

The System of Supplementary Education as an Instrument of Developing Students' Readiness for Creative Profession-Oriented Activity

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ABSTRACT

The author has developed a model of students' readiness for creative activity in the system of supplementary education using her long-term experience in this area. In the absence of sound scientific principles of applying project technology in mass educational practice, she has conducted a thorough job aimed at analyzing the way of establishing children's technical creativity in Russia. Students' readiness for creative profession-oriented activity enables them since early childhood to be professionally oriented and to get ready for a rapidly changing world and scientific-technical progress. The specificity of project activity within learning-sectoral clusters in the system of supplementary education is in their crucial influence on students' professional self-determination and their future career. It is shown that choosing the subject of the project is of great importance for an individual because it involves an interest both in the type of activity and the project object. Existing pedagogical conditions and their realization enabled the author to develop and implement the theoretical model of building students' readiness for creative profession-oriented activity. The tests carried out to identify the levels of students' readiness for creative profession-oriented activity have demonstrated that the theoretical model and the innovative technology under discussion can double the number of students in the experimental group conducting creative projects at a high level as compared with the students in the test group. Results of pilot studies are given which prove efficiency and usefulness of innovative learning technology.

Key words: *supplementary education, children's creativity, project technology, theoretical model*

1. INTRODUCTION

The history of children's technical creativity goes back a long way. In the slave-owning era, all physical labor was the preserve of slaves and was therefore considered despicable. During the Middle Ages, crafts were identified with the arts and a mystical tradition of sanctity, wisdom and secret, which was the core of the society's working morality, was associated with crafts. In the system of workshop apprenticeship, the medieval master transferred knowledge from mouth to mouth, which was accompanied by the transmission of his/her individuality. With the development of science, technology and capitalist relations, attitudes towards handicrafts and professional work and even the large-scale involvement of children and teenagers in labor activities were changing. The starting point for establishing the system of supplementary education in Russia is the year 1922, when the pioneer organization was founded. Along with industrialization children's modeling was intensively developed (plane,

ship and motor car modeling, etc.). In 1939, Soviet young technicians debuted their models at an international exhibition in the United States. During the Great Patriotic War students of young technicians' centers carried out war orders and made products for home front; in the post-war period they were acquiring special technical knowledge and skills. Since 1960s, the focus has been on children's technical creativity; school circles and technical clubs at Houses of Pioneers have been organized with the aim to develop creative attitude to work, comprehensive and harmonious personality development, building children's capacities for creative activity in the field of technology [1]. At present, all circles and technical creativity centers belong to the system of supplementary education. Nevertheless, their essence remains the same – a strong orientation of educational systems towards preservation and reproduction of the society's professional potential, realization of the individual's self-determination and bringing out the child's creative potential [1].

The relevance of the research should be seen in two aspects of its purpose.

The first, extremely important aspect of the relevance in the project activity is developing student's creative thinking and scientific potential through free choice of the subject and content of the project, free planning and scheduling, alternative materials for making parts and aggregates of the object to be designed, non-traditional parts and units handling, using innovative energy sources to move and operate a technical object, etc.

Another equally important aspect of the relevance concerning the problem under consideration is deepening or broadening of the orientation in the area of technical professions and development of early professional self-determination. In the absence of hard and fast standards regulating the learning-sectoral cluster (circle), through free choice of the design topic as well as application of materials and tools used in the specific industry it is possible to study characteristic features of engineering within profession-oriented activity of institutions of supplementary education.

At present in Russia there are several thousand organizations implementing educational programs for children. To achieve the objectives in supplementary education methods and technologies of project activity are widely used. At the Children's Creativity Center "Raduga uspekha (Rainbow of success)" of the Samara district creative and learning-cognitive activity is organized in the form of creative projects carried out by students.

2. METHODOLOGY

Activity in the system of supplementary education is realized on the project technology that incorporates the project method suggested by John Dewey and actively used in pedagogy [2] as well as on the principles of Célestin Freinet's "free work" method [3]. Methodological foundation of the "free work school" is based on nature-oriented, democratic and practice-oriented approach to education and upbringing of students [4].

The important feature of using the abovementioned technologies, methods and principles is opportunity to enrich the learning process, to make it technological, pragmatic [5], oriented on students' independent individual activity.

By definition, the objects to be designed are chosen according to the industry or technology selected by the student: plane modeling, ship modeling, robotics, motor car modeling, graphics and fine arts, knitting and sewing modeling in accordance with the student's individual interest and vocational wishes.

In pedagogical practice every project is seen as a research work [6]. It can be planned for several hours, months and even years and developed both collectively and individually by students and teachers. The project can take various forms: role-play game, contests, video and TV programs, staging, traveling, exhibitions, etc. [7].

Unfortunately, these days many students fail to use measurement instruments, tools for sawing, stroking,

whacking etc. At the same time, practically everybody is familiar with the elements of LEGO, which are used to hold various competitions and contests ("Sumo", "Kegekring", "Robofootball", etc.) [8]. These events impress the child and allow him/her to express himself/herself creatively, develop a program and create something he/she has not yet seen or done. It goes without saying that creativity is not always discovery of unique scale; at the initial stage this is self-discovery or discovery of something that the student has not yet known [9].

A student gives his/her own preference to a certain activity; tutors (teachers in charge of the industrial cluster/circle) should be very tactful supervising students' work [10]. After the topic of the project is approved, the student with the teacher draw up the educational route specifying the amount of time needed to implement the project (free time from the student's regular schedule and other interests is taken into account) as well as methods, techniques, instruments, materials, etc. to be used to make the chosen object. The specificity of technical creativity centers is that manual labor is preferred [11]. The essence of manual activity is much broader as compared with creating a certain material object; it is based on tactual sensations, fine motor skills and is expressed in the following functions: manipulation to regulate mental activity and establish object-social relationships; acquiring new knowledge and skills to study environment through objects; creation with the aim to produce a specific object on the basis of the subjective image. The functions mentioned above determine the intellectual, spiritual and moral development of the student's personality [12].

Making the object of the specific cluster (circle) the students get an understanding of relevant fields of technology, physical foundations of technical device operation, materials used, design calculation methods, structural concepts used in engineering. They also acquire practical skills when carrying out calculation, drawing, adjustment and finishing as well as selecting materials and their technical treatment [13].

To build students' readiness for creative profession-oriented activity the author suggests a theoretical model which is a structural composition consisting of nine interrelated units ranging from the goal-setting unit to the results of students' developed readiness for creative profession-oriented activity. Unit one – goal-setting – is to form students' readiness for creative profession-oriented activity. Unit two involves choosing topics and content of the creative projects selected by the students independently according to their own interests, needs, abilities; the topics and content are to comply with technical and information-didactical capacities of the technical creativity centers within the system of supplementary education. Unit three includes project technology of the activity used to build students' readiness for creative profession-oriented activity at the creativity center of supplementary education. Unit four refers to the criteria and diagnostic tools to assess the level of students' readiness for creative profession-oriented activity. Unit five involves the subjects of the educational process

(students belonging to a certain technical circle of the technical creativity center). Unit six means control procedure where two outcomes may be achieved:

- if the level of a student's readiness for creative profession-oriented activity is consistent with the established requirements, the results are recognized as positive (Unit nine);
- if the level of a student's readiness for creative profession-oriented activity is low, he/she is to carry out self-correction, i.e. work harder to achieve the desired goal (Unit seven).

In case majority of students fail to achieve the desired goal, it is necessary either to correct the technological process or to improve organizational and methodological support (Unit eight) [14].

3. RESULTS

To identify the levels of students' readiness for creative profession-oriented activity one-year summative and three-year formative experiments were conducted; 161 respondents participated in these experiments.

The students were divided into two groups: a test group and an experimental one. The students belonging to the test group were taught according to the traditional technology of acquiring skills, whereas the experimental group were taught in accordance with the innovative project technology described above. During the summative experiment the students of both groups were tested to identify the initial level of their readiness for creative profession-oriented activity. During the formative experiment the students were to do the tests according to each component of readiness. Every test contained ten question; each indicator was rated on a scale of 1 to 10. The panel of experts included the head of the circle, two teachers and the head of the technical creativity center. The resulting score for each component is taken as the average of expert estimates.

The usefulness of innovative project technology is confirmed by the following didactic and socially significant results: for three years, the number of students of the experimental group conducting creative projects at an enhanced level according to the developed innovative technology has grown by 1.5. times; as compared with the students of the test group the number of students performing creative projects at a high level has doubled.

For illustration we will present the results of achievements of students of the Children's Technical Creativity Centre "The Rainbow of Success" in the form of histogram for the three-year period of using the innovative project technology in the educational process. The data of social and expert recognition presented in picture 1 prove the efficiency of the conducted experiment in the 2016-2020 academic period.

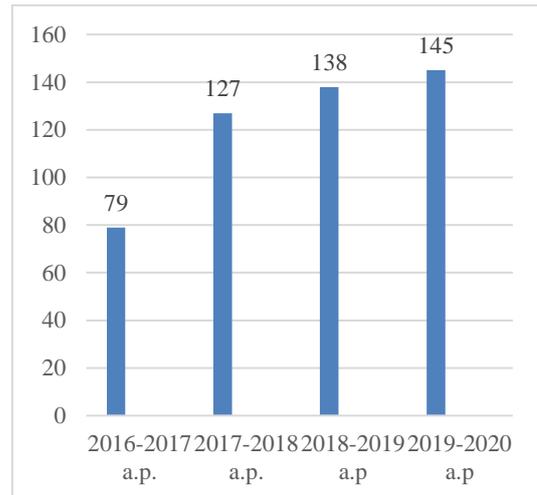


Figure 1 Students' achievements in the course of the experiment

The academic years (2017-2020) of the pilot study as well as the 2016-2017 academic year are indicated on the horizontal axis. The vertical axis shows the number of awards won by the students in the course of the experiment. It should be noted that these are top places in All-Russian, international, municipal, regional creative contests and competitions. In the 2016-2017 academic year top places were granted to the students taught without using innovative project technology described above.

4. CONCLUSIONS

The pedagogical experiment under consideration confirmed appropriateness of choosing the innovative creative technology designed in accordance with the theoretical model aimed at achieving the desired goal and used in the educational process of the technical creativity center. In other words, the system of supplementary education proves its efficiency in preparing students for creative profession-oriented activity.

The results of the investigation can be recommended for application in other institutions of supplementary education [15].

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The main provisions of the study, conclusions and recommendations (theoretical and practical) was tested and used in the municipal budget institution of additional education: children's creativity Center "rainbow of success", the

children's creativity Center "Master plus", Center of technical creativity "Integral" of Samara city district, as well as in state budgetary educational institution of the Samara region secondary school №2 "Educational centre" C. Kinel ' -Cherkassy municipal district Kinel-Cherkassy Samara region. These organizations also show positive dynamics of students' performance in competitive events by 10.3%, 12.4% and 9.8%, respectively.

The results were reported and discussed at the IX International RPC "Science and education of the future" (Samara, 2016); 11 international RPC "Continuing professional education as a factor of sustainable development of the innovative economy" (Kazan, 2017); IV RPC with international participation "Modern technologies for training and advanced training of oil and gas production specialists" (Samara, 2017); I V All-Russian scientific and practical conference with international participation. Participation. "New word in science: development strategies" (Cheboksary, 2018); I V International scientific conference "education: past, present and future (Krasnodar, 2018). The research results were presented in articles of scientific journals: international scientific and practical journal "World of pedagogy and psychology" (Nizhny Novgorod, 2018), "Actual problems of innovative pedagogical education" (Kazan, 2018), Young scientist (Kazan, 2019), including in journals reviewed by the higher school of Economics: Samara scientific Bulletin (2017), Kazan science (2017), Pedagogical education of Russia (2018), Kazan pedagogical journal (2020).

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