Advances in Social Science, Education and Humanities Research, volume 447
Proceedings of the International Scientific Conference on Philosophy of Education, Law and Science in the Era of Globalization (PELSEG 2020)

Olympiad Movement in the Partnership "School – University – Enterprise"

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Abstract **— The article studies the role of university olympiads and competitions for schoolchildren and students. The article presents activities of the branch of Ufa State Petroleum University in Oktyabrsky working with gifted youth and holding events as part of the strategic project "Supporting University". The experience of holding olympiads and creative competitions for schoolchildren together with leading enterprises of Bashkortostan (NPF Packer LLC, PetroTul LLC, Bashneft-Dobycha LLC, NGDU Tuimazaneft, Oil Service in Tuymazin district) is described. Key performance indicators of the Olympiad movement in the system of network cooperation with enterprises are given. An analysis of the indicators allows concluding that educational olympiads and competitions held together with partner enterprises increase the number of winners and prize-winners entering the university. The article discusses forms of continuing education of gifted schoolchildren and their mentors. It is argued that additional educational courses for talented students are more important than olympiads. By attracting talented graduates of secondary schools to the university and their active participation in student olympiads held in partnership with leading innovative enterprises, the task of building up the professional elite of the region can be solved.**

Keywords — talented youth, olympiad movement, network interaction

I. INTRODUCTION

In order to solve the large-scale tasks of engineering education, it is necessary for students to choose educational paths. It seems necessary to have a social significance, relevance and economic viability of a profession. But if the school does not train qualified graduates, they will not enter technical universities and will not master difficult but interesting professions. Therefore, it is necessary to increase the level of school education and promote achievements of science and technology among young people, increasing their interest in studying at technical universities. Olympiads performing career guidance, qualification and motivational functions can help universities. In addition, the rules for admission to universities provide an opportunity for winners and prize-winners of olympiads to have admission benefits. This encourages a large number of students to participate in the Olympiads.

The olympiad movement is becoming an integral part of education system. In Russia, intellectual competitions have been held since the 19th century. Initially, Olympiads for schoolchildren were organized to select the most talented young people for further research activities. Then the olympiad movement became a form of the activity-based approach to education, a creative event, evaluating students' achievements, and a basis for effective education [16].

Due to the emergence of the "war for talents", professional-orientation olympiads are held. Their co-organizers are large corporations, regional organizations and leading enterprises. They allowed solving the problem of "brain drain," which has escalated over the past two decades, especially in the Russian regions [3]. The traditional system of vocational guidance for schoolchildren has transformed into an effective system of vocational guidance for students with participation of universities and enterprises. The regions are creating conditions for a successful professional career for graduates of secondary and higher educational organizations. At the same time, special attention is paid to the professional navigation of gifted children and talented youth, involving them in the creation of small innovative enterprises on the basis of universities [8].

II. PROBLEM STATEMENT

According to the instruction of the President of the Russian Federation, by 2024, it is necessary to develop an effective system for identifying, supporting and developing abilities and talents of children and youth based on the principles of justice and universality and aimed at self-determination and professional orientation of all students" [14]. The goal of all Russian universities is to identify and support gifted children. In many regions, including Bashkortostan, campuses with university-based centers have been created. Regardless of the format and location, the mission of these centers is to create an environment to identify gifted children and develop their potential, taking into account staffing needs of the region. Regional universities have a special need for "growing" talents, as they are interested in targeted, quality training of highly qualified specialists for the regional economy.

Supporting and leading universities began to implement their own programs for vocational guidance and accompaniment of gifted children, becoming key participants in regional systems for identifying and developing talented youth. The policy of identifying and supporting gifted children and talented youth in regional universities, including the branch of Ufa State Petroleum Technical University in Oktyabrsky (USNTU branch in Oktyabrsky), is one of the priority areas for the development of a system for identifying and supporting talented children. Since 2018, the strategic project "Attracting and supporting talented youth in the system of multi-level advanced staff training" has been successfully implemented in USNTU branch [6]. Resources of three centers were consolidated: career guidance, further education, and an innovative scientific center. One of the tasks is development of the school and student olympiad movement with the participation of leading regional and city innovative enterprises.

The educational model "school - university - enterprise" is a cluster within which the younger generation is trained professional activities. Vocational training is carried out on the basis of fundamental science.

The educational model "school - university - enterprise" involves the creation of conditions for integrating the educational process with production. This model is aimed at building a system of continuing professional education for schoolchildren, students and young professionals assisted by employers and strategic partners. The educational process is not reduced to schools and the universities. It involves a whole range of different social relations, forming a multidimensional educational space within which schoolchildren and university students can gain practical experience in solving professional and personal problems.

Within this model, there is a continuity of research and technological activities of schoolchildren and students. New conditions of the integrated educational process contribute to revealing the potential of educational technologies.

The integrated educational process is based on the principles of practice-oriented and individual education, which involves:

- integration of educational programs of the university with educational programs of specialized schools as part of the educational and scientific-methodological interaction, career guidance, diagnostic testing, participation in competitions and scientific and educational events;

- creation of scientific and educational school laboratories in order to expand the professional orientation of students, increase their interest in a particular type of education. Activities of laboratories include integration with departments, excursions for novice researchers to university departments and leading enterprises, master classes by leading researchers of industrial enterprises, demonstration of innovative technologies and products, etc.;

- creative cooperation of researchers of different levels and generations in the format of contests, exhibitions, etc.;

- involvement of young people in professional creativity, taking into account formal and informal training;

- conscious choice of personality-oriented training programs, etc.

There are a lot of advantages of this model for each party - schools, universities and enterprises. The advantages for schools are as follows [2]:

- targeted vocational guidance and early professionalization, development of motivation to master a specific profession;

- in-depth study of subjects, high-quality education and adaptation to university studies;

- intellectual creativity, development of motivation for research and project activities, research skills (creation of school scientific societies, public protection of creative works, participation in scientific conferences, exhibitions, debates, etc.)

The advantages for universities are as follows [1, 4]:

- selection of students who can master higher professional education programs, an increase in the number of applicants who purposefully choose professions;

- development of curricula, qualification requirements for graduates, etc.;

- intellectual creativity of students, development of their motivation for research and design activities, development of research skills (student scientific societies, centers of scientific creativity, etc.);

- joint work on major scientific and technical programs and innovative projects, including the creation of creative groups, teams in order to identify problems in the industry and solve them with the help of R&D, development programs;

- employment of students for the period of training, production and undergraduate practice;

- reduction of the adaptation period for graduates at enterprises, etc.

For the enterprise, this model

- meets the needs of enterprises in specialists of a certain level and qualification;

- contributes to joint project activities and scientific and methodological support of the process of project implementation by universities;

- contributes to the advanced training of employees on the basis of universities;

- enrichment of knowledge and technology, which ensures innovative development of production, etc.

Today, Russia has already accumulated some experience in the development and implementation of such models. Therefore, the importance of educational models "school - university - enterprise" is evident, recognized by the professional community (enterprises, organizations, etc.), the scientific and professional pedagogical community (universities, schools, etc.), and provided for at the legislative level. On the other hand, this model is not popular among universities.

Discussing the possibilities of the “school – university – enterprise” educational model, forum participants argued that this model is not limited to the framework of schools and universities. It is a multidimensional educational space that provides enhanced opportunities for choosing a future profession and obtaining practical experience. On the other hand, if you get into this space, the prospect of moving to another professional space, changing the choice is limited [9]. Nevertheless, forum participants believe that this model has more advantages than disadvantages, and emphasize the need to expand the practice of its implementation [5].

The implementation of the educational model "school - university - enterprise" gives a new impetus to improving the quality of educational services, increases mobility of students and teachers and allows the effective professional orientation of students. As a result, this creates conditions for increasing the competitiveness of the young generation in future professional activities [10].

In addition, as part of the model, not just a group of professionals is formed, but a huge community of university and school teachers, specialists - people who understand what training results are needed.

Enterprises of Bashkiria, in particular of Oktyabrsky and Tuymazy, have strong partnerships with the USNTU branch in Oktyabrsky and are interested in developing and implementing new forms of training, attracting and developing competitive staff. One of them was a system of olympiads and creative contests for schoolchildren, whose organizers are the university and leading innovative enterprises of the region.

Interdisciplinary Olympiads and intellectual creative competitions for senior schoolchildren and graduate students of secondary vocational education institutions give the right to winners and prize-winners of the Olympiads to enter the university and conclude a target agreement with a leading enterprise: NPF Packer LLC, LLC Packer PetroTul ”, LLC“ Bashneft-Dobycha ”, NGDU Tuymazaneft, Oil-Service in Tuymazin district. These companies can pay the scholarship. Winners and prize-winners of Olympiads receive valuable prizes and the opportunity to have a mentor from the enterprises [13].

In particular, they can receive 10 additional points to the points of the Unified State Exam (winners and prize-winners of competitions - five additional points) and additional scholarships (in 2019, the amount of additional scholarships amounted to 10,000 rubles per month for winners and prize-winners of olympiads). The key indicators of the effectiveness of the olympiad movement are as follows: 1) the number of olympiads and intellectual creative competitions whose co-organizers are leading innovative enterprises of the republic; 2) coverage of schoolchildren and students involved in the olympiad movement in the school-university-enterprise partnership system; 3) the number of winners and prize-winners of the regional or final stage of the All-Russian Olympiad for schoolchildren; 4) the number of winners and prize-winners of olympiads and contests studying at the university under target agreements with partner enterprises.

III. Results and Discussion

The analysis of indicators allows concluding that olympiads held in cooperation with partner enterprises increase the number of winners and prize-winners of these Olympiads and regional or final stages of the All-Russian Olympiads for schoolchildren, as well as olympiads from the list of the Ministry of Education and Science of Russia

A survey of freshmen participating in olympiads showed that active cooperation with enterprises of the Republic of Bashkortostan improved the image of the university and became a decisive factor in choosing a university for 67% of respondents. Along with olympiads and creative contests for schoolchildren, the university and employers of enterprises hold student olympiads [12]. The department of Information Technologies, Mathematics and Natural Sciences is a leader in this area. On its basis, scientific-technical and scientific-methodological conferences are annually held. The department of Exploration and Development of Oil and Gas Fields also holds specialized olympiads [11].

Additional education of schoolchildren and mentors in the system of supporting gifted children. Participation in olympiads or contests is a way of self-expression and self-realization. Almost every child has a need for competition, children like competing, feeling part of the intellectual community, comparing their success with that of their peers. However, one should not forget that it is valuable not only to hold olympiads and find talented children, but to organize regular classes in additional education centers. Therefore, USNTU organizes classes within various programs of additional education, in particular within the Small Physics and Mathematics Department, whose teachers help each child build his own educational trajectory. The Small Physics and Mathematics Department is an intellectual and creative educational environment for gifted senior schoolchildren. The material and technical resources of the faculty of applied mathematics, physics, and information technology are widely used [7]. This allows implementing applied programs, developing meta-subject skills in schoolchildren and maintaining their interest in project activities. Along with training, USTU holds master classes, conferences, panel discussions, round tables, seminars and various intellectual events. The program combines and systematizes advanced theories, practices and technologies [15].

IV. CONCLUSION

The experience of the branch of Ufa State Petroleum University in Oktyabrsky indicates the relevance and effectiveness of the network interaction of multidisciplinary universities with schools and enterprises in organizing career guidance events to support talented youth. The systematic approach implemented by the university (the vocational guidance center and the center for additional education of gifted youth) encourages students to choose professions that are in demand in the Republic of Bashkortostan.

In our opinion, the experience of the USNTU branch confirms the effectiveness of this partnership. Within this project, university teachers and psychologists work with students to help them solve problems of professional self-determination. Individual educational trajectories are built in the conditions of network interaction "school - university - enterprise".

Thus, due to the participation of schoolchildren in the olympiad movement and the partnership of the university with leading innovative enterprises, the task of building up the professional elite of the region by preserving talented applicants and graduates is being solved.

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