

Developing a model for pre-university training of a lyceum for the gifted children of the Kemerovo region within the framework of the region's sustainable development

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Abstract. The article presents the rationale for creating a model of the pre-university lyceum training at the University of Kuzbass focusing on key sectors of the regional economy of the Kemerovo region in order to prevent the outflow of talented and gifted young people, which is necessary for modernizing the economy and social sphere of the region and its further innovative development. The presented project will contribute to the formation of a creative educational environment in the lyceum at the base university. As a result this will provide significant educational positions in the Kemerovo region, focused on the development of human capital.

Keywords: pre-university training, lyceum, gifted children, educational process

1. Introduction

The Kemerovo region (KR) is one of the most densely populated region of Western Siberia. But along with this, the dynamics of population decline, and the population outflow to other regions is observed. In the region, 2 million 695 thousand people live, which is 1.8% of the population of Russia and 14% of the population of the Siberian Federal District (SFO), as of the beginning of 2018. In terms of population, the Kemerovo region ranks 16th among the regions of Russia and 3rd among the regions of the Siberian Federal District. The regional center is the city of Kemerovo, which has the population of 556.9 thousand people [1; 2].

The migration outflow of the population was noted in the Kemerovo region, reaching 520.6 thousand people in total (but 27.3 thousand less arrived) in 2011-2018. This requires strategic level decisions to change the current unfavorable situation. The above is reflected in educational processes. Many applicants from the Russian regions tend to enroll in universities in Moscow and St. Petersburg. According to the monitoring of the quality of admission to universities of the Higher School of Economics (HSE), in the universities of St. Petersburg, the percentage of non-resident entrants enrolled in the first year was the largest in Russia (68%) in 2014. Moscow was ranked second. At the same time, less than 2% of applicants dropped out of Moscow and St. Petersburg universities [3].

More than that, the experts of the Higher School of Economics conducted a study of the relevance of the higher education system in the regions of Russia [3]. They analyzed two main criteria: (1) the outflow of applicants and (2) graduates of universities from the subject of the Russian Federation. According to these indicators, experts attributed the Kemerovo region to the "closed" regions. This implies universities in the region are not in demand among school graduates and work on the local

labor market. Despite the significant outflow of school graduates, they retain a significant proportion of university graduates. There are 20 such regions: the Republic of Komi, the Trans-Baikal region, the Chechen Republic, the Kaliningrad, Lipetsk, Sakhalin regions, the Krasnodar region, and other subjects of the federation [3]. Thus, the number of school graduates in the Kuzbass was at the level of 10,300 people in 2015. Then immediately after graduation, only 4807 people (46% of the total number of school graduates in the region) were admitted to the higher education institutions. Taking into account those who go to the army or enter secondary special educational institutions, this number rises to 69% [2]. This figure is still significantly lower than in neighboring regions. In the nearest Siberian cities, these figures are more than 100%: 142% in Novosibirsk, 195% in Tomsk, and 123% in Omsk. This means that, on the contrary, applicants come to neighboring regions to enroll in universities.

The second indicator estimated by the HSE experts is post-graduate migration. Here, the experts correlated the total number of employed graduates of universities in the region with the number of those who found jobs outside of it, on the basis of which they calculated the migration rate. It is 30% in the Kemerovo region, which allowed specialists to classify the region as a “closed” one, because the majority of former students remain within the boundaries of the subject of the Russian Federation.

The struggle for applicants with competing universities in nearby cities is one of the key challenges facing the Kemerovo State University (KemSU). Tomsk, Novosibirsk, Krasnoyarsk also belong to such cities. This challenge is manifested in the consistently decreasing dynamics of the student population from 2008 to 2017. The number of full-time students during this time in KemSU decreased by 12% in budgetary places and by 20% in contractual recruitment. These trends are not unique to KemSU, since Kemerovo is geographically close to the advanced centers of higher education in the Siberian Federal District.

The following branches constitute the structure of the regional economy: the coal industry, ferrous metallurgy, and the chemical industry. Assessing the internal and external factors of the social and economic development of the Kemerovo region, accumulated investments, as well as investment projects prepared for further implementation, we can draw the following conclusion. In the long term, the main development scenario of the Kemerovo region is a growth scenario with preservation of the basic sector of the economy [4]. Thus, the industry of the region needs highly qualified personnel, which requires the use of a cluster approach to the development of the region and the formation of its innovative core, i.e. solving the tasks assigned to the supporting university.

In general, the university is ready for the implementation of the key mission of the supporting university, which is to prevent the outflow of the talented and gifted youth. This is necessary for the modernization of the economy and social sphere of the Kemerovo region and its further innovative development.

We see the creation of a lyceum boarding school at a basic university in Kemerovo (the regional center of Kuzbass) with a focus on key sectors of the regional economy as one of the ways to solve the existing problem of the talent and perspective youth outflow. Consequently, the aim of the project work is to develop a model for the creation in the Kemerovo region of a specialized lyceum at a regional support university.

In accordance with the goal, we have formulated a number of tasks to be addressed in this work: (1) to study the existing models of lyceums at universities, identifying the general and particular in their creation and activities; (2) to determine the demand for training areas in the Kuzbass from the parents of applicants, the applicants themselves, and the employers of the Kemerovo region, in order to determine the directions of training in the specialized lyceum; (3) to develop a model for pre-university lyceum training at the University of Kuzbass.

The project implementation plan involves the following steps: (I) coordination of the administration of the KO and the Ministry of Science and Higher Education of the Russian Federation on the establishment of the first lyceum in the region at the base university, focused on training the qualified personnel for the regional economy 2017-2019; (II) a phased implementation of the project during 2017-2023. This will allow creating the most effective and expedient model of a specialized lyceum at a university in the Kemerovo region.

2. Materials and Methods

To determine the priority directions for the lyceum, we analyzed the directions of the supporting university, in order to determine the most popular ones. In March 2018, together with the research laboratory of the KemSU, a sociological survey was conducted. In particular, the opinions of schoolchildren and parents were studied. Their preferences and motives for choosing a training direction during the “Open Day at KemSU” were revealed. Our research is based on conducting a questionnaire and using a cluster sample. A total of 272 people took part in the survey: 66 men (boys), 24.3%; 204 women (girls), 75%. Two people did not reflect their gender, which accounted for 0.7% of the total number of respondents.

3. Results

The challenge facing the supporting university of the Kuzbass is the migration outflow of the talented youth to nearby cities (Tomsk, Krasnoyarsk, and Novosibirsk). The Kemerovo region has recently experienced difficulties in providing the qualified professional staff due to these outflow dynamics. One of the ways to solve the existing problem of recruitment to the basic university is to create a university lyceum-boarding school, where the gifted students of the region would be able to study with the possibility of further education at the basic university. In the course of solving the research problems, the following results were obtained.

First, several options for working with the talented and gifted children exist. One of them is the opening of specialized lyceums at universities. These are the educational institutions according to the type of specialized educational and scientific centers (SESC), with the possibility of further training at the university. A common feature of their activity is that all of them are aimed at providing services in the implementation of educational activities in educational programs of basic general and secondary general education related to the in-depth study of certain subjects. Also, common to their activities is the creation of conditions for the creative individual development. Distinctive features of these institutions are their organization principles and educational process profiles. We analyzed models of the leading Russian Lyceums (Lyceum of the Higher School of Economics, Gorchakovskiy Lyceum, Economic Lyceum at the Plekhanov Russian University of Economics) and proposed a model of pre-university lyceum training for the gifted children at the Kemerovo State University. A lyceum will be created for children with high academic abilities and supported by the high-tech enterprises of Kemerovo.

Second, as part of a pre-project study, a sociological survey of applicants and their parents was conducted. Additionally, the labor market of Kemerovo, as the regional capital of Kuzbass, was analyzed, its needs were determined. Having studied the labor market, we identified several popular specialties that are needed by the city and the Kemerovo region: electrical engineers, chemical engineers. The main subjects of the Unified State Exam when entering these areas are Physics and Chemistry. Thus, the first two profiles for the Lyceum were chosen.

Third, the draft model of the pre-university training of the Lyceum is proposed. The task of the Lyceum is to search for the gifted and talented children. The main university sees the creation of a boarding school as a way to “grow” the talents and gifted children. They will demonstrate the prestige and status of training at the lyceum. When building a model, emphasis was placed on creating an attractive environment for the talented youth. This environment will ensure the reproduction of competitive personnel for municipalities of the region.

In studies [5-10], the opening of high schools at universities is considered as one of the important mechanisms for improving the quality of higher education, intensifying scientific research, searching for, and training future scientific personnel that form the basis of the intellectual elite of the university. Therefore, the development of the concept of creating a specialized lyceum, its implementation is the first and an important step towards retaining applicants in the region. The specialized lyceum at the university will ensure the creation of an educational and creative environment for the preparation of future applicants with the competencies required by the personnel partners of the supporting university of the Kemerovo Region.

The advantages of opening such an organization include the following:

- There is a permanent land plot of a supporting university. As a result, there is no need to coordinate and execute the transfer of a land plot from municipal/regional property to the ownership of the Russian Federation;
- The positive experience of the KemSU in the construction of social infrastructure facilities.

In conditions of intense competition among universities at the regional and federal levels, the policy of building a new configuration of higher education can serve as an additional stimulus for the development of the regional economy.

4. Discussion

A powerful system of pre-university training exists in the basic university of the Kuzbass. As part of this training, the following activities are being carried out: identifying and attracting the talented students who are motivated to study for admission to a university; selecting the gifted children through a system of competitions at various levels; a profile orientation of applicants; developing higher education programs.

The proposed project allows us to assume that, in general, the lyceum graduates at a basic university would choose institutes and areas of training that are close to the profile of their studies and unconditionally go to universities.

Principles of organizing the educational process in the Lyceum can be reduced to the following:

- A high degree of interaction with their institute (professors of specialized departments conducting classes; students using university laboratories and library resources);
- A maximum closeness to the university system of education (lecture courses, workshops, labs and colloquia, final workshops, semester tests, etc.);
- A new qualitative composition of the teaching staff and students (more than 250 professors, associate professors and experienced teachers of the university participate in the educational process, etc.);
- A solid educational and methodological support of the educational process (developing new curricula in core subjects and new educational areas in the variable part of the curriculum, etc.);
- Creating a versatile system of career guidance for the individual (vocational education includes a set of systemic measures).

5. Conclusion

The main difference between a boarding school at a basic university and a regular school is that the university teachers teach children, while students and young teachers become curators (tutors). Such an approach will contribute to a more detailed two-year familiarization with the environment of the university, the involvement and possible admission of lyceum graduates to the supporting university. As a result, such an approach will allow minimizing the outflow of “high-scorers” outside the Kemerovo region.

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