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PROFESSIONAL CULTURE OF YOUNG SPECIALISTS CONSISTENT WITH INNOVATIVE DEVELOPMENT OF THE REGION

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Abstract

During socio-economic changes, which take place in Russia, the role of regions in the socio-political and innovative development of the country is increasing. Employees need high educational and scientific potential for successful professional activities. The authors analyzed the professional culture of future specialists for an innovative economy in such areas as educational, research and publication processes, scientific activity, life plans, work experience using the example of undergraduates in technical and natural sciences at the Ural Federal University (n = 315). The authors conducted a survey of undergraduates in 7 thematic blocks containing 29 questions, including tabular questions, which amounted to 53 source variables. This made it possible to calculate the conditional average and sort by the index (for example, the index of satisfaction with various components of training), and use this data for calculations. The analysis made it possible to highlight and identify four groups of future specialists: “high-resourced”, “deprived”, “scientists” and “outsiders”. The conclusion was made that two groups of undergraduates are promising, these are “scientists” and “high-resourced”, whose representatives, as a rule, have good results both in academic work and in research activities. In the modern innovative economy, representatives of these groups respond to rapidly changing economic conditions and can actively participate in creating a new socio-economic space in the region.

Keywords: Innovative development, professional culture, region, university, young specialists.

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1. Introduction

Globalization changes in the economic space make it necessary to review theories of innovative development. In the modern conditions of new industrialization, innovation is an important factor for the development of the economy both at the macro level and at the meso level - in the region. It is obvious that universities, as active participants in the regional space, should expand the field of their activities and the scope of their influence on the economy of the region. The model “university-education” is no longer relevant. The traditional ways of development of regional economies, based mainly on extensive growth, have already exhausted themselves, and breakthrough strategies of development associated with the economy of innovation come to the fore. In the era of globalization, the factor of innovative development becomes especially important.

The creation and implementation of an innovative model in the territory requires the interaction of various stakeholders, such as business, the regional community, universities, public organizations, and government structures. In order to solve the problem of innovative development of the territory, various resources are needed, one of them is the staff potential. This leads to the fact that the role of universities in socio-economic development is changing. Universities are now faced with the task of forming the personnel potential of the region.

In the framework of the interaction of various participants in the regional space, an innovative regional structure is being formed - a cluster that demands new professional requirements for young professionals. The new task of the university is to form young people with new professional competencies and professional culture that meet the requirements of an innovative economy. The concept of "professional culture" is today one of the most important socio-cultural factors in the creation of a highly qualified specialist.

2. Problem Statement

Nowadays all the necessary prerequisites have been developed for solving problems in the field of professional culture of specialists in the innovative economy. This is due to the fact that human capital, capitalized in innovative products, is becoming one of the main factors in the growth of the national economy. Russia, being in the process of strengthening its international position, which is associated with the complexity of the country's economic and political conditions, puts forward high demands on the choice of approaches to the formation and assessment of human capital. The state educational policy today, responding to the challenges of an innovative economy, is more focused on creating new professional competencies among specialists for a modernizing economy and industry (Timofeev et al., 2019, p. 218).

Innovative processes in the economy are impossible without new innovative staff, since a necessary condition for the transition to a new economy is a large number of highly qualified specialists who will provide all the processes of innovative activity. They are the specialists of the new professional culture who are responsible for ensuring all innovation activity through applied and scientific research, their widespread introduction into production (Nikulina, 2014, p. 165).

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Traditionally, young specialists were given great attention in the workplace, measures were developed for their adaptation, fixing at the workplace. Diploma guaranteed a certain niche in the labor market. But now despite its existence in a "certified society", a university graduate diploma does not guarantee successful employment and further work. Working conditions are undergoing major changes, which puts forward higher demands on graduates of the modern system of higher professional education, their competencies and the needs of the innovative economy (Migacheva, 2007, p. 95).

Of course, for any educational organization that implements training in higher education programs, it is necessary to create the right educational environment. Currently, there are many different descriptions of the types of educational environment. Yasvin (2001) identifies various structural components, as a combination of external and internal conditions, acts as a source of upbringing and personality development (p. 14). At the same time, the influence of the educational environment of the university on the development of students must be carried out in the context of modern labor market requirements for young professionals. Zaitseva et al. (2019) came to the conclusion that the role of universities in the development of the regional economy should be considered more widely, this would solve the existing problems of its innovative development. The university implements the educational policy of the state, and also is being a link between various participants in the innovative economy in the region: regional authorities, employers, representatives of the public, science, professional communities.

Many researchers, while working on various aspects of the interaction of the professional culture of young specialists and the innovative development of regions, notice the great role of the development of innovative qualities in the formation of professional socialization of young scientists (Hunagov, 2010); explore the content of the concept of "professional culture of a scientist" (Erohin & Erohin, 2011); describe the essence and social approaches of innovation in education (Gerasimov et al., 1999); analyze the relationship between knowledge creation, innovative activity and increasing regional and national competitiveness based on "smart specialization" (Carayannis & Campbell, 2009); note the need for specialists to meet the requirements of the labor market and the innovative economy (Ashmarina & Izmajlov, 2018; Kisin & Obukhova, 2017; Shkil et al., 2016); justify the need to accelerate the adaptation of regional educational and research institutions to changing market conditions (Gurnovich et al., 2020) and the active interaction of the teaching staff and students with engineering centers created at universities as points of effective application, development and commercialization of new technologies (Privalov et al., 2019). Boris et al. (2019) believe that creative human resources are a prerequisite for the functioning of innovative industrial companies, their strategic resource and production factor, and investment in it should be active in the era of innovation. Florida (2006) considers creativity as the most important economic factor due to which a new social creative class arises, which dominates in terms of welfare and income, since its representatives earn on average 2 times more than representatives of other classes.

Let's look at the analysis of the concept of "professional culture of a specialist". In itself, a professional culture is a combination of several types of cultures, among which: ethical, aesthetic, methodological, design, legal, environmental, professional psychological culture (Vinogradov & Sinyuk, 2000). However, along with the above components of professional culture in the conditions of innovative development of territories and production, there is a requirement for other components, such as a focus on

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research and scientific activity, i.e. research culture of future specialists, which needs self-organization and self-management and attitudes to realize their creative potential. In this research, while studying the professional culture of a specialist, we consciously don't use the competency-based approach and the competency-based model of a competitive specialist. Although this approach is actualized by various authors (Elagina et al., 2008; Kelchevskaya, & Shirinkina, 2016). It is also because, in the framework of the implementation of educational services, we form the core of competencies for the graduate, which are different, these are general cultural competencies, general professional competences dictated by the Federal State Educational Standard and professional competencies, every student can form a set of them independently. Regarding to competencies, the main problem in our opinion is that competency is normative by itself, it has gone through institutional development and consolidation, and therefore, while it has been embodied in a competitive university graduate, it has lost its relevance in an innovative economy.

It is necessary to study the professional culture of young specialists in the framework of the acmeological approach. The efficiency of the implementation of this approach in the training of future specialists for an innovative economy seems more promising to us. The role of the university is surely important: its staff potential, corporate culture, technical and scientific base (Zapariy et al., 2018). However, the main problem of universities today is the low performance and delayed response to changes in the economy. Therefore, in the modern system of higher education, not ideally created forms and means of instruction come to the fore, but questions of students' desire for self-realization, self-education and self-improvement, their ability to integrate not only into the educational, but also into the research and production processes (Kozlova & Berestneva, 2006). The acmeological concept makes it possible to understand how, in relatively equal conditions, representatives of one homogeneous group or cohort demonstrate different research results and have different degrees of compliance with labor market requirements. In the framework of the acmeological approach, considering the future specialist in the system of higher education as a social phenomenon, it is possible to describe its development through self-improvement, self-control, self-education. Self-reorganization processes are taking into account not only their system of values and attitudes, but also external factors, in our case, they are new requirements of the innovative economy, labor market and professions (Begidova, 2012).

3. Research Questions

The goals and main directions of modernization and innovative development of the economy are defined in Decree of the President of the Russian Federation dated May 7, 2018 No. 204 "On National Goals and Strategic Tasks of the Development of the Russian Federation for the Period until 2024". One of the strategic tasks of the development of the Russian Federation is to accelerate technological development, increase the number of organizations implementing technological innovations. To achieve this goal, the state sets before Russian universities the task of training specialists who possess not only professional knowledge and skills, but also have scientific potential, the presence of which allows us to overcome prevailing stereotypes, develop innovative ideas, and efficiently and in a new way solve current problems of their city, region, country. In the conditions of the modern labor market, the requirements for an employee increase significantly. In the conditions of a rapidly changing economic situation, for a

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successful professional activity, in addition to professional knowledge and competencies, it is necessary to have certain personality qualities, such as independence, responsibility, teamwork, creative activity, the ability to update knowledge, that is, such personality qualities, which provide him with competitiveness in the labor market (Didkovskaya, 2018). Today, universities are faced with the task of developing methods and mechanisms conducive to the formation of all elements of a professional culture with a specialist.

Analysis of the results of the activities of university graduate students in such areas as educational, research and publication processes, according to the degree of differentiation of their personal qualities, scientific and professional activity, allowed us to distinguish four groups of future specialists. The hypothesis of the study is that undergraduates with the main motives for implementing it in the profession of education received (professional stability), demonstrating good results both in academic work and in research activities, are the basis for the formation of the human resource of the region's innovative potential.

4. Purpose of the Study

The aim of the study is to demonstrate the formation of the professional culture of young specialists through highlighting the leading motive for training, analysis of their scientific, research activities and career orientation by the example of undergraduates of the Ural Federal University and classification according to the criteria in accordance with the requirements of the innovative development of the region

5. Research Methods

The research methods were an institutional analysis of the region's innovative economy, a systematic analysis of the professional culture of university graduates, and requirements for specialists in the region's labor market. A secondary analysis of statistical data on the educational, research and scientific activities of future specialists, a survey method for studying the formation of the professional culture of specialists, identifying their life priorities and the leading motive for studying at the university, and a classification method are used. As an object of observation, we selected undergraduates of technical and natural sciences at the full-time university, who are studying in the second year. Out of 4616 undergraduates of all specialties who met the requirements of the sample and 315 people were selected. The criteria were direction of preparation, course and age. The survey was conducted from February 5 to February 30, 2020 by the method of group handout questionnaires in the classrooms of educational buildings (usually after exams or consultations) and in dormitories. A total of 445 undergraduates between the ages of 21 and 28 who were studying in the second year were interviewed by spontaneous/random selection. After rejecting questionnaires with missing questions and correcting the sample, it was decided to leave 315 valid questionnaires reflecting the proportional structure of students at 9 institutes. Questionnaires with missing answers were rejected, having incorrect answers to the question, questionnaires that are outside the quotas. As follows from the data in Table 1, the sample

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structure completely repeats the structure of the general population (the error arises due to rounding), it can be considered representative with an allowable marginal error of not more than 5%.

Table 01. Distribution of undergraduate students by institute in the general and sample populations

Institute	Total	%	Selected	%
Institute of Natural Sciences and Mathematics	748	16,20	52	16,51
Institute of New Materials and Technologies	872	18,89	60	19,05
Institute of Radio Electronics and Information Technology - RTF	459	9,94	31	9,84
Institute of fundamental education	433	9,38	29	9,21
Institute of Mechanical Engineering	409	8,86	28	8,89
Institute of Construction and Architecture	422	9,14	29	9,21
Ural Energy Institute	499	10,81	33	10,48
Institute of Physics and Technology	468	10,14	32	10,16
Institute of Chemical Technology	309	6,69	21	6,67
Total	4616	100,00	315	100,00

A paper questionnaire was used for the survey, which contained 7 thematic blocks. There were a total of 29 questions, including tabular questions, which amounted to 53 source variables. We used conditional indices for variables with an ordinal scale of measurement - points, intervals, means; they were presented in a pseudo-quantitative form. This made it possible to calculate the conditional average and sort by the index (for example, the index of satisfaction with various components of training), and use this data for calculations.

6. Findings

The study was conducted on the basis of Ural Federal University (UrFU). It is one of the largest universities in Russia; it has over 35,000 students and over 4,500 research and teaching staff. Today, quite a lot is being done at UrFU for the formation of a professional culture both for students and for the academic staff.

In order to achieve the strategic goal contained in the development program of the Ural Federal University for the formation of an advanced educational, research and innovation center in the Urals Federal District, the following tasks were set in the innovation sphere: creating a system for training elite engineering personnel; the development of research and innovation, as well as the material and technical base and infrastructure for conducting fundamental and applied research of a world level and the production of innovative knowledge and technologies that contribute to the development of priority sectors of the Urals Federal District and the country as a whole.

A significant role in the formation of a professional culture of a specialist is played by such a personal component as professional sustainability. Being a leading component in the personality structure, professional sustainability, along with a focus on career and self-development, contribute to the achievement of a high level of training of a future specialist through the development of such personality qualities as independence, responsibility, passion for the future profession - professional culture. The set of conditions that determine the successful formation of a professional culture of students is presented as follows: the optimal mode of organization of educational and research work; involvement of students in modern forms of scientific work; independent choice of the learning path; organization of self-knowledge

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and professional self-education; the presence of teamwork skills in the process of project training; professional stability throughout the entire period of study.

Consider the formation of professional culture among undergraduates of the second year of study. To conduct applied research, we selected 315 undergraduates in technical and natural sciences, as it is they who have the expectations regarding the creation of a new innovative economy in the industrial region, built on breakthrough development. So, our survey of undergraduates confirms that the choice of an educational institution for master's training is primarily related to the current status and rating of the university and the demand for graduates of this specialty in the labor market is only in fifth place. These results show that, not for all undergraduates, demand on the labor market is an important factor for choosing and getting an education; accordingly, they are not a homogeneous group. Despite the fact that the master program is the second stage of higher education, for many undergraduates the choice of study program was randomized (Table 02).

Table 02. Determinants of university choice by graduate students of UrFU, %

Criteria	**%, from total**
University status	25,0
Master's program as a continuation of bachelor	16,5
Number of contract / budget places	16,0
The cost of the program	9,5
Demand in the labor market for graduates of this specialty	8,0
Prestige of the program	7,5
Institute and program characteristics	7,0
Social infrastructure of the university	5,5
Other	5,0
TOTAL	100

Let’s take a look at the analysis of the activities of future specialists. The master's curriculum suggests that students in the learning process not only study disciplines, but also conduct their own research, scientific and publication, practical and project activities. However, the analysis of these types of activities among 2nd year graduate students showed heterogeneity of indicators. In general, the decision to study on the master program is influenced by several motives. The first one is the attitude to the fact that after graduation it is easier to make a career in any type of professional activity. The second motive is associated with the installation for the extension of training as a delay in the start of work. The third motive of students, graduate school as preparation for the transition to the next level of study in the triune structure of "undergraduate-graduate school" and further scientific activities. The fourth, concomitant motive, receiving a deferment from military service.

Scientific and research work is a serious mechanism for self-realization of undergraduates. However, not all students are motivated for this activity. Differences in motivation for scientific and research work also affect publication activity. Depending on the leading motive for obtaining the second stage of higher education and the results of research, scientific, educational and labor activity, we undergraduates had four groups (types) and their classification was carried out. The main criteria for the typology of undergraduates were indicators: motivation for obtaining the second stage of higher education, the effectiveness of educational activities, motivation for studying and research, motivation for

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the profession, satisfaction with training, criteria for choosing a university and specialty, professional plans of graduate students, work experience, value orientations of undergraduates, life goals, forms of reimbursement of training costs. This made it possible to determine the differentiation of their professional and personal qualities. As a result, models of undergraduate groups were constructed, which, on the basis of the qualitative characteristics of compliance with the innovation economy, identified four conditional groups.

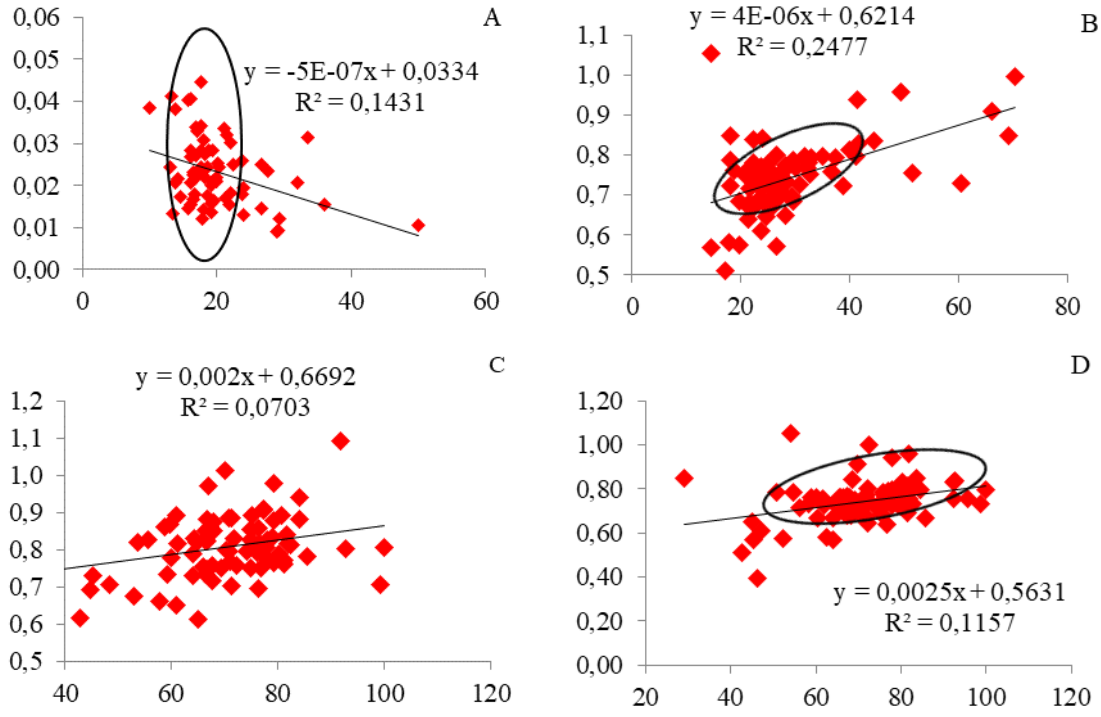

Figure 01. Assessment of the sensitivity of some factors making up the educational, scientific, everyday life of undergraduates

As a result of constructing mathematical models on the basis of the selected indicators, we revealed a high correlation of the educational performance indicator with some qualitative and quantitative indicators (and vice versa), which confirmed our preliminary expert division of undergraduates into groups. Figure 01 (A) reflects the dependence of two factors: the effectiveness of training and the form of cost recovery, Figure 01 (B) - the effectiveness of training and acquired work experience. Figure 01 (C) shows a weakly expressed dependence of the “work for soul” factor among an array of undergraduates on the learning outcomes with a certain concentration of this factor among medium-successful undergraduates. Figure 01 (D) reflects the severity of the factor of publication activity from the effectiveness of training.

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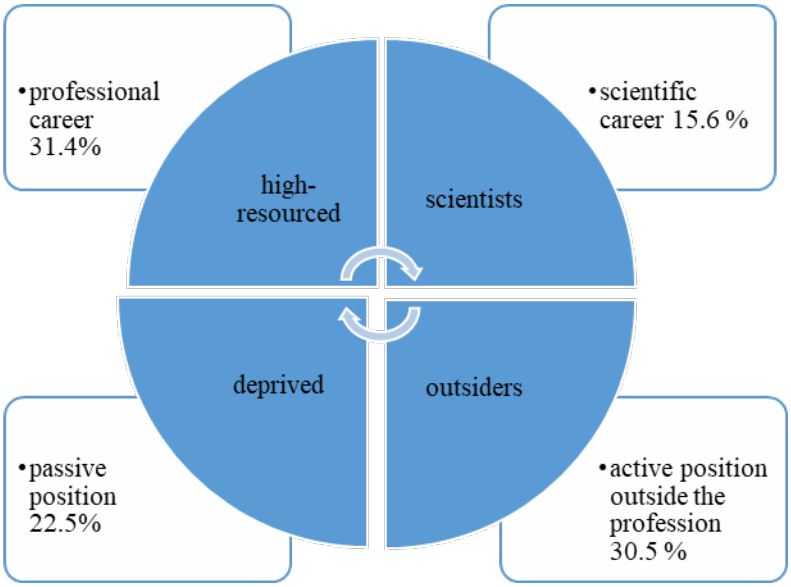

Figure 02. Typology of future specialists

Thus, depending on the leading motive for obtaining the second stage of higher education and the results of research, scientific, educational and labor activities, we selected four groups (types) of undergraduates and classified them. Consider the results of various types of students' activities according to the proposed types (Figure 02) as part of master's studies for a 3-semester period (Table 03).

Table 03. The results of the educational, research, scientific activities of undergraduates

Type	Grade point average 1-3 semester	Number of publications for 3 semesters of study	The percentage of contract students, %	Work experience, %	Number / percentage (%)
High resourced	4,67	2,1	3,0	76,0	99 / 31,4
Deprived	4,11	1,1	12,7	35,2	71 / 22,5
Scientists	4,96	2,9	0	30,6	49 / 15,6
Outsiders	3,72	0,7	16,6	57,3	96 / 30,5
	4,365	1,7	8,075	49,78	315/100,0

The first group (31.4%) is “high-resource”, they have pronounced abilities for scientific activity and innovative activity, the number of publications for three semesters of study is 2.1 publications per 1 undergraduate. Representatives of this group implement moderately high indicators of educational activity, an achievement score of 4.67. The percentage of students on a contract form of training is small, only 3%. Representatives of this group have extensive experience both in professions close to the field of study (technical experience and programming), and those far from it (bartenders, security guards, product deliveries, etc.). Students under the contract pay their own tuition. The leading motive is career building.

The second (22.5%) – “deprived”, who are in unfavorable material conditions, do not have broad scientific and educational potential, have difficulty building communications, don’t see their mission in life, and they see in the magistracy an opportunity to extend the training time and postpone the decision on professional implementation. Representatives of this group demonstrate medium-high academic performance indicators (4.1 points), however, the lack of motivation for their career growth negatively

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affects publication activity – 1.1 scientific publications per person. Among them, the share of students under the contract is higher (12.7%), representatives of this group often do not realize their professional desires, but the wishes and attitudes of parents, who pay for the contract for training. Only one third of undergraduates have experience. The main motive here is academic employment as a form of avoiding problems.

The third group includes “scientists” (15.6%). Representatives of this group have a set of characteristics that allow them to engage in scientific activities, and therefore studying at the magistracy is only a continuation of their educational trajectory and the beginning of a scientific one. Most of them may continue their scientific work in graduate school, and a research and teaching career is open for them. Their indicators reflecting educational and scientific activities are extremely high, the average score is 4.9, and the number of publications is even higher than required by the Federal State Educational Standard - 3.1 publications per graduate student. The combination of work and study is not so popular among this group of undergraduates compared to the group of “high-resource” ones - they have 30.6% work experience, this is usually work related to laboratory and research activities, most of them are employed in specialized departments in their field study. The leading motive here is to build a scientific career, possibly teaching.

The fourth group contains young people who, according to objective and subjective indicators, are the least promising for scientific and scientific-pedagogical activity, “outsiders” (30.5%). These are people who basically just imitate study and work on a master's thesis.

Of the total number of undergraduates, 24% have academic debts, 89% of which fall to the group of outsiders, which, of course, is reflected in their average grade point, it is the lowest of all groups - 3.72, the number of publication activity is also below the norm, for one undergraduate Only 0.7 publications for the entire training period. The share of employees among them is high and amounts to 57.3%, their work in the vast majority of cases is not related to their future profession, this is mainly the activity of the service sector (consultants, promoters, food delivery companies, waiters, fitness trainers, etc.). The leading motive is related to obtaining a deferment from military service, formal higher education, which will not be connected with further professional activities. Undergraduates are significantly differentiated by the success of training and the efforts spent on achieving the result. We see three types of undergraduates out of four as completely motivated - “scientists”, “high-resource” and “outsiders”. However, representatives of the latter group do not demonstrate such an important component, in our opinion, as professional stability. Over the years of study at the university, “outsiders” have changed their field of activity and are not of interest to the innovative economy as highly qualified specialists. In this classification, we see two groups of undergraduates as promising, these are “scientists” and “high-resource”. Representatives of these groups, as a rule, demonstrate good results both in academic work and in research activities. They possess the skills to work with scientific material, quickly reorient themselves to new methods and techniques of work and research, are clearly focused on the result, show a high level of professional stability, which, of course, raises their “cost” in the regional labor market. In a modern innovative economy, representatives of these groups respond to rapidly changing socio-economic conditions and can actively participate in the creation of a new socio-economic space in the region.

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7. Conclusion

Universities, in order to achieve high indicators in the formation of a professional culture of young specialists who meet the innovative development of the region, are forced to orient the content of educational programs to the requirements of employers and actively involve students in scientific and research activities. Participation not only in educational, but also in research activities will certainly increase the competitiveness of a university graduate and will allow saturating the labor market with specialists of a new professional culture.

We conducted an audit of second-year undergraduates according to such criteria as the leading motive for educational activity, academic performance (average score for three semesters), research and scientific activity (number of publications), form of training (contract / budget form), work experience and work experience in specialty. Based on these criteria, undergraduates were divided into four different-sized groups (high-resource, deprived, scientists and outsiders). Each of the identified groups has a set of specific characteristics and, to varying degrees, meets the demands of an innovative economy; representatives of these groups are able to integrate into the economy and the regional labor market in different ways. We see two groups of undergraduates as the most promising, these are “high-resource” and “scientists,” together their share in the total share of undergraduates is 47%. Both of these groups have a similar professional culture, a tendency to scientific and innovative activities, with the applied character of “high-resource” and the more research character of “scientists”. Human resources are the basis for the formation of the innovative potential of the region. It is the representatives of these groups that we see as a human resource for the innovative potential of the industrial region.

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