traditional methodological approaches to the analysis of those factors, such as academic performance, personal creative achievements, internships, a number of research papers offer new, non-linear analysis capabilities, i.e., artificial intelligence, neural networks, which allow assessing the educational success and future trajectory of university graduates in a different way (Musso et al., 2020); or innovations in systems for evaluating students' knowledge and skills in the framework of the assessment model based on responsibility, engagement, success and performance (Flores et al., 2020).

Considerable attention of researchers is focused on an analysis of students' motivation to pursue their studies at a particular academic level, when they decide whether to opt for bachelor's or master's degrees. The study conducted by T.D. Le et al. (2020) suggests that future job prospects, quality of teaching, staff experience, and the current content of training courses are the determining factors of this choice. The authors place special emphasis on parental influence upon their children's career choice.

Some authors (Gallardo et al., 2020; Losada et al., 2019; Macfarlane, 2020; Espinosa et al., 2018) suggest that modern educational technologies, digitalization of education and digital learning opportunities have a direct impact on the quality of education, the competitiveness of graduates and their subsequent professional success.

M. Tomlinson & D. Jackson (2019) analyze employment strategies of university graduates. Some other authors consider the prospects of graduates in terms of forming their identity as a bridge between tertiary education and future employment, as well as other resources, in particular social and cultural capital that students acquire before entering the labor market (Macfarlane, 2020; Ryan, Lőrinc, 2018). A.-M. Bathmaker (2017) also analyzes various educational trajectories of graduates and feasibility of their transition to the next stage of education or entering the labor market. The author uses data from a comparative study of students' educational choice in the Netherlands and China. She makes a conclusion that among students in different parts of the world the motives of choice are very similar and the factors influencing them largely coincide.

Thus, the topic of this paper is relevant and intersects in many aspects with the scientific developments of colleagues from different countries (Cotronei-Baird, 2020; Harris-Reeves, Mahoney, 2017).

3. Materials and methods

The work is based on the data of the sociological study "A Comprehensive Analysis of the Education System in the Kemerovo Region" (Aleshkovsky et al., 2019) conducted by the authors as part of the Vernadsky Consortium Program, and also on the analysis of secondary data from Russian and foreign research works (Wu et al., 2020; Lehmann, 2019; Flores et al., 2020; Gromov et al., 2016; Bondarenko et al., 2017; Monitoring..., 2018). Data collection at the level of the tertiary

education system in the Kemerovo Region included three categories of respondents, i.e. graduate students from all the region's tertiary educational institutions, heads of those institutions and their departments, and experts. The survey of the students and the heads was carried out by means of a questionnaire using Google Forms. The experts were surveyed using in-depth interviews. In all, 1,472 students, 40 faculty deans and 22 experts (the region's educational administrators, heads of tertiary education institutions and representatives of key employers) were surveyed (margin of sampling error is 3.5 percentage points).

The research tools were developed proceeding from the goals and objectives, state policy in the field of education in Russia, and taking into account some characteristics of the region. The latter included an increasing year by year outflow of school graduates to other regions to continue their education, the out-migration of recent graduates to continue their education or work, a high level of youth unemployment, an imbalanced nomenclature of professions available at the region's tertiary education institutions, etc.

At the stage of data analysis in the SPSS 25 functional environment, primary data were processed and the results were presented using descriptive statistics methods; an in-depth analysis of empirical information was carried out using multidimensional methods of analytical statistics, including the Pearson's $\chi 2$ significance test and the procedures of factor analysis; non-formalized analysis of the qualitative research materials add statistical data were carried out.

4. Results

The objectives of the tertiary education system, which is part of the national project "Education", is the further development of tertiary education institutions, enhancing their competitiveness among the world's leading scientific and educational centers, getting talented youth and leading scientists attached to the region, and also the "formation of the university centers for innovative, technological and social development of regions whose activities are based on partnerships with business enterprises in terms of solving the problems of socioeconomic development of the Russian Federation's constituent entities through the saturation of regional labor markets with well-trained professionals." (Report of the Government..., 2018).

According to official sources, the Kemerovo region's education system included, as of the 2018/2019 academic year, 7 state tertiary education institutions and their 15 branches, among them, those of other regions' tertiary education institutions. The region's tertiary education institutions prepare specialists, mainly, for the industrial economy and the mining sector. Humanities, socioeconomic, pedagogical specializations look much smaller. Moreover, the region sees a serious manpower shortage in humanities and natural science. According to statistics, only state-owned tertiary education institutions were operating in the Kemerovo region in 2018.

Let us designate some indicators that characterize the region's education system in assessments comparative with the average indicators for the Russian Federation and show its position among other regions (Bondarenko et al., 2017). The Kemerovo region has an indicator of coverage by the population aged 17-25 years of places for studying at higher education institutions at the level of 24.7 %, which is significantly lower than the all-Russian indicator of 33 %. The region is one of the most problematic constituent entities of the Russian Federation, where the coverage level is below 28 %.

As an indicator characterizing the quality of education in the region, the proportion of students in higher education institutions of the region enrolled in the first year with an average exam score of at least 70 is used. The indicator of the quality of education in the region is 9.8 % compared to the national average of 24 % (Monitoring the quality, 2018). The region occupies the 48th place out of 79 regions by the quality of state-funded programs. That is, by the main characteristics of the accessibility of higher education, the region over the surveyed period displays very modest results among other constituent entities of the Russian Federation, taking 26th place (Monitoring the quality, 2018).

Most of the respondents at the region's tertiary education institutions are state-funded. The share of the "self-funded" student amounts to 26.8 % of respondents, which is almost twice as different as the average for Russia (Figure 1) (Report of the Government, 2018). This is confirmed by official figures for the Kemerovo Region (Report on the analysis..., 2017).

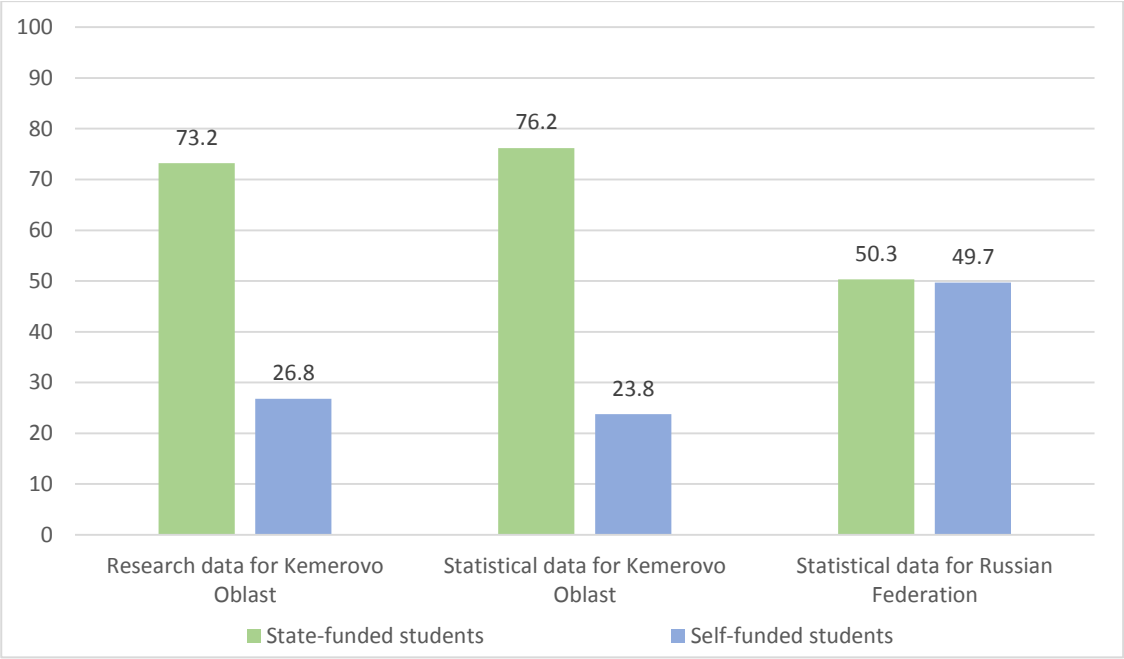

Fig. 1. Distribution of answers of the Kemerovo Region's students about the ways of educational reimbursement (in % of the number of respondents) and the Russian Federation's students (statistical data for the Russian Federation)

One of the most important indicator in the formation of student's educational trajectories is the human (social) capital of their immediate social environment, that is, the family (Guan, James, 2019, Stensaker et al., 2019; Jin, Ball, 2019). The education and social status of parents are the most significant parameters in this analysis. Higher education institutions are entered by young people whose parents have a fairly high level of education (more than 75 % of fathers and about 85 % of mothers have higher or secondary vocational education). Moreover, the educational level of mothers is higher than that of fathers (Figure 2).

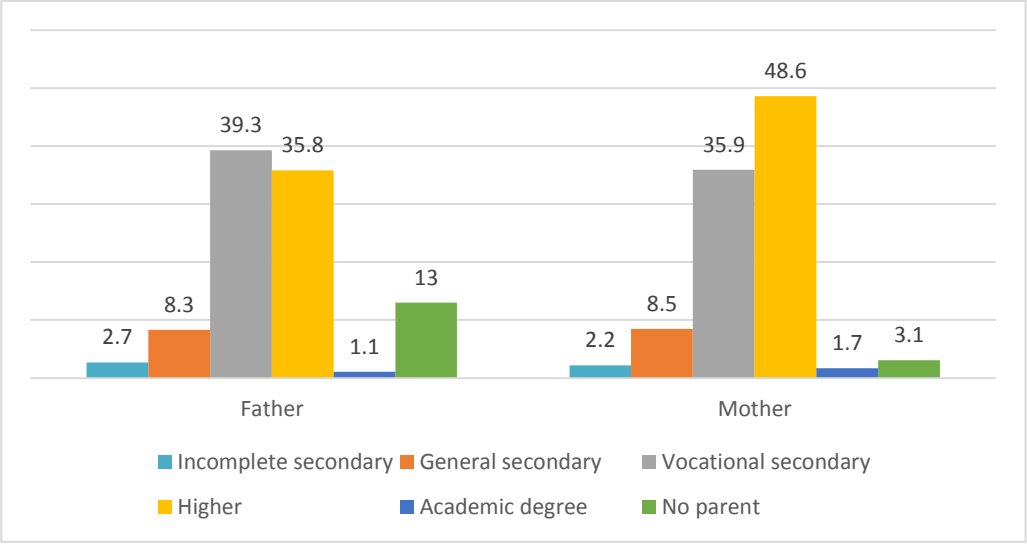

Fig. 2. Distribution of responses from students of higher vocational schools on the level of education of parents or persons replacing them (stepfather, stepmother, adoptive parent), in % of the number of respondents

(χ^2 (5) = 117,653; p<0,001).

The distribution of parents by social status in terms of employment shows that most often they are employees and specialists having higher education. About 15 % of parents occupy management positions. By gender, fathers are represented slightly more compared to mothers among those who have their own business (7.5 % vs. 4.1% for mothers), as well among those who are industrial workers (13.7 % vs. 10.6% for mothers)(χ^2 (9) = 227,842; p < 0,001).

During the study, students were asked about their living conditions. 34.4 % of respondents live with parents and relatives. 36.1 % of respondents live in a dormitory. 17 % of respondents rent their housing, and 12.6 % have their own. Since the survey involved the region's all major higher education institutions, which are located in the cities of Kemerovo and Novokuznetsk, students coming from villages and small towns of the region can be assumed to make up the main group of students there. Due to these cities' central status in the region, graduates of the secondary schools located there are, on average, better educated. It can be concluded that those who leave the region for educational reasons represent the most educated and, consequently, most ambitious part of prospective undergraduate students.

Migrants from other regions account for only 4.3 % of the students surveyed, which reflects poor demand for the Kemerovo Region's higher education institutions on the part of school graduates from the neighboring regions. It should be noted that the neighboring regions, i.e. Tomsk and Novosibirsk Regions, and also the Krasnoyarsk Territory, have well established higher education sectors seriously competing with the region under study. They significantly divert secondary school graduates not only from the Kemerovo Region, but also from other constituent entities within the Siberian Federal District and neighboring territories.

Higher education students were distributed by educational trajectories in accordance with the aiming of the region's education system to prepare specialists for the industrial sector of the economy. Most of them represent the engineering sector (25.5 %) and also finance and economics (20.6 %). The medical, social and humanitarian directions make up a significantly lower proportion. The share of teachers and those mastering natural sciences and information technologies is small.

Starting positions when entering the current level of education represent important indicators characterizing the purposefulness and awareness of choosing educational trajectory. Most of the respondents became higher education students after finishing secondary school (88 %). Some students continued their studies at a higher school after graduating from a vocational school, that is, they came from the secondary vocational education system (8.2 %). A small number of respondents indicated that they had entered this higher school after studying at another higher education institution (3.1 %).

When motivating their choice to continue their studies at a higher education institution, most students noted that they were oriented towards the profession (74 %). Following their dream to study in this particular educational institution, were 23.8 % of higher education students. 17.5 % noted that they had made their choice under the influence of their parents. Such a motivation as a continuation of family traditions was only noted by a small part of the students (6.7 %).

However, an analysis of the respondents' answers to the question of whether a person's success in life depends on the education level shows that practically equal proportions of respondents either do not link success to education (44.5 %) or consider higher education an important factor in achieving this success (44.8 %). All other answer options did not actually go beyond the statistical error.

The main motive for choosing a specialty by the students is an opportunity to have an "interesting and varied job" (40.8 %). Of high significance are also such motives as "career opportunities" (23.8 %) and "confidence in stability and guaranteed employment" which the students associate with their specialty (20.4 %). Job popularity and prestige is significant for every fifth respondent. An opportunity to set up their own business and apply the expertise gained through education attracts 14.3 % of students. Among the students surveyed, there is a rather high proportion of those who indicated the possibility to gain employment abroad after specialty training as a motive for their choice (19.4 %). 18.8 % of the respondents were guided by the easiness of getting subsequent employment.

Interestingly, a significant proportion of higher education students (23.4 %) frankly admitted the randomness of their choice of specialty. 19 % took the advice from their friends, relatives and acquaintances. One in ten respondents explained their choice by the easiness of studying at the chosen faculty. The total weight of responses that directly or indirectly indicate accidental, unconscious choice of future profession is about 40 %!

In fact, this is the share of "random" people at a higher education institution who are unlikely to work in their field and build their career in the chosen direction. Since students at the Kemerovo Region's higher education institutions are mainly state-funded, such a high proportion of unmotivated students is indicative of problems in career guidance in the region and the selection system for post-secondary schools in general.

When choosing a course of study, students traditionally focus primarily on a particular profession, being unaware of the labor market currently undergoing a deep and dynamic transformation. In many ways, school leavers, parents, and higher school students turn out disoriented (Flores et al., 2020; Macfarlane, 2020; Tomlinson, Jackson, 2019). Therefore, it is very important to quickly change 20th century's "career guidance" approaches and concentrate on personal and career counseling, attracting experts in recruiting and staff development. In this regard, modern group-work technologies, such as hackathons, start-up festivals, in-depth internships at business enterprises, solving specific production problems, can become extremely useful (Webb et al., 2017). A recent example of such new approaches is the holding of one of the stages of the "Open Innovation" startup tour in Kemerovo. This event is very important, but still not enough. Further analysis of the respondents' answers confirms these findings.

Among motivation factors when choosing a particular college or university, students noted that they were guided by the following: university reputation (38.4 %), availability to explore majors that reflect their personal interests (28.6 %) and good partnerships a university has with employers (15.8 %). However, a rather significant share confirmed the randomness of their choice, that is, they were guided by the advice from their social environment (29 %), close proximity to their homes (30 %) and easy admission (20.4 %). An intermediate position is occupied by those who were able to enter only this particular higher education institution, because they failed to enter the others (17.3 %). One out of ten respondents indicated that in fact "there was no choice", since it was the only way to get an education without moving away from their hometown (11.7 %). This once again proves underdevelopment of the network of higher education institutions in the region.

Assessment of the quality of education and satisfaction with the education process on the part of students is a very subjective indicator, the analysis of which depends on the students' motivation to study, on their personal attitudes and desire to improve themselves in the chosen field (Le et al., 2020; Ryan, Lőrinc, 2018; Research "Value orientations…", 2017).

Students evaluate very highly the educational programs in their course syllabus and curriculum. Satisfaction with their topicality and relevance was expressed by 80 % of respondents. The students displayed most satisfaction (over 50 %) by the following indicators: qualification of the teachers lecturing the theoretical part of the program; conditions for the preparation of publications, participation in conferences, scientific work, the use of information technologies, and the study of foreign languages. Below others (28.2 %) are evaluated the orientation of the educational process toward preparing one for real working conditions and entering the labor market. It is understandable, since not all students can fully assess this form of work, because they have not yet thought about their employment or continuing their careers in their chosen specialty.

Technologies that students master at their educational institutions were estimated as "fairly modern" by more than half of the respondents (51.8 %) and as "modern technologies used by industry-leading companies", by another 8.8 %. At the same time, every fifth higher education student thinks that they study outdated technologies. 17.5 % of respondents failed to give an answer to this question and to substantively evaluate the learning technologies.

In general, it can be noted that the students' assessments of the technological effectiveness of studying at the Kemerovo Region's higher education institutions are in many ways in accord with the opinions of the heads of those institutions' structural divisions. The higher education system is slowly mastering new technologies incorporating them into students' education. That is to say, the region's educational institutions do not appear as locomotives in terms of new technologies, but are rather "catching up". This conclusion is also confirmed by experts who argue that "in the region's education system there is a lot of sluggishness, and those graduated from today's higher

education institutions may not be needed tomorrow." This is a serious problem urging one to improve education in the region and bring it into compliance with the employers' demands and those of the labor market as a whole.

The students evaluated diversely the knowledge gained through the education process from the viewpoint of student employability. A quarter of the students consider it to be sufficient (25.9 %), a third of them are not sure in one way or another of their education (35.3 %). The share of the respondents answered that the knowledge was insufficient is 16.3 %.

The majority of students expect their specialty knowledge (71.5 %) and practical skills (53.3 %) obtained in educational institutions to be useful in their future work. They value the acquired communication skills relating to the "flexible" skills (51.9 %). Their usefulness was only noted by every third respondent (31.2 %). Significant is their assessment of the importance of knowing foreign languages (27 %), and using a computer (28.7 %).

When asked whether they confirmed the choice of the educational trajectory, more than one-third of the students surveyed indicated their readiness to repeat the choice they had made (32.4 %). 11.8 % of the students would change their specialty or department. That is, about 44.2 % of higher education students believe that they have correctly chosen the educational institution in which they receive higher education. At the same time, the proportion of those who had confirmed the choice of a specialty but would like to get it in another educational institution is quite significant. This answer was given by 14.5 % of respondents. Of those willing to change something in their choice, 44.2 % said they would change their specialty within their educational institution.

Success in the education process can be considered in the context of the current employment of students. One third of the students (36.8 %) are currently employed, most of them working in an unrelated field. Most often, students work for extra money, 68 % of the number of those working, respectively. However, there are those working with the purpose of gaining experience for subsequent employment, every fifth. Working for the sake of mastering the chosen specialty is every tenth employed student.

An important component of a contemporary education process is the students' desire and ability to independently acquire new knowledge and master skills that are not included in their curricula. More than half of them said they were engaged in self-education and read professional magazines, books, etc. (54.2 %). They are also active in attending additional courses and seminars (32.7 %). Online education is in demand among 40.9 % of respondents.

As to the practicums, they, on the whole, occur regularly and systematically. Students replied that they had repeatedly attended practical training in their specialty (69.4 %), while 16.2 % had attended only one practicum during their studies. 14.4 % had never attended practicums.

Using Pearson's $\chi 2$ test, a statistically significant difference in the practical training by profession was revealed (χ^2 (20) = 278,648; p < 0,001) (Table 1).

Table 1. Question: In what field of study does your major go into?

Fields of study	Practical training			**Total**
	Every year	Only once	Never	
Medicine	92.6	5.6	1.9	**100**
Culture, Arts, Sport	83.0	8.0	9.0	**100**
Agriculture	81.8	12.1	6.1	**100**
Engineering	77.3	17.6	5.1	**100**
Natural Sciences	65.4	22.2	12.3	**100**
Economics, Finance, Management	64.0	18.2	17.8	**100**
Pedagogics	61.9	15.9	22.1	**100**
Information Technology	50.0	35.7	14.3	**100**
Humanities & Social Sciences	34.9	17.8	47.4	**100**
Defense and Law	33.3	0.0	66.7	**100**
Other	69,2	7,7	23,1	**100**

Thus, regular practicum attendance was reported by students majoring in medicine, agriculture and engineering, and also in culture, art, and sport. While on the contrary, two thirds of

the defense and law students and a half of the students majoring in humanities and social sciences had not attended practicums for the whole period of their studies (66.7 и 47.4 %, accordingly). A significant proportion of those who are not involved in practicums can be noticed among students majoring in economics, finance, and natural sciences. It is telling to note that every fifth student majoring in pedagogics did not attend practicums. The lack of practicums while studying, especially in pedagogics, displays limitations in the teaching process and inevitably affects the quality of higher education.

The percentages of those who know about the possibility of doing internships provided by their educational institution, and those who found it difficult to answer this question are almost equal. 17.9 % of students claimed that in their higher education institutions there was no possibility for internships. About half of those students who were familiar with the internship program in their educational organization did an internship. Students majoring in medicine, information technology and engineering are actively invited to do internships. Students majoring in social sciences, humanities and pedagogics are least involved in the internship system. The indicated differentiation was revealed by using Pearson's $\chi 2$ test and is statistically significant ($p = 0{,}001$).

When answering the question about their personal achievements in the education process, more than 60 % of students mentioned, first of all, getting excellent and good marks. More than a quarter (27.7 %) of students participated in the scientific conferences and prepared publications in their field. 17.8 % consider individual creative projects to be their personal achievements.

The distribution of students' answers about personal achievements during the education process in their fields shows that agriculture students are most proud to be hired by a well-known company. Publication activity is most pronounced among students majoring in culture, sports, natural sciences, finance and economics. Individual creative projects are most actively developed by students majoring in culture, art, sport, and also agriculture and pedagogy.

An overall analysis of respondents' answers regarding personal educational achievements shows the latter to be very modest. During their studies, students actually did not succeed in learning foreign languages, did not try themselves in the profession at the workplace; they participated very poorly in project activities; they did no internships and failed to establish ties with employers. Thus, graduating students of higher education institutions have personal achievements similar to those of school graduates, that is, scoring “good and excellent marks”.

All their achievements can be assumed to be lying in the field of theoretical training and, accordingly, they are sure to encounter problems when entering into a profession. In order to bridge such a gap between theory and practice, one can propose strengthening the students’ stimulation and motivation to take more active steps in the applied component of their education, among other things, developing their own projects and solutions and participating in professional skills competitions.

The students’ prospective professional and educational plans for completing the current educational stage seem to be a significant indicator in terms of their more informed and balanced choice. Those students can be conditionally divided into four groups: those going to continue their study to master’s degree, those wishing to start working, those eager to get a second higher education, and those who “do not have clear plans yet”. 38.7 % of the respondents are planning to continue their study at the stage of post-graduate education (the master’s program). Every fourth graduating student (25.3 %) will go to work in their specialty. 7.1 % of the respondents will try to work in an unrelated field. 3.9 % of the respondents will receive a second higher education in another specialty. 14.9 % of the respondents did not have clear plans at the time of the survey.

Since the study sample includes undergraduate students earning a Bachelor’s degree, a refusal to continue further studies on the part of 60 % of the respondents is a very alarming indicator. Today’s trends in higher education show the trend towards receiving a complete education through two stages, Bachelor’s and Master’s programs to be increasingly in demand and is implemented by a significant number of students. According to statistics for the period from 2006 to 2017, the demand for a master’s degree increased from 6 % to 50 % (Research “Value orientations…”, 2017).

The share of those who are focused on continuing their studies and obtain a master’s degree is higher among students studying on a government-funded basis (42.2 % vs. 29.2 % of those who pay tuition fees). Naturally, they intend to start labor activity less often (36.6 % vs. 39.8 %, respectively, for the indicated categories of respondents) (χ^2 (5) = 25.150; p = 0.001) (Table 2).

Table 2. Question: What do You plan to do after graduation?

Answer options	Forms of education	
	Government-funded basis	Paying tuition
Continue studies and obtain master's degree	42.2	29.2
Start working	36.6	39.8
Get a second higher education	3.4	5.1
Join the army	3.2	5.1
Dedicate oneself to family	1.2	1.8
Don't know	13.5	19.0
Total	**100.0**	**100.0**

Students who have decided to continue their studies are currently majoring in engineering, medicine, economics, finance and management, social sciences and humanities. Among students majoring in other fields, the percentage of respondents who intend to continue studying does not go beyond 10 %. This is especially telling, in particular, for pedagogics or natural sciences. Today's labor market urges a higher level of education than undergraduate studies, exactly for the above fields. Accordingly, a refusal to continue education automatically entails leaving the profession and getting a job in an unrelated field.

A choice of a field of study at the next stage of education, a Master's degree, is more informed and balanced than when getting into a bachelor's degree program. Answers of higher education students about possible options for continuing studies show half of them effectively focusing on their region of residence (56 %). It can be noted that the higher education system in the region is self-replicating, which is confirmed by the answers of the heads of higher education institutions' divisions, 73.2 % of them having indicated that they work at the higher education institution they have graduated from.

Almost one in ten respondents intends to leave hometown to study at higher education institutions in neighboring regions within the Siberian Federal District. 11.8 % of respondents will be trying to enter higher education institutions in Moscow and St. Petersburg. There is a high proportion of those who found it difficult or would not give an answer (13 %). Most likely, they include those who have migration plans, but are not sure of their capabilities. Thus, 31-44 % of the students who are determined to continue their studies after graduating do not consider continuing education at the Kemerovo Region's higher education institutions. These data have a high correlation with those of studies conducted across Russia and its individual constituent entities (Roshchin, 2018).

As part of analytical statistics procedures, a multidimensional regression analysis was performed with a step-by-step input of a set of independent variables that can have a significant impact on students' plans after graduation. The calculation of the regression equation revealed a statistically significant effect of such factors as the assessment of the modern technologies studied in a higher school, financial support for training of the students, their previous educational trajectory and evaluation of the adequacy of acquired knowledge (significance of the model at $p < 0.001$, coefficient of determination $R2 = 0{,}600$).

Thus, the share of those oriented toward continuing studies in the Master's program is growing significantly among those who believe that the technologies mastered in their university are modern, used by leading enterprises in the industry (49.6 %), and are declining among those who believe that they are being taught outdated technology (35.0 %).

A similar differentiation of plans is presented in the assessment of the sufficiency of the gained knowledge opening up the prospect of sought-after professionals for the graduates, 45.1 % of those students who believe that the knowledge gained will be enough for a contemporary specialist, and 32.1 % of those who are sure of the opposite will intend to continue their education.

The effect of the influence of the source of financing of training in this regard is reflected in the fact that those who study on a government-funded basis more often make plans to continue their education, while students studying on a self-funded basis are more likely to start working.

The influence of the educational trajectory on the future plans of graduates expresses a natural pattern: the longer the student's previous educational history, the clearer their plans to begin independent work, and therefore those who entered the university immediately after school are more focused on continuing education.

Higher education students who consider moving to other regions of the Russian Federation to continue their studies (28.1 %) substantiate their position, first of all, by a desire to have better living conditions (57.3 %) and get a higher quality education (55.4 %). Of significant importance to them is also the place of the chosen higher education institution in the ranking (43.3 %) and its prestige (38.2 %). Without fear or favor, the Kemerovo Region's higher education institutions are still losing by these parameters to those of neighboring regions (Tomsk Regions, Novosibirsk Region and Krasnoyarsk Territory). Also important for the respondents is a possibility of foreign internships (29.3 %), building a scientific career (26.1 %), established contacts with employers (25.5 %) and a pronounced practical component in the education process (20.4 %). A quarter of the respondents indicated a lack of their chosen specialty in the higher education institutions in Kuzbass as the main motive. Thus, all other things being equal, some of these students could be attracted to higher education institutions in their home region. On the whole, the students' answers to this question show their informed choice and the understanding of the prospects for their further educational trajectory.

Few people (3 %) were revealed during the survey who wish to continue their studies in another country. Therefore, it seems incorrect to fully analyze their motivation, but it is possible to consider their main arguments. These students noted that they were guided by the desire to change their place of residence, improve their foreign language skills, and also get a better education and implement their career ambitions. Similar answers were revealed in other studies. According to the Higher School of Economics survey, the main motivations for students to study abroad include the desire to strengthen their foreign language skills, improve their qualifications, education, etc. (Research "Value orientations...", 2017).

According to expert interviews and mass polls, the problem of retaining the best graduates worries both the region's government and its residents. However, despite the efforts being made, the situation is not radically changing. The very formulation of the problem, and, accordingly, the task of "retaining" youth seem to be unconstructive and essentially false. If this problem is reformulated as "attracting the most promising students to the Kemerovo Region's higher education institutions", its solution will become possible and feasible.

Students who have decided to go to work immediately after graduation are confident that they will be able to find a job in their field in their region (79.8 %) and in neighboring areas (67.7 %). 56.2 % are sure that they will be in demand in other regions of the country, and 43.3 % are ready to compete in the labor market in Moscow and St. Petersburg. One-third of the respondents (32.5 %) believe they will be able to find a job abroad.

As little as 7 % of the respondents answered that they were going to work in an unrelated field. It is significant that they evaluate similarly the prospects of their employment in various regions of the Russian Federation, and all the answers have a frequency of over 60 %. The respondents are slightly less optimistic about working abroad. Obviously, there is a certain difference between the plans and the way things actually unfold. Official figures show that at present every sixth graduate student cannot find a job during the first 7 months after graduation.

The respondents' answers regarding their plans after completing their bachelor's degree show that the region's educational potential is materialized rather poorly. Surely, the students' migratory feelings are largely conditioned by the general socio-economic situation in the region. However, modernizing the region's education system, improving the prestige of its higher education and research institutions, and implementing promising educational projects can significantly restrain youth migration from the region both for continuing education and for employment.

Since all graduates, in any case, will have to find a job, they were asked about possible options of searching for a job. The most popular options here turned out to be "going to job search websites, and also to individual companies' websites and social networks to send out their resumes there" (62.8 %). A rather significant proportion of the students rely on their higher education

institution's well-established contacts, including organizations where they have done practical training or internships (43.6 %). About one-third of the respondents (33.6 %) are ready to take initiative and interact directly with employers. 30.9 % of those polled are hoping for help from their social environment (family, relatives, friends or acquaintances).

The proportion of those who would like to start their own business among the students surveyed is insignificant (5.1 %). They doubt their ability to organize their own business, but in doing so they mention not so much their own inability as external obstacles (bureaucracy, corruption and crime).

The introduction into professional education of such relatively new tools as professional skills contests in the WorldSkills format, demonstration exams, specialized academic competitions and other initiatives can also be regarded as an additional incentive for personal growth in the chosen specialty.

Students participating in the survey noted that they were rather poorly informed about the WorldSkills program. As little as 17.4 % indicated that they were aware of it. Although this program is primarily focused on secondary vocational education, such low awareness indicates an almost complete lack of interest in this topic. Those familiar with WorldSkills evaluate the program, on the whole, positively. They mention, first of all, its usefulness from the viewpoint of both one's future professional career and improving professional skills.

To obtain an integral indicator of the quality of life, the respondents were asked to assess the situation in the region by a number of key indicators. Factor analysis was used for qualitative convolution and generalization of the obtained estimates. Within the framework of this procedure by the Principal Component Analysis method according to the Kaiser criterion, 3 factors were extracted from the set of considered indicators, followed by orthogonal rotation according to the Varimax method (Table 3 and 4).

Table 3. Total Variance Explained

Component	Initial Eigen values			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5,166	36,897	36,897	3,092	22,085	22,085
2	2,308	16,483	53,381	2,997	21,409	43,494
3	1,112	7,945	**61,326**	2,496	17,832	61,326
4	,803	5,734	67,060			
5	,743	5,309	72,369			
6	,605	4,319	76,688			
7	,589	4,207	80,895			
8	,496	3,546	84,441			
9	,481	3,438	87,879			
10	,438	3,129	91,009			
11	,407	2,904	93,913			
12	,340	2,432	96,344			
13	,279	1,996	98,340			
14	,232	1,660	100,000			

Extraction Method: Principal Component Analysis.

Table 4. Rotated Component Matrix[a]

	Component		
	1	2	3
6 Health care quality	,815	,177	
5 Quality of housing and communal services	,768	,148	
7 Personal security level	,704	,210	-,206
8 The level of social aid to young people from local authorities	,630	,407	
9 Opportunities for running business	,608	,376	
14 General standard of living	,534	,491	-,154
12 Cultural events	,167	,839	
13 Opportunities for leisure activities of the youth	,244	,812	
11 Quality of higher education	,268	,731	-,108
10 Quality of general education	,346	,658	
3 Spread of drug addiction			,872
4 Spread of alcoholism		-,110	,822
2 Youth crime rate			,812
1 Youth unemployment rate			,554

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 4 iterations.

Hence, the resulting model explains in total 61.326 % of the total variance. A comprehensive analysis allowed us to offer the following informal interpretation of the identified factors of the quality of life in the region:

Factor 1: Social and economic situation in the region (health care system + quality of housing and communal services + security + social aid to young people from local authorities +opportunities for running business + general living standard);

Factor 2: The degree of development of the leisure and educational infrastructure for young people;

Factor 3: Negative phenomena in the region's society (drug addiction + alcoholism + crime + youth unemployment).

The results of factor analysis may allow studying at a higher level of generalization the value attitudes and motivations of the youth to participate in the economic, social and cultural life of the region.

5. Conclusion

The study revealed the opinions of higher education students in Kemerovo Region about the quality of education they receive, about the problems in the formation of professional skills and competencies faced during the study, the possibility of implementing individual educational trajectories, their migratory feelings and career plans. The motives and arguments determining their choices of higher education institutions and academic fields were studied, and factors influencing such choices were defined.

The results of the study enable one to conclude that today the most trained and, consequently, more ambitious potential college and university students are leaving the Kemerovo Region. At the same time, the share of migrants from other regions accounts for only 4.3 % of the surveyed students. On the whole, this situation is indicative of the region's higher education institutions being in low demand among secondary school graduates. It is telling, however, that a significant proportion of higher education students (23.4 %) openly admit the randomness of their choice of specialty. The total weight of the answers, pointing (directly or indirectly) at the random or unconscious character of the choice of the future specialty (profession), is about 40 %! In fact, this is the proportion of "random" people at a college or university who are unlikely to work in their specialty or build their career in the chosen field. Since students studying at the Kemerovo Region's higher education institutions are mainly government-funded, such a high proportion of

unmotivated students indicate some problems in career guidance in the region and higher education student recruitment in general.

Respondent judgments about their plans after completing their bachelor's degree show that the region's educational potential is unlocked rather poorly. Certainly, students' migration plans are largely conditioned by the general socio-economic situation in the region. However, modernization of the region's education system, raising the prestige of its higher education institutions and scientific research centers, and the implementation of up-and-coming education areas can have a significant "braking" effect on young people's out-migration both for continuing education and for work.

Nearly every tenth student is planning to travel to the neighboring regions within the Siberian Federal District to continue their education at higher education institutions. 11.8 % of the respondents will try to enter such in Moscow and St. Petersburg. 7.2 % are planning to leave for the regions in Russia's other federal districts, while 3 % for another country. Higher education students who admit the possibility of travelling to other regions of the Russian Federation to continue their studies (28.1 %) substantiate their position primarily by the desire to have better living conditions (57.3 %) and get a higher quality education (55.4 %). As part of the factor analysis, the main factors of the quality of life in the region were identified, which allowed, at a higher level of generalization, to study educational strategies dominating in the youth social environment, their value attitudes and motivations to participate in the socio-cultural dynamics of the region.

Higher education students assessed in different ways the knowledge gained during their study in terms of a demand for them in the labor market. Only a quarter (25.9 %) of them consider it sufficient, while a third (35.3 %) are in one way or another not sure of their educational standards.

The distribution of students' answers to the question about doing their practicum revealed, in general, its regular and systemic nature. Thus, 69.4 % of students noted that they had repeatedly had practicums in their specialty area, and 16.2 % had only had it once during their studies. 14.4 % have never had an internship. At the same time, a statistically significant difference was revealed in doing practicums in specialties. It is telling that every fifth student (22.1 %) majoring in pedagogics never participated in practicums. The lack of practicums in higher education, especially in pedagogical specialties, is clearly indicative of the insufficient preparation of higher education students and inevitably affects the quality of education.

On the whole, the results of the study enable one to propose a set of measures aimed at modernizing the regional higher education system, including the use of targeted education opportunities, the organization of interaction with the region's businesses enterprises, the network interaction of higher education institutions, the potential of WorldSkills contests, as well as implementing new educational approaches, forms and methods, doing practicums and internships. All this should contribute to increasing attractiveness of regional higher education institutions, the formation of a balanced labor market and rising socioeconomic indicators in the country as a whole.

The results of the study will be of use to everyone who takes an interest in the country's education modernization issues, sociologists, and migration and job market experts, as well as the Russian Federation's regional education officers. The research tools can be used as a basic model when analyzing the education system in Russia's regions to identify the most problematic points in the organization of work at all levels of the education system.

6. Acknowledgements

We would like to thank the Russian Foundation for Basic Research (RFBR) for supporting our survey (Grant No. 19-014-00001). We also express our sincere appreciation to the anonymous reviewers for their interest in our work and for their contribution to the quality of this paper.

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