

VII International Forum on Teacher Education

Conceptual Framework for the Specialized Education System Implementation for Children in the Kaliningrad region

Anna O. Budarina* (a), Alexandra S. Zyolko (b), Margarita I. Korotkevich (c),
Tatiana E. Petrova (d)

(a), (b), (d) Immanuel Kant Baltic Federal University, 236016, Kaliningrad (Russia), 14 Nevskogo street,
(c), Ministry of Education of the Kaliningrad Region, 236000, Kaliningrad (Russia), 10 Zhelyabova Str.
e-mail: AZelko@kantiana.ru

Abstract

The article discusses the relevance of the introduction of innovative forms of specialized education for children; it is proposed to get acquainted with the experience of implementing such a project on the basis of the IKBFU. The tasks of the educational project "Star of the Future" are revealed - the integration of general and additional education and future employers in order to expand the possibilities of vocational guidance training for children studying in specialized classes, mastering specialized subjects in various educational forms (modular training, project and online training, work in university laboratories, professional tests at enterprises and organizations), creating conditions for the formation of a child's image of a future profession and its conscious choice. The cluster approach to project implementation is substantiated as a direction in science and practice associated with the search and implementation of new opportunities for the development of society, increasing its welfare and competitiveness through the creation and management of clusters. The features of the project are listed: integration of basic (school part) and additional (university part) education; formation of universal competences, Digital and soft-competencies (including critical thinking, teamwork, communication and others); entrepreneurship training, formation of understanding of the "image of the future and professions of the future"; Deferred contract and targeted training; support and training of teachers who, in partnership with university teachers, implement programs. The quantitative and qualitative results of the project are proposed, the analysis of the effectiveness of the training is carried out for the assessment of which Donald Kirkpatrick's four-level model was used. A conclusion is made about the success of the project and further ways of its development are discussed.

Keywords: specialized training, educational projects, project training, cluster approach, schoolchildren

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Published by Kazan federal university and peer-reviewed under responsibility of IFTE-2021 (VII International Forum on Teacher Education)

* Corresponding author. Email: ABudarina@kantiana.ru

Introduction

Global social, economic, political and cultural transformations taking place in modern Russian society determine the social order and new requirements for the education system. Changes concerning new approaches to the upbringing of the younger generation should ultimately be aimed at increasing the number of highly qualified specialists who contribute to the country's economic growth. The Federal Project “The Success of Every Child”, which is a part of the structure of the National Project “Education”, is aimed at creating an effective system for identifying, supporting and developing the abilities and talents of children and youth, based on the principles of justice, universality and aimed at self-determination and professional orientation of all students. As a result, by 2024, schoolchildren in grades 5-11 should be provided with opportunities to master basic general education programs according to an individual curriculum, comprising network forms, taking into account the results of their mastering additional general education programs and vocational training programs (National Project “Education”).

In all Russian schools, since 2006, in the senior grades, schoolchildren are switching to profile education, in which teaching takes place according to different programs (profiles) with a predominance of certain subjects. It is aimed at expanding educational opportunities and building an individual educational trajectory for every schoolchild. This trajectory presupposes the differentiation of the content of education and the expansion of educational opportunities due to the interaction between general and vocational education, which should provide career guidance and effective preparation of school graduates for the development of higher education programs.

The problem is that, in practice, the interaction between schools and universities is usually not institutional in nature and boils down to attracting higher education specialists to deliver lectures, workshops or certain disciplines. This approach does not guarantee the individualization of education and the achievement of the set goals of specialized education. In this regard, the question arises towards what conditions of profile and pre-profile training contribute to the utmost fulfillment of the concept of profile education and shaping the child's abilities and inclinations, which are so necessary for their future professional development.

Purpose and objectives of study

The Center for the Development of Modern Competencies of Children of the IKBFU was opened for the implementation of the tasks of the national project “Education” on the basis of the Immanuel Kant Baltic Federal University with the support of the Ministry of Education of the Kaliningrad Region (project “House of Scientific Collaboration”).

In order to attract young people to the choice of specialties corresponding to the priority areas of development of the regional economy in 2018, the Baltic Federal University, through the Center for the Development of Modern Competencies of Children, together with the regional Ministry of Education, launched a new project "The Star of the Future" aimed at creating university classes for pre-profile and specialized training.

This is an innovative system aimed at ensuring that schoolchildren of the region as early as possible but at the same time consciously, choose their own path and determine their future professional sphere. The main vector of the project's application was the segment of profile and pre-profile training of students through the implementation of additional general developmental programs in a network form (Method recommendations of the Ministry of Education of the Russian Federation of 06/28/2019 "... on the implementation of additional general developmental programs in a network form").

Thus, the project is designed to solve the following tasks:

- integration of general and additional education and future employers in order to expand opportunities for vocational guidance training for children studying in specialized classes;
- mastering specialized subjects in various educational forms: modular training, project and online training, work in university laboratories, professional tests at enterprises and organizations;
- creation of conditions for the formation of the child's image of the future profession and its conscious choice.

Literature Review

An analysis of successful practices and various models of specialized education suggested that the development of professionally important personal qualities and special abilities are associated with the early immersion of a child in a professional environment. Moreover, an important role here is played by a shift from traditional approaches to changing the position of a teacher to a mentor and teamwork in project learning.

A number of dissertation studies are devoted to specific issues of project learning. Theoretical statements, the genesis of the project method are considered by Blokhin (2005) and Penkovskikh (2007). The conditions for the implementation and effective use of the project method in the educational process are presented by the scientific works of Veselova (2001) and Devyatova (2002).

The prevalence of project-based learning (PBL) has increased significantly. In a study by Almulla it is pointed out that it promotes learners' engagement by sharing knowledge and information. The PBL approach is recommended for use with learners for educational purposes and should be disseminated to universities (Almulla, 2020).

According to Zhylykybay (Zhylykybay, Magzhanb, Suinzhanova, Balaubekov & Adiyeva, 2014), project-based learning is a guarantee for improving the quality of knowledge. As a result of project work, learners become the subject of their creative, educational and cognitive activities. Thus, the technology of project-based teaching, like the anthropological paradigm "subject and subjectivism" plays an important role in the personal development of learners.

Based on the technology of project-based teaching, the educational process becomes an integral system of the pedagogical process, which is based on the educational, cognitive and educational development of students. In accordance with the system of teaching methods of the project, students increase their interests, responsibility, activity, achievement of their goals and objectives, problem-solving skills, thinking, creativity and dreams.

Project-based learning technology leads to substantiated knowledge; it makes it possible to form cognitive, communicative, cultural competences, as well as socio-cultural competences of students (Zhylykybay, Magzhanb, Suinzhanova, Balaubekov & Adiyeva, 2014).

Methodology

The emergence and successful functioning of the innovation system in education is based on the cluster approach. It is a direction in science and practice associated with the search and implementation of new opportunities for the development of society, increasing its welfare and competitiveness through the creation and management of clusters.

The very concept of "cluster" means the union of several homogeneous elements, which can be considered as an independent unit with certain properties.

The modern definition of the concept of a cluster was formulated in the late 1980s by the American economist Michael Porter. In his opinion, a cluster is a group of interconnected organizations operating in a specific area and characterized by common activities and complementary to each other (A Dictionary of Modern English Usage).

In this work, the authors rely on the provisions of Shamova (2008) on the cluster approach.

In the definition of a cluster, the following main characteristics (Budarina, Zelko & Mishurovskaya, 2019) can be distinguished:

- there is always more than one element in a cluster;
- all the elements must be homogeneous;
- all the elements work together;
- the work is performed by them more efficiently than by one element;
- the result differs not only quantitatively, but also qualitatively;
- there is a certain criterion by which this efficiency can be assessed.

The main purpose of creating a cluster is to increase the effectiveness of the use of any subject or method (Semykina, 2010). Any set of homogeneous elements, jointly performing a common function with greater efficiency than a single element and managed as a whole, can be considered as a cluster.

Cluster development policy is viewed as a key innovation initiative, which is determined by two global processes: diversification and integration of education (Rusetskaya & Bartosh, 2019).

Diversification of education is implemented in the process of establishing new educational organizations, introducing directions and specialties, developing innovative courses and disciplines, creating interdisciplinary programs, changing the procedures for enrolling students, monitoring the education management system and others.

Integration ensures close interaction of institutions of specialized education with enterprises of the industry, which should help to harmonize the needs of the labor market with the sphere of providing educational services and create a system of continuous professional education, improve the quality of training and qualifications of personnel in accordance with federal educational standards.

Thus, the implementation of the "Star of the Future" project is based on the principles of the cluster approach in education. Education as a system here is a set of institutional structures, the main purpose of which is to educate students in them. In this sense, it is the core of the educational cluster, which is a set of educational organizations of all levels within a given geographic territory, enterprises - resource suppliers and employers, as well as coordinating bodies and authorities, whose activities are interconnected with the nearest industries and aimed at developing an innovative product.

The Features of the Star of the Future Project are the integration of basic (school part) and additional (university part) education; shaping universal competences, digital and soft-competencies (including critical thinking, teamwork, communication, etc.); entrepreneurship training, shaping the understanding of the “image of the future and professions of the future”; deferred contract and targeted training; support and training of teachers who, in partnership with university teachers, implement programs (Budarina & Zelko, 2020).

Network programs have become a mechanism of interaction with schools, which made it possible to implement the model of lifelong education. Thus, it was possible to build a linear educational process with schools thanks to the segment of pre-profile and specialized training in grades 8-11. At school, learners thoroughly study specialized subjects in accordance with profile training. On separate profile days they were allocated to study practical and theoretical modules at the university. Selection for such university classes was competitive. For a child, this is a two-year program. Every two years there is a selection of the schools of the project participants between which quotas are distributed for new learners. All programs are free of charge.

In the educational process in all educational areas, partners of the university are involved - industrial enterprises and social organizations, so that the children can get to know their chosen profession as closely as possible. For this, internships, excursions, workshops are held. Each direction of the project is supported by specific industrial and social partners who provide students with case studies and project tasks related to the partner's activities, as well as a basis for practice (Mychko, Amtor, & Zylko, 2011).

Results

Kirkpatrick's four-level model (Kirkpatrick, 2016; Pecore, 2015) was used to assess the effectiveness of training in the project "Star of the Future". The study involved 210 people.

The model, which has become widespread in international practice and has already become a classic, was proposed as early as 1959 by Donald Kirkpatrick, professor of scientific learning and development.

The first level is "Reaction". At this level, the reaction of the program participants to the training is ascertained. To assess this level, response sheets or questionnaires using a smile sheet are used, which carries information about the sympathy or antipathy of the audience to the teachers, but does not give practical results. Therefore, when assessing the first level, it is important to establish what kind of information needs to be obtained and on the basis of this to choose tools.

Kirkpatrick offers the following first level assessment tools:

1. Response Sheets, which should include open-ended and scale questions. This can be, for example, a scale for assessing the usefulness, the availability of the material provided, the adequacy of the information, the quality of the equipment, as well as the assessment of the work of teachers, open questions for obtaining information and others.
2. Interview (in order to get feedback, they are conducted immediately after training)
3. Focus groups, which in practice, as a rule, are mainly used for pilot projects.

The first focus group is held one week after the program, collecting the opinions of the participants. The second focus group is held 90 days after the end of the program. Evaluation at this level shows how participants respond to a training program. Kirkpatrick calls this satisfaction score.

The second level is "Education", the main task of which is to assess the knowledge and skills acquired in the learning process. To assess the level, specially designed tests, questionnaires and tasks are used, the purpose of which is to quantitatively measure progress in the knowledge gained.

The third level is "Behavior". Kirkpatrick defines this level as the most important and difficult. It is here that the assessment of how the behavior of the participants has changed as a result of the training takes place, how the acquired knowledge and skills are applied.

The third level Assessment Tools: Behavior Review (Tracking), Behavior Checklist, Focus Groups, Action Plans Review and Action Learning.

Kirkpatrick points out that the absence of changes in the behavior of the participants does not mean that the training was ineffective.

The fourth level is "Results". Assessment at this level is the most difficult. At this stage, the assessment determines how the indicators have changed after training. When it comes to financial data, such as sales, profits, costs, then the contribution of the training is rather difficult to measure, since the training provided is not the only factor influencing these indicators.

Kirkpatrick stresses that outcomes include the changes that have occurred as the participants received training. At this level, the most important thing is to choose the indicator that the training provided affects the most and directly, and to carry out a special measurement of them before and after training.

At the first level, "Reaction", it was important to find out how the participants in the training react directly to the training itself - whether they like it and for what they will use the acquired skills and knowledge.

The second stage is "Training". This level involves an assessment of the extent to which the participants have assimilated new information, whether they have formed the necessary relationships, whether and how much their knowledge has changed attitudes towards the end of the learning process.

At the third level - the "Behavior" level, we determined whether as a result of the training the behavior of its participants changed, whether they apply any of the acquired skills and knowledge in their workplace.

At the fourth level "Results" we evaluated the extent to which the planned results were achieved, and this is the main goal of this level. It is also important to note whether the changes in the behavior of the participants in the training have had any positive impact.

96% of the students answered that the training in the project was interesting and relevant for them, 87% of the learners noted that the training conditions, the volume and quality of the materials corresponded to their educational needs. 97% received new knowledge and acquired new skills in the learning process. 87% took the opportunity to practice applying new knowledge and skills.

The study also examined the impact of the project on various areas: 63% noted that training influenced the choice of a future profession, 46% - on understanding the educational material in specialized subjects, 21% - on improving performance in specialized subjects.

84% of learners noted that the curriculum was a good contribution to their professional development, 74% are ready to recommend this program to their classmates and friends. 84% answered that this program was a good contribution to professional development. 74% of the learners noted that they can apply the knowledge and skills gained in the learning process in the "Star of the Future" project at school.

Discussions

As a result of the launch and implementation of the project from 2018, we can talk about the first quantitative and qualitative results, which form the conceptual basis of the entire project.

The project management structure included the interaction of coordinators from the school and the university to support the education of children. This project management structure was quite successful and the activities of the project coordinators from schools and universities were consistent.

The project received a lot of attention from the leadership of the schools. In addition, at the school level, significant management decisions were made to support the project, including issues of material incentives for project coordinators, the transfer of educational achievements of the project, as well as building individual routes for students.

At the first stage, the project included 18 educational organizations of the Kaliningrad region, and in September 2018 the first 400 students began to study at the institutes of the IKBFU under the guidance of experienced mentors. Laboratories, research centers, professional educational spaces - all this became available to the participants of the “Stars of the Future”.

During the period of 2018-2020, more than 1000 schoolchildren from 40 schools in the region studied in university laboratories such subjects as bioengineering and chemical technologies, the basics of medical knowledge, mathematical modeling and programming, radio communications, routing and switching of computer networks, technologies of modern industry, as well as humanitarian and pedagogical disciplines.

The training was conducted by 50 teachers of the IKBFU according to modular programs that take into account the latest achievements in science and technology. The final task of the implementation of the program for each student is a team project or research that students present at the final competition. The result of the project was new knowledge, prototype and innovation technology. All students were given the opportunity to carry out projects and research in the scientific laboratories of the university and receive an independent assessment of professional experts. For 2 years they completed 120 projects.

The “Star of the Future” Project provides for five areas of training: engineering-technical, engineering-IT, pedagogical, biomedical and socio-humanitarian.

To organize the interaction of students of within the Project with businesses and employers of the region, the university created the Internet platform “Become a pro” at profi.kantiana.ru.

The Platform functionality:

- Possibility of placement by business partners of real problems for schoolchildren and students.
- The ability to record information about the success of the courses taken in your personal account.
- Ability to choose a mentor from those registered on the site.
- Ability to unite in teams to complete the selected task.

- Ability to view basic information about the achievements of the student for business partners.
- Ability for mentors to assemble a team to solve a problem.

The modules of the program are held both at the university itself and at external sites. Pedagogical classes are taught in schools, medical - in hospitals, information technology - in IT companies. This is how schoolchildren get to know their future profession as closely as possible. Those who go through the project gain a competitive advantage over peers who did not have this experience.

For example, high school students who enroll in the IT direction have the opportunity to receive a certificate from one of the world's largest companies specializing in high technologies - CISCO. In fact, this is a "postponed diploma" recognized by the professional community, which everyone can "activate" after he turns 18. Young teachers receive a certificate of a junior counselor, and doctors are a junior nurse. 45 postponed employment contracts, motivation letters were signed by employers of the region on the intention to work with the best graduates.

Thus, integrating knowledge from various subjects in practice, learners understand the importance of their future profession. At the end of the training module the university guarantees the best students additional points for admission to the chosen training profile, and the leading enterprises and organizations of the region conclude deferred contracts with the students, which guarantee them jobs at the end of their vocational education.

In addition, according to the results of the program, the educational competition "Star of the Future" is held annually at the university, as a result of which learners receive additional points upon admission to the IKBFU.

The purpose of the competition is to strengthen the role of additional education aimed at pre-profile and early profile training, expanding opportunities for the intellectual, creative and personal development of the younger generation.

The objectives of the Contest are:

- creation of additional opportunities for students upon admission to the IKBFU for the educational degree program for Bachelor's / Masters'.
- identification and support of talented learners, active involvement in various forms of career guidance,

- identification and analysis of best practices and initiatives, as well as tools for the implementation of additional general education programs of pre-profile and early profile training.

Conclusion

Thus, the “Star of the Future” Project is an attempt to educate a scientist at an early stage and integrate him\her into the university, and later into the scientific organizations of the region, thereby ensuring shaping the scientific potential of the region by early involvement of schoolchildren in scientific activities. By combining educational innovation, knowledge and industrial production, we identify innovators at an early stage and develop technology entrepreneurs. For children, the "Star of the Future" Project is an opportunity to get into the academic environment and be useful, shaping an academic culture, a different role of a teacher as a teacher, mentor, colleague, acquainted with scientific activities. This is an opportunity to find your place in life, to make a conscious decision in life. The student also becomes a part of the student environment in which he can develop and improve himself, satisfy his desire for self-development, and this university creates for him in the form of a variety of conditions, and his task is to take advantage of these conditions. The next priority task facing the university and the region is the education of young scientists. Within a few years, an innovative scientific and technological center "Baltic Valley - HUMANTECH" will appear in the region, which will require an influx of a large number of young scientific personnel. In addition, young scientists are needed to develop the scientific potential of the university itself.

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