Роль проектных и социальных инициатив в программах среднего и высшего образования

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Аннотация. Статья описывает проблемы и перспективы развития проектного обучения и внедрения социальных инициатив в программы обучения средней и высшей школы. Приводятся успешные практики реализованных проектов при участии школьников и студентов, подготовленных по описанным программам. Отмечается актуальность разработки программ, направленных на подготовку субъекта, готового к самореализации, самоактуализации и саморазвитию. Представлен проект, который направлен на создание детско-юношеской научной академии по развитию навыков проектной деятельности для поддержки детей и педагогов из школ с низкими образовательными результатами.

Ключевые слова: социальная инициатива, проектное обучение, новый курс, программа магистратуры.

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The role of project and social initiatives in secondary and higher education programs

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Abstract. The article describes the problems and prospects for the development of project-based learning and the introduction of social initiatives in the curriculum of secondary and higher schools. Successful practices of implemented projects with the participation of schoolchildren and students prepared according to the described programs are given. The relevance of developing programs aimed at preparing a subject ready for self-realization, self-actualization and self-development is noted. A project is presented, which is aimed at creating a children's and youth scientific academy to develop skills in project activities to support children and teachers from schools with low educational results.

Keywords: social initiative, project-based learning, new course, master's program.

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INTRODUCTION

The basics of design and research activities are today an obligatory part of the school educational program. A variety of competitions and Olympiads of intra-school, city, regional and all-Russian levels are available for schoolchildren. For teachers, the participation of their students in such competitions is also mandatory. This often leads to the fact that the independent work of schoolchildren is replaced by the implementation of projects by teachers or parents. Coming to the defence of such projects, schoolchildren cannot present and defend the project, answer the questions of the expert commission.

Project topics are also often not chosen by the students themselves. At the same time, an important fact is that, according to the experience of the project team, schoolchildren have an interest in research and project activities.

When conducting additional classes in invention in schools with low educational results, we found that such children often begin to feel that they are not successful due to the fact that they do not have the opportunity to show their results in front of their peers. They are not always able to formulate their interests, to determine the topic that is of interest to them. They do not have the opportunity to get advice from a teacher on a topic of interest to them, since often the teacher does not have time for counselling.
There are no clear and simple educational and methodological manuals that help schoolchildren complete a scientific or research project, allowing teachers to provide methodological and consulting assistance. Schoolchildren need help not only in preparing a project, but also in the ability to present a project (perform illustrative design, write abstracts, annotations), make a short and effective presentation, and answer questions. It is very important to teach schoolchildren not only to present a project, but to take part in the discussion of peer projects.

Thus, it is necessary to develop new programs aimed at developing the interest of schoolchildren and teachers in scientific and research activities, which can become not boring, but interesting and developing.

The importance of social initiatives in the development of master's training is noted by many authors [1-4]. The competition program of the Vladimir Potanin Foundation [5] should also be noted here, within the framework of which a competition is held among teachers of master's programs from 75 universities included in the Vladimir Potanin Scholarship Program. The winners of this competition are recognized experts in their subject area who are able to generate extraordinary ideas, bring them to life and take personal responsibility for the result. These are leaders who unite a team around them, inspire them to achieve a common goal, combine professional and scientific activities with social initiatives.

In [6], it is noted that the social orientation of the magistracy can become a way to break out of everyday life, for a person it can become a new professional and personal step in development with the possibility of new socially oriented ideas about their professional activities. In [7], the authors turn to the problematics of the subject-activity paradigm of modern master's education, which is also associated with a number of problems, the solution of which is socially oriented, affecting the development of the magistracy institution. The authors note that it is important to develop master's programs aimed at a subject ready for self-realization, self-actualization and self-development.

MATERIALS AND METHODS

Project skills: goal-setting, planning, cooperation, presentation and reflection, are formed in adolescents only under favourable conditions in educational activities using active learning technologies in project and group research activities. The reasons for the lack of formation of project activity skills as educational outcomes for students are as follows: in a number of schools, as a rule, a high proportion of students with risks of academic failure; a high
proportion of students with inclusion; low quality of adaptation of migrants, overcoming language and cultural barriers; low educational motivation of schoolchildren; low level of discipline in the classroom [8-10]. At the same time, as a rule, there is a high turnover of teaching staff in the school, there is no systematic extracurricular developmental activity in the subject and in the over-subject plan. These reasons make it impossible to form regulative and communicative universal learning activities without special pedagogical efforts [11].

The Krasnoyarsk Territory is in a cluster with an average educational potential. The number of schools with a low educational result annually in the last 3 years ranges from 400 to 700 [12]. The results of regional diagnostic work on natural science literacy in 2020-2021 (below the baseline - 46.42% of the results) indirectly indicate the inability of students to see problems in reality and translate them into the language of science, and then, solving the subject problem, extrapolate it results on the life situation [13]. All this allows us to conclude that there is no systematic project and research activity in the schools with a low educational result, existing projects are still carried out in schools mostly fictitious or unproductive.

RESULTS AND DISCUSSION

The project "Children's and Youth Science Academy, developed by the authors of the article, is aimed at developing skills in project activities to support children and teachers from schools with poor educational results. Project activity has become an integral part of the modern school curriculum, providing students with the development of those skills that are not in ordinary subjects, giving students the opportunity to try themselves in various fields, find new hobbies and get closer to choosing their path in later life. Project skills allow the school graduate to integrate into the post-industrial economy, where the labour market is developing from the offer of permanent positions to a series of successive projects.

Schoolchildren studying in schools that consistently demonstrate low educational outcomes do not receive the proper development of project skills for two main reasons. Firstly, project activities are considered secondary compared to the workload in the main subjects. Secondly, schools with low educational results are usually characterised by a shortage of talented and motivated teachers or their lack of professional competence.

The project team, which unites a group of teachers of the Pedagogical University, teachers of schools successfully implementing project activities, scientists engaged in scientific work, and NGO workers, intends to create a methodological complex (electronic course and printed manual) on scientific design for students in grades 6-9 and conduct it approbation in the
form of a scientific and practical course with students and advanced training with teachers of schools in the Krasnoyarsk Territory, which are in the category of schools that consistently demonstrate low educational outcomes [14-16].

The logical finale of the project will be the organization of the Children's and Youth Scientific Exhibition-Fair of Schoolchildren's Projects and Research, at which the participants' scientific projects prepared during the training will be presented and evaluated. Schoolchildren from avant-garde groups who have gained positive experience in scientific design will later become leaders of project teams in schools that consistently demonstrate low educational outcomes under the guidance of their teachers who have received methodological training in the project. The original idea of the project is the formation of a peer-to-peer learning environment. In the process of training and project development children from schools with positive design experience will be involved as experts. As a result of the project, the participants will go from the search for an idea to a professional presentation of a finished, "do it yourself" scientific project submitted to the competition, which will be evaluated by an expert community, consisting of both peers and members of the adult professional community.

Today, the project is being tested on the site "Navigator of additional education for children in the Krasnoyarsk Territory". The developed model of the educational program has passed the examination and is included in the personalized financing of additional education program, which gives the right to receive additional educational services at the expense of budget financing.

The system of personalized financing conceptually changes the approach to payment by the state for services rendered to the population, and is a transitional stage towards a social order for the provision of state and municipal services. At this stage of the reform, funds are assigned not to the institution, but to the recipient of services, who himself chooses their provider.

The opportunities for participation in the provision of such services by organizations of the non-profit sector that have a license to educate children and adults will lead to an increase in the efficiency of the work of budgetary and autonomous institutions, the amount of financing of which will now directly depend on their ability to provide the consumer with a quality service at an economically justified price.

Project-based learning continues successfully at the university. Thus, the master's program "Cybernetics and Software Engineering" at the Siberian Federal University, opened with the support of the V. Potanin Foundation, implements a number of project-oriented
courses. In particular, the course "Modern Problems of Cybernetics (in English)", also created with the support of the V. Potanin Foundation, uses many project-oriented technologies. At the same time, experience shows that those students who began to study the project method while still at school are much more successful and easier to master university courses.

The experience of the authors is based on the successful implementation of a number of projects within the competition program of the Vladimir Potanin Foundation. The pool of projects includes the development of a new master's program "Software Engineering and Cybernetics", the development of new online courses such as "Modern Problems of Cybernetics (in English)" and others.

The new master's program "Software Engineering and Cybernetics" was developed and opened within the framework of the direction 09.04.04 - Software Engineering. The uniqueness and relevance of the program is due to the compliance with the priority areas of development of science, technology and technology in the Russian Federation, the list of critical technologies and the requirements of the modern era of digitalization. The project-oriented activity of students is based on methods and models for managing cyber-physical systems, which require the development of real-time software products with the possibility of cross-platform execution. The innovativeness of the approach lies in the implementation of a full cycle of software engineering, bringing development to the level of a software product that has been registered with Rospatent, including the experience of creating small innovative enterprises in the field of software engineering through the commercialization of intellectual property. Students of the program gain skills in preparing publications of the results of projects that are of a research nature in rating journals included in Russian and international citation and analytical databases.

The ability to manage their intellectual property in the form of created software systems, teamwork skills contribute to the active social adaptation of master's graduates to professional activities in the conditions of the modern labour market at the regional, Russian and international levels.

Already today, after the first year of training under the program, one can predict the sustainability and viability of the entrepreneurial infrastructure program in the IT industry and data mining that is being formed by graduates, which shows a significant increase in students' interest in practice-oriented learning and the creation of highly intelligent products that are in demand by the market.
An integral part of the new program was the teaching of some disciplines in English and online support, which ensures the competitiveness of the program in the international market of educational services and expands the geographical scope of its implementation.

One of the new online courses "Modern Problems of Cybernetics (in English)" is intended for undergraduates in the direction 04/09/04 - Software Engineering, a new master's program 04/09/04/03 - Software Engineering and Cybernetics, enrolment for which began in 2021. The course is designed for 2 semesters, with a volume of 144 hours, including 36 hours of contact work with a teacher and 108 hours of independent work.

The aim of the course is to develop the skills of applying the methods of classical cybernetics to the problems of software engineering. The study of the discipline allows masters to develop the competencies necessary for the successful solution of current tasks related to the creation and operation of complex self-adaptable and scalable software systems.

Teaching the course in English allows you to improve the skills of undergraduates in English in the professional field to communicate with foreign colleagues, speak at scientific conferences and seminars, publish articles in rating journals.

Studying the course involves reading and analysing sources on cybernetics in the original, many of which are written by foreign authors - the founders of cybernetics.

Independent work of students in the developed course is based on interactive tasks, which stimulates interest in their passage. Interactive lectures with questions for understanding the material, surveys, test tasks allow students to receive real-time feedback, take the course at a convenient and free time. The Wiki element in the course teaches students how to create group pages in English, similar to website development, which is especially important for undergraduates in software engineering.

Live online communication, on the one hand, allows you to improve your spoken English skills, and, on the other hand, makes it possible to prepare for speaking in English online, to master modern methods of online communication.

**CONCLUSION**

The implementation of project learning will increase the interest of schoolchildren studying at the schools that consistently demonstrate low educational outcomes in project activities, create a course for their training in project preparation. The developed Workbook of the designer will allow each student to choose an interesting topic and prepare a scientific project on it. The preparation of projects will be an incentive for them to master new
information technologies, to acquire additional subject knowledge, as well as the ability to present their projects to a wide audience. The creation of a virtual training laboratory will make it possible to involve schoolchildren from remote schools in the region, who do not have the opportunity of full-time participation in educational projects, in the project. A collection of methodological materials created within the framework of the project will be used to organize a system of additional education for schoolchildren. Teachers will improve their skills in supporting project activities. Graduates of our project will be able to prepare and present their scientific projects at lessons, competitions of various levels.

The experience of the authors shows how important social initiatives are in the development of master's education, which was confirmed by the successful implementation of a number of projects with the participation of students trained in master's programs.

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• III All-Russian scientific conference with international participation "Science, technology, society: Environmental engineering for sustainable development of territories (NTO-III)";

• V Annual Open Regional Online Exhibition-Fair of Schoolchildren's Projects and Scientific Research within the framework of the Year of Cultural Heritage of the Peoples of Russia in the Russian Federation;

• “Industrial Art of Krasnoyarsk. Forgetting cannot be saved!”, a project aimed at preserving and protecting monumental works of industrial art.

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